



CURO
Center of Undergraduate Research Opportunities

Symposium 2008



March 31, 2008

**Classic Center
Athens, Georgia**

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

2008 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: Center for Teaching & Learning

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Symposium Chair:

Dr. Pamela B. Kleiber

Edited and proofread by:

Rebecca Cheney, Sarah Craven, Matt First, David Porcaro

Cover design:

Dorothe Otemann

Cover art:

The People by Adam Gruszynski, Ceramics and Photography Major, Lamar Dodd School of Art, University of Georgia

Published by:

Honors Program, University of Georgia

Printed by:

Central Duplicating, University of Georgia
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Center for Undergraduate Research Opportunities

CURO

Symposium 2009

University of Georgia
Classic Center, 300 N. Thomas Street
March 30, 2009

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 and a brief supporting letter from the sponsoring faculty member via the CURO web site no later than January 16, 2009. 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 27, 2009, 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 13, 2009 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. 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, (706) 542-5871.

☞ *Symposium At-A-Glance* ☜

Monday, March 31, 2008

Begin registration of oral and poster presenters; Students hang up posters Classic Center, Lobby	8:00 a.m.
Concurrent Oral Sessions Classic Center, Athena Breakout Rooms A, B, C, D, G, H, I, J	10:10 a.m.
Concurrent Oral Sessions Classic Center, Athena Breakout Rooms A, B, C, D, G, H, I, J	11:15 a.m.
Concurrent Oral Sessions Classic Center, Athena Breakout Rooms C, D, G, H, I, J	12:20 p.m.
Concurrent Oral Sessions Classic Center, Athena Breakout Rooms C, D, G, H, I, J	1:25 p.m.
Creative Writing & Music Classic Center, Athena Ballroom E	1:25 p.m.
Concurrent Oral Sessions Classic Center, Athena Breakout Rooms G, H, I, J	2:30 p.m.
Welcome and Opening Session Classic Center, Athena Ballroom E	4:00 p.m. Dr. David S. Williams Director, Honors Program
The Value of Undergraduate Research	Dr. David C. Lee Vice President for Research
Recognition of CURO Promising Scholars	Dr. Pamela B. Kleiber Associate Director, Honors Program
Introduction of Keynote Speaker	Ashley L. Foster Honors Program student and CURO Scholar
Keynote Address: “Global Climate Change and Georgia: The Challenges Are Mounting”	Dr. James Porter Josiah Meigs Distinguished Teaching Professor Eugene Odum School of Ecology
Announcement of Excellence in Undergraduate Research Mentoring Awards	Prof. Jere Morehead Vice President for Instruction
Poster Session & Reception Classic Center, Athena Ballroom F	5:00 p.m.

∞ Symposium At-A-Glance ∞

CURO Apprentice & Promising Scholars Dinner
Olympia Rooms

6:15 p.m.

Art Gallery Talks
Classic Center, Fire Hall

6:15 p.m.

Dr. Pamela B. Kleiber
Associate Director, Honors Program
Prof. Georgia Strange
Director, Lamar Dodd School of Art
Ms. Nora Wendl
Gallery Director, Lamar Dodd School of Art

**Announcement of CURO Summer Research
Fellows, CURO Scholars, UGA Libraries
Undergraduate Research Awards,
and Best Paper Awards**
Classic Center, Fire Hall

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 Electronic Library
Ms. Deborah Dietzler
Executive Director, UGA Alumni Association

Monday, March 31, 2008

Concurrent Oral Sessions

Classic Center, Athena Breakout Rooms A, B, C, D, G, H, I, J

10:10 – 11:00 a.m. First Concurrent Session

Room A	Rachel Dolan	Two Faced Politicians: Political Supply versus Constituent Demand in Health Rationing Policy
	Faculty Mentor	Dr. Anthony Bertelli, Department of Public Administration & Policy
	Amy K. Winter	HIV/AIDS in India: A Case Study on the Influence of Traditional and Modern Indian Characteristics on the HIV/AIDS Epidemic among Indian Youth
	Faculty Mentor	Dr. Dr. Nan McMurry, Department of History
	Catherine P. Mencher	The Case for Minor Access to Emergency Contraceptive
	Faculty Mentor	Dr. Monica Gaughan, Department of Health Policy & Management
Room B	Cain Harrelson	The Diplomatic Face of America: Promoting Diversity in the U.S. Foreign Service
	Faculty Mentor	Dr. Kaye Sweetser, Department of Advertising & Public Relations
	Rachel A. Spencer & Sarah Vaughn	"In the Shadows of Espionage": Extraordinary Rendition as a Threat to American National Security
	Faculty Mentor	Dr. Loch Johnson, Department of International Affairs
	Alexander B. Johnson	The U.S. Intelligence Community Must Become Centralized
	Faculty Mentor	Dr. Loch Johnson, Department of International Affairs
Room C	Ashley A. Wilkinson	Determining the Truth: The War on Terror and Repression in China
	Faculty Mentor	Dr. David S. Williams, Honors Program
	John T. Dixon	U.S.-China Energy Cooperation: A Step toward Greater Environmental Cooperation
	Faculty Mentor	Dr. Rhett Jackson, Department of Forestry
	Aaron M. Sayama	A Feasible Trilateral Agreement: A Convergence of Interests
	Faculty Mentor	Dr. Dr. Seema Gahlaut, Center for International Trade & Security

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Room D	Robert Rosenbleeth & Rocky T. Cole Faculty Mentor	Avoiding Overcorrection: Solving the Army's Readiness Crisis Dr. Patricia Sullivan, Department of International Affairs
	William Patrick Dever Faculty Mentor	Reforming Subsidies in the Federal Budget Dr. William Lastrapes, Department of Economics
	Karen E. Tanenbaum Faculty Mentor	Diversity and State-Building: A Cross-Country Analysis of the U.S. and Canada Dr. Christopher Allen, Department of International Affairs
Room G	Lillie Ann M. Madali Faculty Mentor	The Joys of Hunting: Analyzing the Relationship between the Small Hunt Mosaic of Piazza Armerina in the Architectural Space of the Hiemale Triclinium Dr. Asen Kirin, Department of Art History
	Jason E. Dyer Faculty Mentor	A Domitianic Predecessor to the Arch of Constantine? Prof. James Anderson, Jr., Department of Classics
	Stefann S. Plishka Faculty Mentor	George Washington and Abraham Lincoln: Relic Veneration and "Saint" Commemoration in Contemporary America Dr. Asen Kirin, Department of Art History
Room H	Cleveland A. Piggott Faculty Mentors	The Role of Microtubules in the Formation and Degradation of Hirano Bodies Dr. Marcus Fechheimer, Department of Cellular Biology Dr. Ruth Furukawa, Department of Cellular Biology
	Tulsi Patel Faculty Mentor	Generating Uniform Proliferation of Neuroprogenitor Cells Dr. Steven Stice, Department of Animal & Dairy Science
	Neil T. Pfister Faculty Mentor	Characterizing RNA-Protein Complexes in <i>Pyrococcus furiosus</i> Dr. Michael Terns, Department of Biochemistry & Molecular Biology
Room I	Joshua A. Dunn Faculty Mentor	Roswell Voices: Oral History and Linguistics in Roswell, Georgia Dr. Dr. William Kretzschmar, Department of English and Department of Linguistics
	Jana M. Hanchett Faculty Mentor	Hispanic Music in Athens, Georgia Dr. David Schiller, Department of Musicology & Ethnomusicology
	Andrew C. Clark Faculty Mentor	French Dislocation: The Syntax of Power Dr. Diana Ranson, Department of Romance Languages

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Room J	Darryl Tricksey & Dakia McCray Faculty Mentors	African-American Models of Success Dr. Victoria Plaut, Department of Psychology Dr. Larry Nackerud, School of Social Work
	Erica Holland Faculty Mentor	The N-Word and Its Implications on a Predominately White Campus Dr. Robert Pratt, Department of History
	Jennifer L. Barr Faculty Mentor	Examining Parenting Stress for Mothers of Young Children with Autism Spectrum Disorders Dr. Dr. Jonathon Campbell, Department of Educational Psychology & Instructional Technology

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

Room B	Shelby R. Carlson, Holly Chandler, Heather Smith & Rebecca Lewis Faculty Mentor	Emotional and Behavioral Problems Displayed in Preschoolers Raised by Biological Grandchildren Dr. Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University
	Nicole M. Fenton & Emily Osborn Faculty Mentor	The Impact of Family Relations, Health Perceptions, and Parental Functioning on Adherence and Medical Outcomes in Adolescent Transplant Recipients Dr. Ronald Blount, Department of Psychology
	Ashley A. Wilkinson Faculty Mentor	Ending the Waiting List Crisis: Increasing Child Care Subsidy Funds Dr. Thomas McNulty, Department of Sociology
Room C	Halina Maladtsova Faculty Mentor	Eliminating the Road Test in License Renewal Programs Dr. Christopher Cornwell, Department of Economics
	Lila E. Tedesco Faculty Mentor	Mixed Income Housing: A Comprehensive Reconstruction Plan for New Orleans Dr. Andrew Carswell, Department of Housing & Consumer Economics
	Terry L. Palmer Faculty Mentor	Reducing and Rethinking Recidivism Dr. Mark Cooney, Department of Sociology
Room D	Lauren F. Kelly Faculty Mentor	<i>Eres un Universo de Universos: Reconnecting With the Human Aspects of Medicine Through Field Experiences on La Isla de Ometepe</i> Dr. Pamela B. Kleiber, Honors Program

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	Lee Ellen Carter	Otavaleños and Cotacacheños: Local Perceptions of Sacred Sites for Farmscape Conservation in Highland Ecuador
	Faculty Mentor	Dr. Fausto Sarmiento, Department of Geography
	Adam Thomas	Perceptions of Puerto Rican Women and Their Impact on Public Health Policy in the Early 20th Century
	Faculty Mentor	Dr. Reinaldo Román, Department of History
Room G	Brian T. Laughlin	Functional Analysis of the <i>Magnaporthe grisea</i> Secretome
	Faculty Mentor	Dr. Sheng-Cheng Wu, Complex Carbohydrate Research Center
	Matthew C. Agan	Epistasis for Fitness among Biosynthesis Genes in Yeast
	Faculty Mentor	Dr. David Hall, Department of Genetics
	Amy J. Burrell	Transcriptional Expression of Arabidopsis GAUT Genes: 15 Proven and Putative Plant Cell Wall Biosynthetic Galacturonosyltransferases
	Faculty Mentor	Dr. Debra Mohnen, Complex Carbohydrate Research Center
Room H	Erika D. Frank	La Voz de los Sin Voz: The Use of Radio by the Zapatista Movement in Mexico
	Faculty Mentor	Dr. Pamela Voekel, Department of History
	Lucas L. Puente	The Importance of American Development Aid in Nicaragua
	Faculty Mentor	Dr. Santanu Chatterjee, Department of Economics
	Clare J. Hatfield & Maggie Mills	The Road to Violence: Nonviolent v. Violent Actors in Bangladesh
	Faculty Mentor	Dr. Mia Bloom, Department of International Affairs
Room I	Prashant Monian	Expression of Glycerophospholipids in Rat Brain after Cocaine Withdrawal
	Faculty Mentor	Dr. Brian Cummings, Department of Pharmaceutical & Biomedical Sciences
	Steven P. Trau	IS492 Movement on the <i>Pseudoalteromonas atalantica</i> Chromosome
	Faculty Mentor	Dr. Anna Karls, Department of Microbiology
Room J	Jessica N. Van Parys	Does Writing Ability Predict Academic Achievement? Evidence from the New SAT Writing (SATW) Section
	Faculty Mentor	Prof. David Mustard, Department of Economics
	Ashley A. Babcock	The Engineering Learning Environment
	Faculty Mentor	Dr. Nadia Kellam, Department of Biological & Agricultural Engineering

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**Mary K. Holder,
Marcia A. Cole,
Bette' S. Ford &
Destiny L. Murray**
Faculty Mentor

Solving Rubik's Cube: Artificial Selection in Higher Education
Dr. Farooq Khan, Department of Chemistry, University of West Georgia

12:20 – 1:10 p.m. Third Concurrent Session

Room C

Mia Catherine Morgan
Faculty Mentor

Potential Economic Impact from Zeolite Use in Uganda
Dr. William Kisaalita, Department of Biological & Agricultural Engineering

**Ellyn A. Echols
& Jeremy Akin**
Faculty Mentor

Rethinking the U.S.'s Relationship with the Global Poor: A Restructuring of USAID's Microfinance Efforts in Africa
Dr. Glenn Ames, Department of International Public Service & Outreach

Alex Kazer
Faculty Mentor

Hope for the Horn: The Case for the Recognition of Somaliland
Dr. Abdulahi Osman, Department of International Affairs

Room D

Sharanya Raghunath
Faculty Mentor

Characterization of Human Stem Cells Using Quantitative RT-PCR
Dr. Kelley Moremen, Department of Biochemistry & Molecular Biology

Laura J. Simpson
Faculty Mentor

The Naturally Attenuated TCC Strain of *Trypanosoma cruzi* Induces a Specific CD8+T Central Memory Response
Dr. Rick Tarleton, Department of Cellular Biology

Room G

Rebecca I. Lunceford
Faculty Mentor

Tort Cases in Georgia in the Early 2000s: Tort Abuse Not as Prominent as Portrayed
Prof. David Mustard, Department of Economics

Karen C. Wong
Faculty Mentor

Regional Comparison of the Legal Basis of Venture Philanthropy
Dr. Andrew Whitford, Department of Public Administration & Policy

Meghan A. Royal
Faculty Mentor

The Impact of Chinese Product Fraud and Lack of Quality Control on U.S. Commercial Trade Laws and Regulations
Prof. Marisa Pagnattaro, Department of Legal Studies

Room H

James T. Gordy
Faculty Mentor

Characterizing the Small Proteome in the Hyperthermophilic Archaeon *Pyrococcus furiosus*
Dr. Michael Adams, Department of Biochemistry & Molecular Biology

⌘ Program ⌘

	Kathryn S. Flake	Cloning, <i>E. coli</i> expression, and HPLC Enzymatic Assay Analysis of Putative Domains of Arabinose Kinase
	Faculty Mentor	Dr. Maor Bar-Peled, Complex Carbohydrate Research Center
Room I	Delila D. Wilburn	Black Women and the Movements: Using Art to Re-Define Beauty
	Faculty Mentor	Dr. Barbara McCaskill, Department of English
	Traci N. Tucker	A Cross-Cultural Comparison of Gender and Role-Identities in China and the United States
	Faculty Mentor	Dr. Dawn Robinson, Department of Sociology
	Matthew G. Anderson, Lindsay Bailey, Christopher Newberry & Jimmie Flower	The Influence of Family Structure on Aggression Displayed in Young Head Start Children
	Faculty Mentor	Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University
Room J	Laura C. Patterson	The Application and Adaptability of N.A. Rimsky-Korsakov's Orchestration Techniques Across National Styles in Orchestral Program Music
	Faculty Mentor	Dr. David Haas, Department of Musicology & Ethnomusicology
	Tyler L. Kelly	Usage of Linear Subspaces with Varieties
	Faculty Mentor	Dr. Elham Izadi, Department of Mathematics
	Caroline M. Anderson	A Psychological View of Wolf/ Mörike's Peregrina Songs
	Faculty Mentor	Dr. Max Reinhart, Department of Germanic & Slavic Languages

1:25 – 2:15 p.m. Fourth Concurrent Session

Room C	Robert M. Truan	Antonio Vivaldi's Contribution to the Evolution of Program Music
	Faculty Mentor	Dr. Susan Thomas, Department of Musicology & Ethnomusicology and Institute for Women's Studies
	Victor M. Orellana	The Homeric Lineage of Lautaro in Ercilla's <i>La Araucana</i>
	Faculty Mentor	Dr. Nicolás Lucero, Department of Romance Languages
Room D	Kevin K. Chang	Improving the Health of Georgia Youth: An Incentive Program for Nutritional Standards in Georgia Schools
	Faculty Mentor	Dr. Phaedra Corso, Department of Health Administration, Biostatistics & Epidemiology

Program

	Lauren M. Lesso, Susan Hulteen, Christopher Newberry, Kim Mears, Christina Borne & Alex Carson	The Impact of Low Income Families on the Development of Literacy
	Faculty Mentor	Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University
Room G	Tyler B. Pratt	The Global Arms Bazaar: Lessons from the 2006 Hezbollah-Israel War
	Faculty Mentor	Dr. Michael Jasinski, Department of International Affairs
	Nathaniel T. Edwards	Increasing Trade Security: United States-Venezuelan Trade Incentives
	Faculty Mentor	Dr. Christopher Allen, Department of International Affairs
	Chris Chiego	Managing U.S. Aid to Egypt: A Reorientation of Current Support
	Faculty Mentor	Dr. Brock Tessman, Department of International Affairs
Room H	Jessica L. Mobley	Is a Hepatitis E-Like Virus Found In Cats and Does It Cause Hepatitis?
	Faculty Mentor	Dr. Elizabeth Howerth, Department of Pathology
	Jessica L. Buday	Charcoal-Powered Vacuum-Zeolite Adsorption Cooler Regenerator for the Preservation of Milk, Vaccines, and Other Perishables
	Faculty Mentor	Dr. William Kisaalita, Department of Biological & Agricultural Engineering
	Natasha A. James	The Ecology of Enteric Bacterial Isolates in San Luis, Costa Rica
	Faculty Mentor	Dr. Susan Sanchez, Department of Infectious Diseases
Room I	Sarah R. Breevoort	Towards the Discovery of Ras-Converting Enzyme Inhibitors-A Novel Anti-Cancer Target
	Faculty Mentor	Dr. Walter Schmidt, Department of Biochemistry & Molecular Biology
	Claire M. Rice	In Vitro Assay to Measure Cell Growth and Invasion
	Faculty Mentor	Dr. Bruce LeRoy, Department of Pathology
	Nithya M. Natrajan	The Roles of Non-homologous End Joining Repair Proteins in Non-B-DNA Structure Induced Genetic Instability
	Faculty Mentors	Dr. Karen Vasquez, Department of Carcinogenesis, University of Texas Dr. Mary Bedell, Department of Genetics

⌘ Program ⌘

Room J	Anna E. Hudson	Using Surface Enhanced Raman Spectroscopy for the Detection of Pathogens
	Faculty Mentor	Dr. Richard Dluhy, Department of Chemistry
	Matthew Logan Davis	Long-Range Retrograde Transduction of Survival Signals in Neurons
	Faculty Mentor	Dr. James Franklin, Department of Pharmaceutical & Biomedical Sciences
	Anita C. Randolph	Functionality of Glutamate Receptors in hESC-derived Neural Progenitors vs. Matured Neurons
	Faculty Mentor	Dr. Steven Stice, Department of Animal & Dairy Science

1:25 – 3:20 p.m. Creative Writing & Music

Classic Center, Athena Ballroom E

Jordan A. Dalton	<i>Room–Poem</i>
Faculty Mentor	Prof. Andrew Zawacki, Department of English
Soujourner Hodges	<i>Book of Trees</i> (selections)
Faculty Mentor	Dr. Adrian P. Childs, Department of Music Theory & Composition
Brandon Kaufman & Kim Nogi	<i>Duet of Soprano and Bass Clarinet</i>
Faculty Mentor	Dr. Roger Vogel, Department of Music Theory & Composition
Brian Graiser	<i>Sketches in Noir</i> (selections)
Faculty Mentor	Dr. Leonard V. Ball, Jr., Department of Music Theory & Composition
Bulldog Brass Quintet: Tommy Cox, Josh Cutchin, Cathy Kilroe-Smith, Chris Probst, Aaron Ritter & Brad Whitfield	<i>Contemporary Brass Sounds</i> (selections)
Faculty Mentor	Prof. Fred Mills, Director & Department of Brass
Opera Ensemble: Jason Blanton, Ben Dawkins, Andrew Frazier, John Ford, Danielle Granati, Kathryn Sabol, Ronaldo Steiner, Megan Tucker, Kristen Vanderoeff, Brett Vogel, Katherine Walters & Chloe Zeitounian	<i>From Page to Stage</i>
Faculty Mentors	Prof. Frederick Burchinal, Director & Department of Voice Prof. Gary DiPasquasio, Pianist/Music Director & Department of Voice

Program

2:30 – 3:45 p.m. Fifth Concurrent Session

Room G	Ashley A. Bowen	Are We Really Ready? The Need for National Standards and the Creation of the Cycle of Emergency Planning
	Faculty Mentor	Dr. Brock Tessman, Department of International Affairs
	Nicole C. DeMarco & Aqsa Mahmud	Emergency Response: Bringing it to Georgia
	Faculty Mentor	Dr. Michael Beck, International Center for Democratic Governance
	Kelsey A. Jones	You Are What You Eat: Mandating Point-of-Purchase Nutrition Information in Georgia Restaurants
	Faculty Mentor	Dr. Marsha Davis, Department of Health Promotion & Behavior
Room H	Michael D. Mogill	Oxygen Delivery After Ischemia in Active and Inactive Subjects
	Faculty Mentor	Dr. Kevin McCully, Department of Kinesiology
	Yen Tran	Comparison of the Acute Toxicity of Selective Serotonin Reuptake Inhibitors (SSRIs) and St. John's Wort (<i>Hypericum perforatum</i>) to <i>Ceriodaphnia dubia</i>
	Faculty Mentor	Dr. Marsha Black, Department of Environmental & Health Sciences
	Kimberley L. DeLisi	The Effect of Sample Handling and Storage on the Accuracy and Repeatability of Fecal Worm Egg Counts in Horses
	Faculty Mentor	Dr. Ray Kaplan, Department of Infectious Diseases
	Christina L. Faust	Environmental Factors Affecting the Persistence of Avian Influenza Virus in Water
	Faculty Mentor	Dr. David Stallknecht, Department of Wildlife Disease Study
Room I	Leilah D. Zahedi	Permeability of Intestinal Cells Exposed to Black Walnut Extract
	Faculty Mentor	Dr. David Hurley, Department of Population Health
	Seychelle M. Vos	Sequencing and Tissue Distribution of Toll-Like Receptor 3 in White-tailed Deer
	Faculty Mentor	Dr. Elizabeth Howerth, Department of Pathology
	Robert D. Bennett	Can Smallholder Dairy Farmers of Southwestern Uganda Save Their Evening Milk?
	Faculty Mentor	Dr. William Kisaalita, Department of Biological & Agricultural Engineering

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	Aaron O. Watwood	Design Evolution of Non-Electric Evaporative-Cooling Milk Container for Smallholder Farmers in East Africa
	Faculty Mentor	Dr. William Kisaalita, Department of Biological & Agricultural Engineering
Room J	Sean P. Durning	Antibody Extraction
	Faculty Mentor	Dr. Lance Wells, Department of Biochemistry & Molecular Biology
	Ashley L. Foster	Voltage-Dependent Anion Conductance (VDAC) Porin: A Possible Channel for Cytochrome c Release in Apoptosis
	Faculty Mentor	Dr. James Franklin, Department of Pharmaceutical & Biomedical Science
	Purvi S. Sheth	Characterization of <i>Mycobacterium shottsii</i>
	Faculty Mentor	Dr. Russell Karls, Department of Infectious Diseases

4:00 p.m. Welcome and Opening Session

Classic Center, Athena Ballroom E

Welcome	Dr. David S. Williams, Director, Honors Program
The Value of Undergraduate Research	Dr. David C. Lee, Vice President for Research
Recognition of CURO Promising Scholars	Dr. Pamela B. Kleiber, Associate Director, Honors Program
Introduction of Keynote Speaker	Ashley L. Foster, Honors Program student and CURO Scholar
Keynote Address <i>Global Climate Change and Georgia: The Challenges Are Mounting</i>	Dr. James Porter Josiah Meigs Distinguished Teaching Professor, Eugene Odum School of Ecology
Excellence in Undergraduate Research Mentoring Awards	Prof. Jere Morehead, Vice President for Instruction

5:00 p.m. Poster Presentations and Reception

Classic Center, Athena Ballroom F

Kyle F. Abramowicz	Aggressive Behavior and Prezygotic Isolation in <i>Drosophila persimilis</i> and <i>D. pseudoobscura</i>
Faculty Mentor	Dr. Wyatt Anderson, Department of Genetics

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Ashley A. Babcock Faculty Mentor	The Engineering Learning Environment Dr. Nadia Kellam, Department of Biological & Agricultural Engineering
Robert D. Bennett Faculty Mentor	Can Smallholder Dairy Farmers of Southwestern Uganda Save Their Evening Milk? Dr. William Kisaalita, Department of Biological & Agricultural Engineering
Andrew D. Bosson Faculty Mentor	The Role of Rif1 in <i>Kluyveromyces lactis</i> Telomere Maintenance Dr. Michael McEachern, Department of Genetics
Emily Dale Broder Faculty Mentors	Forced Copulation and Offspring Viability in <i>Drosophila melanogaster</i> Dr. Wyatt Anderson, Department of Genetics Dr. Yong-Kyu Kim, Department of Genetics
Nancy D. Brynteson Faculty Mentor	"I Want My Credits!": The Impact of Procedural and Interactional Injustice on Participants' Evaluations of an Experimenter Dr. Alicia Bembenek, Department of Psychology, Georgia College & State University
Jessica L. Buday Faculty Mentor	Charcoal-Powered Vacuum-Zeolite Adsorption Cooler Regenerator for the Preservation of Milk, Vaccines, and Other Perishables Dr. William Kisaalita, Department of Biological & Agricultural Engineering
Joseph S. Burch Faculty Mentor	Characterization of Mitoferrin and Its Interactions with Ferrochelatase Dr. Harry Dailey, Biomedical & Health Sciences Institute
Jean Chi Faculty Mentor	Evaluating Protocols for Measuring Immune Defenses in Larval Monarch Butterflies Dr. Sonia Altizer, Eugene Odum School of Ecology
Eric P. Cho Faculty Mentor	Contours and Melting Crystals Dr. Robert Varley, Department of Mathematics
Caroline G. Colden Faculty Mentor	Nipah Virus and Apoptosis in Cells Dr. Corrie Brown, Department of Pathology
Benjamin P. Crane Faculty Mentor	Physical and Structural Basis for pH Dependence of Transcription Regulation by the Anti-Sigma Factor AsiA Dr. Jeffrey Urbauer, Department of Biochemistry & Molecular Biology
Vanessa N. del Valle Faculty Mentor	The Role of Insulin-Induced Tyrosine Phosphorylation on O-GlcNAc Transferase (OGT) Dr. Lance Wells, Department of Biochemistry & Molecular Biology

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Melissa D. Docampo Faculty Mentor	Metabolic Studies in <i>Toxoplasma gondii</i> Dr. Boris Striepen, Department of Cellular Biology
Andrew M. Durso Faculty Mentor	Cataloging Biodiversity: Filling in the Gaps for Coastal Ecuadorian Herpetofauna Dr. Paul Hamilton, Department of Biological Sciences
Jessica E. Dyke Faculty Mentor	Sex-Related Differences in Pain Experience in Marathon Runners Dr. Patrick O'Connor, Department of Kinesiology and Department of Exercise Psychology
Ryan M. Friday Faculty Mentor	Vesicular Stomatitis in Cattle Dr. Corrie Brown, Department of Pathology
Steven A. Gay Faculty Mentor	Potential Novel O-N-acetylglucosamine Transferase (OGT) Downregulation Technique for <i>D. rerio</i> Dr. Scott Dougan, Department of Cellular Biology
Elizabeth K. George Faculty Mentor	Association Between Infant Feeding and Overweight/Obesity in Ghana, West Africa Dr. Alex Anderson, Department of Food & Nutrition
Samantha J. Haring Faculty Mentor	Corticosterone and Its Effects on Stress-Induced Weight Loss Dr. Ruth Harris, Department of Food & Nutrition
Laura M. Harrison Faculty Mentor	Newcastle Disease Pathogenesis Dr. Corrie Brown, Department of Pathology
Lauren F. Kelly Faculty Mentor	<i>Eres un Universo de Universos: Reconnecting with the Human Aspects of Medicine Through Field Experiences on La Isla de Ometepe</i> Dr. Pamela B. Kleiber, Honors Program
Lauren F. Kelly Faculty Mentor	The Role of Plasminogen Activator Inhibitor-1 (PAI-1) in the Immunopathogenesis of <i>Plasmodium falciparum</i> -mediated Placental Malaria Dr. Julie Moore, Department of Infectious Diseases
Christine M. Kendrick Faculty Mentor	Evaluation of Potential Inhalation Hazards of Petroleum-, Synthetic- and Bio-Fuels Using GC/MS Analysis of Vapors under Equilibrium Conditions Dr. Jeffrey Fisher, Department of Environmental & Health Sciences
Karen S. Kenner Faculty Mentor	Finding the Best Protocol to Homogenize Carbon Nanotubes Dr. Marcus Lay, Department of Chemistry

⌘ Program ⌘

Noah A. Koon Faculty Mentor	Mutagenesis Analysis of the Chain Length Determination Domain of the <i>Toxoplasma gondii</i> Farnesyl Diphosphate Synthase Dr. Silvia Moreno, Department of Cellular Biology
Andrew F. Kragor Faculty Mentor	Unbiased Isolation of Alpha-Dystroglycan Dr. Carl Bergmann, Complex Carbohydrate Research Center
James P. MacNamara Faculty Mentor	Inhibition of the CaaX Proteases Rce1p and Ste24p with Peptidyl (Acyloxy)Methyl Ketones (AOMK) and Quinolinol Based Molecules Dr. Timothy Dore, Department of Chemistry
Margaret C. Madean & Sohyun Kwon Faculty Mentor	Female Choice and Male Mating Success in <i>Drosophila</i> Sexual Selection Dr. Wyatt Anderson, Department of Genetics
Sharon A. McCoy Faculty Mentor	Dialect Perceptions of Spanish Speakers in Georgia Dr. Chad Howe, Department of Romance Languages
Amy M. McGoff & Harold Jackson Faculty Mentor	Polyphenolic Antioxidants in Unprocessed Traditional Diets: Wild-Crafted Acorn Flour as a Dietary Staple Dr. James Hargrove, Department of Food & Nutrition
David T. Mitchell Faculty Mentor	Effects of Social Environment on Women's Participation in Computer Science Dr. Victoria Plaut, Department of Psychology
Jessica L. Mobley Faculty Mentor	Is a Hepatitis E-Like Virus Found In Cats and Does It Cause Hepatitis? Dr. Elizabeth Howerth, Department of Pathology
Michael D. Mogill Faculty Mentor	Oxygen Delivery After Ischemia in Active and Inactive Subjects Dr. Kevin McCully, Department of Kinesiology
Prashant Monian Faculty Mentor	Expression of Glycerophospholipids in Rat Brain after Cocaine Withdrawal Dr. Brian Cummings, Department of Pharmaceutical & Biomedical Sciences
Diana Murro Faculty Mentor	Creation of a Transposon Library in <i>Francisella tularensis</i> Strain LVS Dr. Russell Karls, Department of Infectious Diseases
Neil D. Naik Faculty Mentor	Investigating the Role of Corticotrophin Releasing Factor 1 Receptors (CRFR1) in Stress-Induced Weight Loss Dr. Ruth Harris, Department of Food & Nutrition

❧ Program ❧

Muktha S. Natrajan Faculty Mentor	The Role of KIT-Ligand in Enrichment and Differentiation of Germ-Like Cells in Human Embryonic Stem Cell Cultures Dr. Steven Stice, Department of Animal & Dairy Science
Natalie A. Nesmith Faculty Mentor	Genetic Studies on the Roles of KITL in Regulating Germ Cells in Mice Dr. Mary Bedell, Department of Genetics
William T. Oliver Faculty Mentor	The Effects of Alcohol Abuse on Antisaccade Performance Dr. Jennifer McDowell, Department of Psychology
Tulsi Patel Faculty Mentor	Development of a Biocontrol Agent for Chinese Privet, <i>Ligustrum sinense</i> Dr. Scott Gold, Department of Plant Pathology
Amanda C. Perofsky Faculty Mentor	Behavioral Effects of Navigate® on Paedomorphic Mole Salamanders, <i>Ambystoma talpoideum</i> Dr. John Maerz, Department of Wildlife
Tomas Pickering Faculty Mentor	Measuring Proficiency of Palm Nut (<i>Attalea sp.</i>) Cracking in Wild Bearded Capuchin Monkeys (<i>Cebus libidinosus</i>) Dr. Dorothy Fragaszy, Department of Psychology
Cleveland A. Piggott Faculty Mentors	The Role of Microtubules in the Formation and Degradation of Hirano Bodies Dr. Marcus Fechheimer, Department of Cellular Biology Dr. Ruth Furukawa, Department of Cellular Biology
Adam Pyrzak Faculty Mentors	Acidocalcisome-like Granules of Chicken Egg Yolk – Polyphosphate Content and Its Relationship to Development Dr. Roberto Docampo, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases Dr. Paul Ulrich, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases
Anita C. Randolph Faculty Mentor	Functionality of Glutamate Receptors in hESC-derived Neural Progenitors vs. Matured Neurons Dr. Steven Stice, Department of Animal & Dairy Science
Amanda N. Rinehart Faculty Mentors	Identity Achievement as a Function of Age, Gender, and Ethnicity Dr. Douglas Kleiber, Department of Counseling & Human Development Dr. Pedro Portes, Center for Latino Achievement & Success in Education
Jarrad W. Rowse Faculty Mentor	Understanding M16A Metalloprotease Enzymology Dr. Walter Schmidt, Department of Biochemistry & Molecular Biology

⌘ Program ⌘

Julia R. Schuchard	Relationships Between Psychosis Risk Scales and Antisaccade Performance
Faculty Mentor	Dr. Jennifer McDowell, Department of Psychology
Jeff Shapiro	Effects of Initial Population Size and Food Quality on Stochastic Population Persistence
Faculty Mentor	Dr. John Drake, Eugene Odum School of Ecology
Edgar A. Shartilov	Functional Characterization of a Putative Inositol-1,4,5-Triphosphate Receptor in the Parasite <i>Trypanosoma brucei</i>
Faculty Mentors	Dr. Silvia Moreno, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases Dr. Paul Ulrich, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases
Lindsay T. Stein	The Distribution of Rabies Antigen by Immunohistochemistry in the Brains of Different Mammalian Species
Faculty Mentor	Dr. Corrie Brown, Department of Pathology
Yen Tran	Comparison of the Acute Toxicity of Selective Serotonin Reuptake Inhibitors (SSRIs) and St. John's Wort (<i>Hypericum perforatum</i>) to <i>Ceriodaphnia dubia</i>
Faculty Mentor	Dr. Marsha Black, Department of Environmental & Health Sciences
Kathryn L. Turner	RGS Regulation of the LPA Signaling Pathway in Prostate Cancer Cells
Faculty Mentor	Dr. Shelley Hooks, Department of Pharmaceutical & Biomedical Sciences
Matthew A. Turner	An Investigation of the Relationship between the Existence of Inc A/C Plasmids and the Prevalence of Multiple Therapeutic Antibiotic Resistances
Faculty Mentor	Dr. Susan Sanchez, Department of Pathology
Manouela V. Valtcheva	SPQ-Identified Schizotypy and Antisaccade Performance in a Normal Population
Faculty Mentor	Dr. Jennifer McDowell, Department of Psychology
Dana Wagshal	Source Memory and Picture Location in Relation to Working Memory
Faculty Mentor	Dr. Nash Unsworth, Department of Psychology
Wei Wang	Is Elevation of O-GlcNAc Levels Both Necessary and Sufficient to Extend Median Lifespan?
Faculty Mentor	Dr. Lance Wells, Department of Biochemistry & Molecular Biology

❧ Program ❧

Aaron O. Watwood Design Evolution of a Non-Electric Evaporative-Cooling Milk Container for Smallholder Farmers in East Africa
Faculty Mentor Dr. William Kisaalita, Department of Biological & Agricultural Engineering

6:15 p.m. Art Gallery Talks

Classic Center, Fire Hall

Introductions Dr. Pamela B. Kleiber, Associate Director, Honors Program
Prof. Georgia Strange, Director, Lamar Dodd School of Art
Ms. Nora Wendl, Gallery Director, Lamar Dodd School of Art

Visual Arts Presenters

Meghan Boling, Talia Bromstad, David Broughton, Kathryn Burne, Bryan Hilley, Corey Jameson, Lauren Kesler, Ivy Lane, Eric Lotzer, Katherine Osbum, Lauren Ramsey & Ivy Williams *Collaborative Print Project: Prada Shoes*
Faculty Mentor Prof. Shelly DiCello, Department of Printmaking

Gabrielle Bratton, Maddie Edwards & Miriam Rowe *Project Runway: Consume*
Faculty Mentors Prof. Clay McLaurin, Department of Fabric Design
Prof. Mary Pearse, Department of Jewelry/Metalsmithing

Jenny Bryant, Julie Givens & Marilyn Zapf *Project Runway: Cyborg*
Faculty Mentors Prof. Clay McLaurin, Department of Fabric Design
Prof. Mary Pearse, Department of Jewelry/Metalsmithing

Ashley Buchanan, Lindsey Bartell, Eleanor Simmons & Jenny Moore *Project Runway: The Defense of Intimacy*
Faculty Mentors Prof. Clay McLaurin, Department of Fabric Design
Prof. Mary Pearse, Department of Jewelry/Metalsmithing

Adam Gruszynski *The People*
The Tower
Nancy
Faculty Mentors Prof. Ted Saupe, Department of Ceramics
Prof. Sunkoo Yuh, Department of Ceramics

Kathleen Janvier *Residue Brooch*
Faculty Mentor Prof. Mary Pearse, Department of Jewelry/Metalsmithing

⌘ Program &

**Lindsay MacLean
Ruderman, Susan Kent
& Rachel Huggins**

Faculty Mentors

Project Runway: Untitled

Prof. Clay McLaurin, Department of Fabric Design
Prof. Mary Pearse, Department of Jewelry/Metalsmithing

**Marie Tetzlaff, Allison
Sheats & Kathleen Janvier**

Faculty Mentors

Project Runway: Screen Study

Prof. Clay McLaurin, Department of Fabric Design
Prof. Mary Pearse, Department of Jewelry/Metalsmithing

Marilyn Zapf

Faculty Mentor

Simulacrum Ring

Prof. Robert Jackson, Department of Jewelry/Metalsmithing

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

8:00 p.m. Awards Ceremony

Classic Center, Fire Hall

**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

ℵ Excellence in Undergraduate Research Mentoring Awards &

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 Opening Session on Monday, March 31, 2008 at 4:00 p.m. in the Classic Center, Athena Ballroom E.

2008 Awards

Master Level Faculty Award

Dr. John J. Maurer, Professor of Population Health

Early Career Faculty Award

Dr. Walter K. Schmidt, Assistant Professor of Biochemistry & Molecular Biology

Program Award

Biomedical and Health Sciences Institute

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 2008 Symposium

Michael Amlung	Psychology
Kate Brandon	Microbiology
Sarah Craven	Microbiology
Robert Crawford	Geology
John M. Davis	Ecology
Matt First	Marine Sciences
Leslie Green	Housing & Consumer Economics
Ivy Holliman	History
Carly Jordan	Cellular Biology
Lisa Kanizay	Plant Biology
Tyler Kartzinel	Ecology
Cynthia McMeekin	International Affairs
Marie Milward	Political Science
Rebecca Nordin	Educational Psychology & Instructional Technology
Sharon O'Kelley	Math Education
Tom Okie	History
Natalie Pope	Social Work
David Porcaro	Educational Psychology & Instructional Technology
Sarah Reiff	Cellular Biology
John Ronquillo	Public Administration & Policy
Chip Small	Ecology
James Tucker Swindell II	Biochemistry & Molecular Biology
Matt Tessier	Chemistry
Sarah Vess	Educational Psychology & Instructional Technology
Caroline Watson	Chemistry
Jennifer White	International Affairs

Reviewers for Best Paper Awards

Michael Amlung	Graduate Student, Psychology
Dr. Wyatt Anderson	Alumni Foundation Distinguished Professor, Genetics
Caroline Barratt	Reference Librarian, UGA Libraries
Dr. E. M. (Woody) Beck	Meigs Distinguished Teaching Professor, Sociology
Dr. Marcus Fechheimer	Meigs Distinguished Teaching Professor, Cellular Biology
Matt First	Graduate Student, Marine Sciences
Dr. Margaret Holt	Professor Emerita, Adult Education
Dr. Sylvia Hutchinson	Professor Emerita, Language & Literacy Education and Institute of Higher Education
Carly Jordan	Graduate Student, Cellular Biology
Dr. William Kisaalita	Professor, Biological & Agricultural Engineering
Sharon O'Kelley	Graduate Student, Math Education
Tom Okie	Graduate Student, History
James Tucker Swindell II	Graduate Student, Biochemistry & Molecular Biology
Dr. Fran Teague	Meigs Distinguished Teaching Professor, English
Matt Tessier	Graduate Student, Chemistry
Elizabeth White	Reference Librarian, UGA Libraries

❧ *Thanks and Acknowledgements* ❧

Reviewers for Excellence in Undergraduate Research Mentoring Awards

Dr. Josef M. Broder	Dean and D. W. Brooks Distinguished Professor of Agricultural & Applied Economics, College of Agricultural & Environmental Sciences
Dr. Timothy R. Hoover	Associate Department Head and Associate Professor, Microbiology, Franklin College of Arts & Sciences
Dr. Patricia Hunt-Hurst	Department Head and Professor, Textiles, Merchandising & Interiors, College of Family & Consumer Sciences
Dr. William Kisaalita	Professor, Biological & Agricultural Engineering, College of Agricultural & Environmental Sciences
Dr. Jody Clay-Warner	Associate Professor, Sociology, Franklin College of Arts & Sciences

Reviewers for CURO Summer Research Fellowships

Dr. E. M. (Woody) Beck	Meigs Distinguished Teaching Professor, Sociology
Dr. Gaylen Edwards	Professor, Physiology & Pharmacology
Dr. Paul Schroeder	Professor, Geology
Dr. Regina A. Smith	Associate Vice President for Research
Dr. Fran Teague	Meigs Distinguished Teaching Professor, English
Dr. Brahm Verma	Professor, Biological & Agricultural Engineering

CURO Advisory Board

Dr. Wyatt Anderson	Alumni Foundation Distinguished Professor, Genetics
Dr. E. M. (Woody) Beck	Meigs Distinguished Teaching Professor, Sociology
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Prof. Jere Morehead	Vice President for Instruction
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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
Adele Handy	Undergraduate Student, Biology and Psychology
Courtney Thomas	Undergraduate Student, English

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 DeMarrais	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. Jeffrey 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. 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

Aggressive Behavior and Prezygotic Isolation in *Drosophila persimilis* and *D. pseudoobscura*

Kyle F. Abramowicz

Dr. Wyatt Anderson, Department of Genetics,
University of Georgia

The two species *Drosophila persimilis* and *Drosophila pseudoobscura* are ideal models for the study of speciation. They are of particular interest because of their natural distribution - the range of *D. persimilis* is entirely within that of *D. pseudoobscura*. Sympatric speciation is a divergence in the same geographic area, whereas allopatric speciation involves a geographic separation. In this experiment, aggressive behaviors of different *Drosophila* strains were observed to investigate the possible effects of aggressive behavior on the sympatric speciation of *D. persimilis*. An acrylic variant of Elens-Wattieau mating chambers were used to observe *D. persimilis* paired with *D. pseudoobscura* from populations that exist naturally in sympatry or allopatry with *D. persimilis*. Six aggressive behaviors were observed - wing threat, fencing, lunging, boxing, holding, and chasing. Aggressive behavior was totaled for each encounter. Means and standard errors were calculated and analyzed for significance. The collected data showed a significantly higher incidence of aggressive behavior in *D. persimilis* when paired with the allopatric strain of *D. pseudoobscura*. There were no meaningful differences in aggressive behavior between the two strains of *D. pseudoobscura*. The higher aggressive behavior observed in the allopatric pairing indicates that while aggressive behavior is not a significant source of prezygotic isolation in sympatric populations, it is impacted to greater levels in allopatry. A possible cause is that there is a cost to aggressive behavior, thus reducing the fitness of constantly aggressive individuals. Further studies on the interacting behavior of closely-related species may reveal a behavioral influence on speciation.

Epistasis for Fitness among Biosynthesis Genes in Yeast

Matthew C. Agan, CURO Scholar

Dr. David Hall, Department of Genetics,
University of Georgia

Understanding the evolution of sexual reproduction is a central question in evolutionary biology. Deleterious mutations play an important role in theories for the evolution of sex. Specifically, if different deleterious mutations interact so that their combined effect is greater than the sum of their individual effects, sexual reproduction is more likely to evolve. This phenomenon is termed synergistic epistasis. I generated yeast strains with all possible combinations of six different mutations (zero mutations, six different single mutations, etc.) and scored their fitness to test for evidence of synergistic epistasis. The results and analysis of patterns of fitness from four different tests will be presented: haploid mating efficiency, diploid sporulation efficiency, and both haploid and diploid growth rate. Each test will estimate the fitness of every genotype using a different component of fitness, so that all four together will encompass the entire life cycle of the yeast. Evidence of synergistic epistasis in any of the assays would provide support for current theories for the evolution of sexual reproduction

A Psychological View of Wolf/ Mörike's Peregrina Songs

Caroline M. Anderson, CURO Summer Fellow,
CURO Scholar

Dr. Max Reinhart, Department of Germanic &
Slavic Languages, University of Georgia

Hugo Wolf's (1860-1903) and Eduard Mörike's (1804-1875) *Peregrina I* and *II* (1888) are songs rich in harmonic and rhythmic complexities that do not always hold a clear relationship with the texts. Unfortunately, the considerable body of scholarship on German art songs has generally taken an analytical approach that focuses primarily on texts. As a result, the musical layers of these songs are often only explored superficially. Deborah Stein and Susan Youens are the only scholars to come close to touching

on the issue of psychological distress and tension within these art songs, though her research is still limited to minimal songs. My research incorporates a combination of text analysis, music theory, and psychology; this approach in particular allows one to more closely examine the relationship between the text, which represents the conscious mind, and the music, which represents the subconscious mind. The established literature does cover the basics of art songs by discussing musical symbolism and mood representation, but Wolf's choice to portray the deeper meaning of the poem, rather than the surface value, is scarcely discussed. Through my research, I realized that two areas of conflict are within the songs; the struggle between fantasy and reality, and desire for love and the disappointment that ensued, the latter being very personal for Mörike. The conflicts result in a shift of functionality of the underlying harmonies, in which the nature of harmonic function is a psychological parallel to the text. The harmonic shift is therefore a reflection of the conflicts. The musical representation of developing insanity is that of unusual chord inversions and desires is represented by jarring syncopation. With these findings, I provide a new model for analyzing the German art song tradition that allows for a greater understanding of the interaction between the music and text.

The Influence of Family Structure on Aggression Displayed in Young Head Start Children

Matthew G. Anderson, Lindsay Bailey, Christopher Newberry, and Jimmie Flower
Dr Tsu-Ming Chiang, Department of Psychology, Georgia College & State University

Current research of childhood aggression has shown significant relationships exist between the quality of mother-child relationships and their children's external aggression. However, the majority of these studies of childhood aggression were limited to study how aggression is displayed in middle class families. Few studies examined the influence of social variables, such as lower social economic status

and/or single parent background, have on children's aggression. The need to examine how diverse family dynamics are related to children's social development is evident. The present study thus designed to examine the relationship between the reported parental child-rearing beliefs and their children's aggressive behaviors observed in the classroom from a local head start program. Many children in these samples do not have residential fathers. Some children even frequently lack any paternal guardian. Fifty two children with ages range from 35 months to 48 months old in two waves of data were used to document how various types of demographic background related to children's displays of aggressive behaviors. Guardians of these children were asked to fill out a survey (Chiang, 2006) regarding their observations of children's hurting and helping behaviors and disciplinary practices. Teachers were given Social Competence Behavior Evaluations (by LaFreniere) to rate children's social behaviors in school. Although children from single parent households did not show more aggressive behaviors, children from father present families tend to have better social skills. Further results and implications will be discussed at the conference to address whether children are universally better with two parents in social development.

The Engineering Learning Environment

Ashley A. Babcock
Dr. Nadia Kellam, Department of Biological & Agricultural Engineering, University of Georgia

Previous studies have indicated that the engineering learning environment strongly influences a lack of diversity among students as well as harboring a "chilly" environment for students, both male and female. This "chilly" environment harbors competitiveness, loneliness, and separation of students and professors, culminating in the limited spectrum of surviving students, particularly females, who comprise only 20% of those who graduate. While there is much literature focusing on learning environments, little has been directly extended to the engineering learning

environment and its impact on women. Because the learning environment can empower or marginalize people, this research aims to not only understand the learning environment but also the connection between the learning environment and attraction and retention of diverse people, specifically women. A set of semi-structured interviews employ biographic and linguistic analysis methodologies to elicit female students' accounts of their learning environment in engineering. The interview questions elicit narratives from the female students describing their decision to major in engineering, a typical day in the classroom, the topics in their courses, the building's aesthetics, and any reluctance to continue in engineering. Qualitative research methodologies are used to elicit greater, contextual understanding of women's experiences since quantitative research tends toward marginalization of subjects, seeking broad generalizations. These accounts highlight environmental attributes and detriments, indicating that the engineering learning environment is "chilly." Graduate-bound students indicate that their success is accredited to support groups via club involvement and undergraduate research that helped dissipate this "chilly" environment.

Examining Parenting Stress for Mothers of Young Children with Autism Spectrum Disorders

Jennifer L. Barr

Dr. Jonathon Campbell, Department of Education Psychology & Institutional Technology, University of Georgia

Parents of children with an Autism Spectrum Disorder (ASD) report higher stress levels than parents of typically developing children and parents of children with Down syndrome. Research has shown that parents of children with ASD attribute the highest degree of parenting stress to their child's: embarrassing disruptive behavior, lack of prosocial behaviors, and inability to function independently. This study examined Parenting Stress Index (PSI) scores of six families with children with ASDs (50% male, $M = 4$ years, 2 months) participating in the

Parent-Child Interaction Therapy (PCIT) Clinic at the University of Georgia. Participant PSI scores were compared to literature documenting specific stress profiles of parents of children with ASDs. Based on the published literature, the author predicts that parents of children with ASDs will score higher on certain subscales of the PSI. In the child domain, participants should score highest on the distractibility/hyperactivity, reinforces parent, and acceptability subscales. In the parent domain, participants are predicted to score highest on attachment, role restriction, and depression. Further, recommendations will be made as to whether PSI Total Stress scores or PSI subscale scores should be utilized when examining the effect of treatment on parenting stress in families of children with ASD.

Can Smallholder Dairy Farmers of Southwestern Uganda Save Their Evening Milk?

Robert D. Bennett

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

Due to the poor infrastructure of the milk trade of Uganda, smallholder dairy farmers of Southwestern Uganda have no way of selling the evening milk which constitutes thirty-five percent of the total milk harvested. A cooler is being created to save this milk until it can be taken to market the following morning; however, it still stands to be determined if the cost of the design can be repaid by the farmer. The purpose of this paper is to determine the affordable cost of the cooler to guide the design and fabrication processes. The average smallholder farmer has 5 cows which produce a total of 50 liters of milk daily, 17.5 liters of which are produced in the evening. The current market price for the farmer is 200 Uganda Shillings (US\$) per liter while the cooler design currently costs 170,000 US\$. It will be shown that there is need for the manufactured cost to be lowered to allow the farmer to repay the initial cost in two years. However, expeditious repayment is shown to be a possibility with the supplement in income that the evening milk

provides. Also, the above calculation is considered conservative; it is speculated that the current price of milk will rise due to demand rising as the infrastructure of transporting and storing processed milk, which is relatively new in Uganda, becomes refined. With a rise in price and therefore profits for the farmer, the repayment period would be shortened allowing more farmers to obtain the product without a debilitating debt.



Collaborative Print Project: Prada Shoes

Meghan Boling, Talia Bromstad, David Broughton, Kathryn Burne, Bryan Hilley, Corey Jameson, Lauren Kesler, Ivy Lane, Eric Lotzer, Katherine Osburn, Lauren Ramsey & Ivy Williams

Prof. Shelly DiCello, Department of Printmaking, University of Georgia

In this collaborative project, Lamar Dodd School of Art Visiting Assistant Professor Shelly DiCello, Visiting Artist Libby Black, and twenty undergraduate, graduate and faculty artists (selected by artist Libby Black after an application process) each created a print corresponding to a narrative penned by Black, "Prada Shoes." The parameters of the project asked that each participant draw and etch a pair of Prada shoes that they desire to own. Each participant then created an edition of 25 prints from their matrix, as well as one paper box that housed this portfolio.

The Role of Rif1 in *Kluyveromyces lactis* Telomere Maintenance

Andrew D. Bosson, CURO Scholar
Dr. Michael McEachern, Department of Genetics

Linear chromosomes present two major problems to a cell. The first is that every round of replication slightly shortens the chromosome ends because initiation requires a primer, and the second is that the ends can be confused with damaged DNA and therefore be degraded by the cell. To prevent the loss of genetic information at the chromosome terminus during each round of replication, eukaryotic chromosomes have structures on their ends, called telomeres, consisting of multiple repeats of a short non-coding DNA sequence capped with telomeric proteins. The enzyme telomerase maintains the functional telomeric structure by adding more DNA repeats when the telomeres get too short. Since most adult human somatic cells do not need to divide any more, they do not express telomerase, and replication eventually leads to senescence. In most carcinogenic cells, however, telomerase is expressed at high levels, allowing the cells to divide indefinitely. Basic knowledge of telomerase and telomerase-related proteins is therefore of great importance to cancer research. This project details the involvement in telomere maintenance of a telomerase-associated protein, Rif1, in the model yeast *Kluyveromyces lactis*. Rif1 knockout mutants were grown in different genetic backgrounds and analyzed for phenotypic effects, including telomere length, in order to determine how Rif1 affects telomerase activity and the capping of telomeres. The results of this study provide a better understanding of the function of Rif1 on the telomerase complex and the alternative telomere elongation process of recombination.

Are We Really Ready? The Need for National Standards and the Creation of the Cycle of Emergency Planning

Ashley A. Bowen, Roosevelt @ UGA
Dr. Brock Tessman, Department of International Affairs, University of Georgia

After witnessing the September 11th attacks and the aftermath of Hurricane Katrina, Americans have become increasingly concerned about the safety and security of the United States. A review of the Department of Homeland Security's (DHS) policies and recent performance reveals major weaknesses in the nation's preparedness for protecting against and responding to terrorist attacks and natural disasters. Research has shown that the DHS currently lacks any national standards for the review and maintenance of emergency plans, the frequency of emergency drills, and the review of results from such drills. This policy proposes the standardization of emergency exercises across the nation and the creation of the Cycle of Emergency Planning (CEP), with DHS funding contingent on the implementation of these national standards. This paper addresses how the implementation of the CEP would provide a method for testing, revising, and maintaining emergency preparedness through review, exercises, and revision. The CEP is designed to resolve many of the current breakdowns in planning at the state and local level. Holding emergency exercises at least every two years and reviewing their results will help keep plans current and grounded in feasibility. Reviews of emergency plans and capabilities, conducted every five years by a third party, will help maintain objectivity in the reviewing process. These exercises and reviews should be used to update and maintain emergency plans as part of the CEP. Enforcing these new standards will remedy the failures in the current emergency preparedness system and improve the general safety and security of the nation.



Project Runway: Consume

Gabrielle Bratton, Maddie Edwards & Miriam Rowe

Prof. Clay McLaurin, Department of Fabric Design, University of Georgia

Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

In this collaborative project and runway exhibition by Jewelry/Metalsmithing students of Professor Mary Pearse and Fibers students of Professor Clay McLaurin, material, adornment and body as site are examined and performed, taking cues from Visiting Artist Anya Kivarkis, and the publication "Fashion at the Edge." For one week, these students worked in teams of five with non-traditional materials, manipulating paper towels, hosiery, window screening and roofing shingles into performative, and in some cases spectacular, wearable art.

This piece explores the concept of restriction. We chose physically light weight materials,

nylon and polyester batting, to create the illusion of something heavy that would weigh down the body. The decision to use nylons was also important because nylons are physically restrictive to the body. We wanted this piece to restrict the body's movement both by adding weight and tension.

Materials: Paper, cupcake liners, paper towels

Towards the Discovery of Ras-Converting Enzyme Inhibitors - A Novel Anti-Cancer Target

Sarah R. Breevoort, CURO Scholar
Dr. Walter Schmidt, Department of Biochemistry & Molecular Biology, University of Georgia

The proteases Rce1p and Ste24p promote a proteolytic step associated with the maturation of proteins containing a C-terminally localized *CaaX* motif, (*C* = cysteine, *a* = small aliphatic amino acid, *X* = one of several amino acids). Rce1p is considered a chemotherapeutic target because of its crucial role in the maturation of Ras proteins. Hyperactive forms of Ras are associated with 30% of human cancer tumors, including more than 90% of pancreatic cancers and 50% of lung cancers. Inhibiting Ras maturation is proposed to disable, or at least moderate, its cancer-causing activity. Because of the critical role Rce1p has in Ras maturation, compounds that inhibit Rce1p are being considered as anti-cancer therapeutics. In this study we compared the inhibitory profiles of the Rce1p and Ste24p *CaaX* proteases using peptidyl(acyloxy) methyl ketones (AOMKs) and inhibitors identified by high throughput screening (HTS). We conclude that AOMKs, although displaying better inhibitory properties than certain previously reported Rce1p inhibitors, are unlikely therapeutic candidates partially because of the inability to significantly enhance their potency. Nevertheless, we did observe instances of selectivity among the *CaaX* proteases, which makes these compounds effective tools for investigating *CaaX* protease enzymology. The inhibitory profiles of compounds identified by HTS and their analogs

were also evaluated, and several compounds appear to be potent and specific Rce1p inhibitors. The compounds identified represent new tools for understanding the enzymology of post-isoprenylation modifying enzymes and provide new insight for the future development of Rce1p inhibitors that could be developed as anti-cancer drugs.

Forced Copulation and Offspring Viability in *Drosophila melanogaster*

Emily Dale Broder, CURO Scholar
Dr. Wyatt Anderson, Department of Genetics, University of Georgia
Dr. Yong-Kyu Kim, Department of Genetics, University of Georgia

The compensation hypothesis predicts that males and females mated with non-preferred partners attempt to make up for viability deficits in their surviving offspring by increasing reproductive investment. Consistent with the hypothesis of reproductive compensation, previous studies show that fewer offspring resulted from non-preferred matings in *Drosophila pseudoobscura* though males transferred more sperm when constrained to mate with a non-preferred partner. Using *Drosophila melanogaster*, I tested the compensation hypothesis by measuring offspring viability when females were constrained to mate with non-preferred partners. I employed natural phenomenon to create non-preferred matings: forced copulation and familiarity. Mature males forcibly copulate teneral females (very young immature flies) in nature. Following protocols from previous studies, I placed teneral females in vials with two mature males, but I observed no matings in over 60 trials. In previous experiments, flies avoided mating with each other when either non-siblings or siblings were raised together (familiarity); therefore matings between non-siblings raised together in the same vial are considered non-preferred. I raised non-siblings together in the same environment and crossed mature flies under one of two treatments: non-siblings raised together (NSRT) or non-siblings raised apart (NSRA). Fecundity and fertility will be measured for offspring viability. Preferred

matings (NSRA) and non-preferred matings (NSRT) will be compared to test the compensation hypothesis. I expect matings between NSRT to yield more eggs but an equal number of offspring as NSRA. The results of these experiments will shed light on the components of reproduction that underline natural selection.



Project Runway: Cyborg

Jenny Bryant, Julie Givens & Marilyn Zapf
Prof. Clay McLaurin, Department of Fabric Design, University of Georgia
Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

In this collaborative project and runway exhibition by Jewelry/Metalsmithing students of Professor Mary Pearse and Fibers students of Professor Clay McLaurin, material, adornment and body as site are examined and performed, taking cues from Visiting Artist Anya Kivarkis, and the publication "Fashion at the Edge." For one week, these students worked in teams of five with non-traditional materials, manipulating paper towels, hosiery, window screening and roofing shingles into performative, and in some cases spectacular, wearable art.

In our age of cyber-technology, identity and personality can exist apart from the body. Is it the moral nature of our bodies that drive us to create potentially immortal and forever youthful online personas, or is it technology that is suffocating our physical presence? As our minds become more disconnected from our body, will the current hybrid nature of technology and

humanity remain? "Cyborg" questions the function of the body in this transitional time of being "plugged-in."

Materials: Electrical Cord, Mirror, Plastic, Vellum

"I Want My Credits!": The Impact of Procedural and Interactional Injustice on Participants' Evaluations of an Experimenter

Nancy D. Brynteson
Dr Alicia Bembenek, Department of Psychology, Georgia College & State University

It is difficult to determine precisely how a person may react when one experiences an injustice. Theory states that people will react negatively to any occurrence of injustice; however, a person experiencing an injustice may react differently depending upon the type of injustice experienced (e.g., procedural or interactional). This study was conducted to determine how participants would react to an experimenter who committed a procedural and/or interactional injustice against them. Undergraduates (N = 37) were provided with a cover story that they were completing a "student lifestyle" survey for research credit. Prior to the survey being completed, some participants experienced an interactional injustice (represented by a disrespectful, unrelated phone call made by the experimenter during the session). After the survey was completed some participants experienced a procedural injustice (represented by denial of research credit). Responses to the injustices were thereafter obtained with an "experimenter evaluation" which measured participants' thoughts (e.g., perceptions of respect), feelings (e.g., anger, disappointment), and behaviors (e.g., intentions to participate again with same experimenter) on 1 = *not at all* to 10 = *very much* scales. The results indicated that participants did perceive both types of injustices as unfair. However, participants responded negatively only after the procedural injustice was committed (i.e., when they were denied research credit), and did not appear to be affected by the interactional injustice (i.e., the inappropriate phone call).

Questions remain as to whether a non-student population would react similarly, as reactions to an injustice may depend strongly on *expectations* of social interactions.



Project Runway: The Defense of Intimacy

Ashley Buchanan, Lindsey Bartell, Eleanor Simmons & Jenny Moore
Prof. Clay McLaurin, Department of Fabric Design, University of Georgia
Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

In this collaborative project and runway exhibition by Jewelry/Metalsmithing students of Professor Mary Pearse and Fibers students of Professor Clay McLaurin, material, adornment and body as site are examined and performed, taking cues from Visiting Artist Anya Kivarkis, and the publication "Fashion at the Edge." For one week, these students worked in teams of five with non-traditional materials, manipulating paper towels, hosiery, window screening and

roofing shingles into performative, and in some cases spectacular, wearable art.

The Defense of Intimacy deals with an individual's prerogative to protect the aspects with which they feel most uncomfortable. By juxtaposing a hard, coarse outer shell with a pure, soft, and tactile interior the wearer can choose how she wishes to express her vulnerability.

Materials: Textured Poster Board, Satin, Organza, Yard Tubing

Charcoal-Powered Vacuum-Zeolite Adsorption Cooler Regenerator for the Preservation of Milk, Vaccines, and Other Perishables

Jessica L. Buday

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

Smallholder dairy farmers in Sub-Saharan Africa are not able to sell their evening milk to dairy processing centers because of the lack of appropriate equipment and electricity sources to cool the milk during transport. Through another undergraduate engineering design and research program, a cooler previously designed for alcoholic beverages (CoolKeg) is being adapted to meet this need. The cooler uses a vacuum-zeolite adsorption system and requires no electricity, but it is necessary to recharge it after each use by using heat exposure to regenerate the wet zeolite. The goal of this research is to develop a system that has the capacity to effectively "recharge" the cooler by regenerating (water desorption) the spent zeolite. A charcoal-powered brick oven has been designed using locally-available materials. The CoolKeg was filled with water to act as a milk-substitute, and a cooling curve was generated after every regeneration to indirectly assess the effectiveness of the oven and the stability of the zeolite. Preliminary results presented in terms of Coefficient of Performance (COP) approach those achieved in refrigeration devices employing similar technology, suggesting that

there is room for further optimization of the regeneration process. The success of this project is expected to have impact beyond milk; other preservation applications include vaccines and perishables such as non-alcoholic beverages.

Contemporary Brass Sounds

Bulldog Brass Quintet

Prof. Fred Mills, Director and Department of Academic & Performance Areas (Brass), University of Georgia

If J.S. Bach were alive today, he would love the sound of modern brass playing his compositions. The evolution and development of brass instruments over the last 150 years infuses 21st-century performances of Bach's 18th-century compositions with new life—a new set of clothes, so to speak. It is exciting to hear centuries-old masterworks performed in new styles to reach a modern audience. It is also exciting that American musical styles—jazz, country and western, bluegrass, and rock—have also donned new clothes and are welcomed into concert halls traditionally reserved for serious music of the 18th and 19th centuries. For the CURO Symposium, the Bulldog Brass Quintet will present a selection of “crossover” music—a phenomenon started in the 1960s by Jean-Pierre Rampal, Maurice André, and Itzhak Perlman and continued today by Mark O'Connor and Béla Fleck.

Tommy Cox, Trombone

Josh Cutchin, Tuba

Cathy Kilroe-Smith, Horn

Chris Probst, Trumpet

Aaron Ritter, Trumpet Solo

Brad Whitfield, Trumpet

Characterization of Mitoferrin and Its Interactions with Ferrochelatase

Joseph S. Burch, CURO Summer Fellow, CURO Scholar

Dr. Harry Dailey, Biomedical & Health Sciences Institute, University of Georgia

Iron is an important cofactor in many biological reactions. Due to its high redox nature, iron

availability is highly regulated. Heme synthesis requires iron and is essential for life in almost all organisms. Iron is inserted in protoporphyrin IX during the last step of the heme biosynthesis pathway by ferrochelatase. Since ferrochelatase is associated with the inner-mitochondrial membrane, mitoferrin transports iron into the mitochondria. Little is known about mitoferrin except that it is membrane bound and it is necessary for erythroid iron assimilation into the mitochondria. The goal of this project was to clone, express, purify, and describe different mitoferrin orthologs and any interaction between mitoferrin and ferrochelatase. Five different mitoferrin genes have been isolated: zebra fish mitoferrin 1 (Z1), zebra fish mitoferrin 2 (Z2), human mitoferrin 1 (H1), mouse mitoferrin 1 (M1), and mouse mitoferrin 2 (M2). Thus far, Z1, Z2, H1, and M2 have been cloned into multiple vectors and been expressed in *Escherichia coli*. Talon chromatography was used for purification and western analysis for detection. Small amounts of Z1, H1, and M2 have been detected with western blots. The small quantity of protein has limited further study. Immunoprecipitation reactions with mitoferrin and ferrochelatase have been inconclusive and failed to show any interaction. In further tests, Z1, H1, and M2 will be cloned into a modified pET vector which may provide better yields. With higher yields of the mitoferrins, an interaction between it and ferrochelatase may be shown.

Transcriptional Expression of *Arabidopsis* GAUT Genes: 15 Proven and Putative Plant Cell Wall Biosynthetic Galacturonosyltransferases

Amy J. Burrell, CURO Summer Fellow, CURO Scholar

Dr. Debra Mohnen, Complex Carbohydrate Research Center, University of Georgia

Pectin is a family of plant cell wall polysaccharides that have multiple functions in growth and development and are used for diverse industrial and biomedical products. A family of pectin biosynthetic enzymes known as galacturonosyltransferases catalyze the transfer

of galactosyluronic acid (GalA) residues from uridine diphosphate-GalA to growing polysaccharide chains. The first gene encoding a pectin galacturonosyltransferase, *Arabidopsis thaliana* GALactUronosylTransferase1 (GAUT1), was recently identified. BLAST analyses indicate the existence of 14 additional genes (GAUTs 2-15) with sequence similarity to GAUT1. To understand the biological significance of these genes in pectin synthesis, it is important to understand where and when the genes are expressed. My research goal was to analyze the expression of each GAUT gene in *Arabidopsis* through utilization of a β -Glucuronidase (GUS) reporter gene system. The promoter regions of 13 GAUT genes were determined, amplified, and inserted into cloning vectors. The DNA sequence of the 13 promoter sequences were verified and the remaining two promoter sequences will be amplified soon. Using restriction digestion, the promoter regions of GAUT1 and GAUT7 were removed from the cloning vectors and inserted upstream of the GUS gene in a transformation vector. The GAUT1 and 7 promoter:GUS constructs were transformed into *Arabidopsis* plants using an *Agrobacterium*-mediated method. Transformed plants have been recovered and histochemically stained to detect GUS activity. The results indicating the cell-type and tissue-specific expression of the GAUT1 and GAUT7 genes will be reported and discussed in relation to the functions of the GAUT genes in pectin synthesis.

Emotional and Behavioral Problems Displayed in Preschoolers Raised by Biological Grandparents

Shelby R. Carlson, Holly Chandler, Heather Smith, Rebecca Lewis
Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University

Grandparents often assume the responsibility of raising their grandchildren, commonly to avoid placing children in foster care. There is an increasing 3.6 million grandchildren under the age of 18 being raised by grandparents in the United States. Children raised by grandparents

tend to display more problematic emotional and behavioral development. The most common reason for children to be placed in the care of grandparents has been found to be drug use. Stressful events leading up to the transition of living with grandparents and the transition itself contributed to many emotional fluctuations in the child. Solomon and Marx (1995) found that children raised nontraditionally by grandparents are less successful in school than the children of the traditional, two-parent family. The present study examines a focus group of fifty-two 3-year old and 4-year old preschoolers with emotional and behavioral issues that were collected in a larger intervention study. Guardians of these children were given a parenting survey, and teachers were asked to rate these children's behaviors at school using Social Emotional Behavior Evaluation (SCBE, by LaFreniere). From the data, five returned surveys were from grandparents. The results showed grandparents reported that children less frequently engaged in hurting and aggressive behaviors. However, they were observed to display more disruptive behaviors in class. All five children were the youngest child in the family, with two children being the only child. Therefore, the results can be interpreted in various ways. Detailed results from these cases and their implications will be discussed.

Otavaleños and Cotacacheños: Local Perceptions of Sacred Sites for Farmscape Conservation in Highland Ecuador

Lee Ellen Carter, CURO Summer Fellow, CURO Scholar
Dr. Fausto Sarmiento, Department of Geography, University of Georgia

Indigenous communities around the world are facing pressure from tourism practices. Otavalo, Ecuador, provides one example of how local spiritual values can enhance the conservation efforts of ecotourism. The Imbakucha watershed includes mountain landscapes that numerous indigenous communities hold sacred. In this case, the increased pressure of globalization affects local natural, cultural, and economic values as the watershed undergoes a shift from

traditional to contemporary ecotourism practices. Through ethnographic and qualitative research, the study investigates the relationship between the indigenous people and their sacred land, by way of local understanding of identity and cultural values. The data was collected through 30 interviews conducted with indigenous community leaders, indigenous peoples, nonprofit organization workers, government officials, and academics in Quito, Otavalo, and Cotacachi, Ecuador. The study concludes that there is a general outlook among the interviewees that a stronger influence of environmental ideals can and should be instilled into the livelihood of indigenous communities, in order to promote sacred sites' conservation. We recommend the implementation of a Sacred Site conservation category with six principles, including: recognizing sacred natural sites; integrating these sites into protected area management; promoting participation, inclusion, and collaboration in the community; encouraging improved knowledge of sacred natural sites; protecting sacred natural sites with appropriate management access and use; and respecting the rights of sacred natural sites in national policy. These principles would allow the indigenous communities to preserve their ancestral beliefs and values, while also providing an economic influx through ecotourism.

Improving the Health of Georgia Youth: An Incentive Program for Nutritional Standards in Georgia Schools

Kevin K. Chang, Roosevelt @ UGA
Dr. Phaedra Corso, Department of Health Administration, Biostatistics & Epidemiology, University of Georgia

Since 1980, the prevalence of overweight among children in the United States has tripled. A recent 2007 report identifies the state of Georgia as having the twelfth highest rate of overweight youth in the United States. In Georgia's nearly 2700 schools, there are currently no nutritional standards for competitive foods, or foods sold outside the federal school meal programs, such as food items from vending machines.

Furthermore, Georgia does not require higher nutritional standards than the federal requirements in breakfast and lunches, resulting in only minimal amounts of healthy foods in a student's diet. In order to improve the overall health of Georgia's youth, Georgia's Department of Education should offer an incentive program for all elementary and secondary schools currently lacking nutritional standards. Through a supplemental state reimbursement offered to schools that implement the standards, the program encourages schools to adopt nutritional standards for all competitive foods sold during the school day. These standards include limitations on calories and fat, sugar, sodium, and caffeine content. Schools participating in the program must also provide greater fruit and vegetable options during meal times. Participating schools will receive an increased reimbursement rate for each lunch served through the National School Lunch Program. The state can sustain funding for the program through a special state tax on foods of minimal nutritional value and foods deemed "unhealthy." Allowing schools to phase in implementations over a three-year period, the program promotes a sustained and practical effort in improving the health of Georgia's youth.

Evaluating Protocols for Measuring Immune Defenses in Larval Monarch Butterflies

Jean Chi
Dr. Sonia Altizer, Eugene Odum School of Ecology, University of Georgia

Insects are known to employ various immune defenses to protect against injuries and infections. Hemocytes are insect immune cells that differentiate into granulocytes, plasmatocytes, spheroid cells and oenocytoids. They respond to foreign invasive organisms through a wide range of mechanisms, including encapsulation and phagocytosis. Additionally, infection and injury activate a phenoloxidase (PO) enzyme cascade that produces the compound melanin, which binds to foreign bodies. A study system of monarch butterfly larvae (*Danaus plexippus*) was used to evaluate

and refine current protocols of measuring these two types of defenses by comparing different methods for hemocyte collection, and to investigate the relationship between PO activity, hemocyte counts, and the proportion of differentiated cells to establish baseline values for healthy monarch individuals. Results show that the two methods for collecting hemocytes produced different hemocyte counts, and also show positive correlations between PO activity and hemocyte counts. This study demonstrates that consistent methods for hemocyte collection are necessary for accurate counts, and validates techniques used in studies of monarch immune system responses to infections and environmental stress.

Managing U.S. Aid to Egypt: A Reorientation of Current Support

Chris Chiego, Roosevelt @ UGA
Dr. Brock Tessman, Department of International Affairs, University of Georgia

The Middle East region (excluding Iraq) receives the largest share of the United States' foreign aid at an estimated 38 percent annually. Since 1979, Congress has sent approximately 2 billion dollars a year to Egypt, placing Egypt second only to Israel in total foreign aid. Currently, Congress allocates the majority of aid (\$1.3 billion) for military purposes and \$500 million earmarked for economic aid, though both allocations are essentially unsupervised. With political change looming on the horizon and discontent rising within Egypt, the United States must shift its foreign aid to help ensure Egypt's long-term stability through economic prosperity and political moderation. This paper assesses the current state of Egypt using economic data, current academic scholarship from journals, and newspaper reports and suggests incentive-based changes in the structure of U.S. aid. As Egypt is a bellwether for much of the Arab world, establishing long-term stability in the region, improving overall economic and social conditions in Egypt, and cultivating a favorable impression of the U.S. would all be benefits of such action. Furthermore, the United States should swiftly pass the free-trade

agreement it has already negotiated with Egypt to assuage the Egyptian government and promote Egyptian economic growth. All these interconnected efforts are crucial for the United States to retain its strategic interests in Egypt and ensure a stable, prosperous future for a valuable Middle Eastern ally.

Contours and Melting Crystals

Eric P. Cho
Dr. Robert Varley, Department of Mathematics, University of Georgia

The topic concerns the shape of a particular boundary contour related to a melted crystal. One of the main results from the literature recently set forth by Kenyon and Okounkov is that the projection of the outer contour to the plane is an algebraic curve, to which one naturally assigns a degree. The case when the plane curve is a cardioid of degree 4, already considered by Kenyon-Okounkov, will be discussed to lay the foundation. My research involves exploring other cases of different degrees and visualizing the corresponding curves in 3-dimensional space. This report will analyze other examples, degree formulas and geometric pictures about the projection of these melted crystal contours. Since phase transitions, such as melting or freezing, are rather complex phenomena in nature, any approximate model whose phase transitions can be examined analytically is valuable. The crystal is modeled by a configuration of little cubes, called a stepped surface, so the outer contour projects to a polygon in the plane. By taking the limit of random stepped surfaces, several known rational algebraic curves are produced as a result. With further study in the plane, counting problems arise naturally with implications to better understanding the contour model.

French Dislocation: The Syntax of Power

Andrew C. Clark
Dr. Diana Ranson, Department of Romance Languages, University of Georgia

Dislocation in French occurs when a speaker produces an element of a sentence before or

after that sentence, typically employing within the sentence a pronoun to repeat the dislocated element and to fulfill its normal syntactic position. One might say, for example, *Le chien, je le vois*, “The dog, I see it,” or *Je le vois moi*, “I see it, me.” Previous studies of dislocation assumed that use does not vary according to social factors such as age, sex or class, but according to the speaker’s message and the pragmatic function desired. These studies focused on dislocation’s function in topic shifting and comparison. In a preliminary study of corpora from two French films, *Marius et Jeanette* and *La Boum*, I used the principles of conversational analysis to link dislocation to power and solidarity among speakers. The present study will extend this analysis to the Montpellier-Rognes corpus of spontaneous French recorded in 2005 and 2006. First, I will measure the average frequency of dislocation and determine the deviation from this average for individual speakers and social groups of speakers. If the individuals deviate from the average more than social groups, this would indicate that individual stylistic choice influences dislocation more than social factors. I will then analyze the dislocations within the framework of conversational power and solidarity; a consistent link to these concepts would indicate that speakers employ dislocation to provide stylistic emphasis. This study seeks then to use the distribution of dislocation to illuminate its pragmatic functions.

Nipah Virus and Apoptosis in Cells

Caroline G. Colden

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

Nipah virus (NiV) is a zoonotic disease that recently emerged in Malaysia. This zoonosis, or disease that can be transmitted from animals to humans, causes lethal febrile encephalitis in humans. Understanding the pathogenesis of Nipah virus infection and the role the host immune system plays during this event is critical to devising effective control measures and therapeutics. In this research, we are examining the relationship between apoptosis, or

programmed cell death, during NiV infection in the guinea pig model. Apoptosis, a normal process of the immune response to control infections, is often altered by viruses to facilitate infection and spread. We hypothesized that NiV blocks the apoptosis pathway early during infection allowing for its systemic spread and massive infection of cells. To test this hypothesis we are examining histologic sections from guinea pigs experimentally infected with NiV, using an immunohistochemical assay that employs an anti-active caspase 3 antibody. Caspase 3 is an early indicator of apoptosis activation. We expect to see the same or less apoptosis signaling in tissue sections of infected animals than in those of our non-infected controls.

Physical and Structural Basis for pH Dependence of Transcription Regulation by the Anti-Sigma Factor AsiA

Benjamin P. Crane, CURO Scholar

Dr. Jeffrey Urbauer, Department of
Biochemistry & Molecular Biology, University
of Georgia

Anti-sigma factor proteins inhibit bacterial transcription by binding the sigma subunit of the RNA polymerase. A unique anti-sigma factor is T4 bacteriophage AsiA protein. In *E. coli*, AsiA interacts tightly with the polymerase sigma-70 subunit, and, like other anti-sigma factors, inhibits transcriptional activities. Specifically, AsiA inhibits transcription from bacterial and early phage promoters. Additionally, AsiA assists in transcription activation from phage middle promoters. Thus, AsiA is a unique molecular switch for transcription regulation. Moreover, excess AsiA kills bacteria, suggesting AsiA could serve as an antibiotic development model. Most AsiA studies have been performed at relatively low pH (6.2-7.0). Through concurrent studies, we have determined that AsiA undergoes a substantial, pH-dependent structural reorganization across the range of physiological pH. Using nuclear magnetic resonance (NMR) spectroscopy, we monitored AsiA structure as a function of pH. As pH increases to 7.8 (pK for the transition), spectra

indicate increasing structural heterogeneity. Further increasing pH to 8.2 decreases heterogeneity. At pH 8.2, spectra indicate a stable, single species, structurally distinct from that at low pH. Comparison of the NMR chemical shifts of the low and high pH forms indicates clear, localized structural changes. We have also performed experiments to determine a structure of AsiA at pH 8.1 using residual dipolar couplings (RDCs) from additional NMR experiments. At physiological pH, our results indicate an equilibrium mixture of two distinct structural AsiA forms, and that functional differences between these forms permit pH-dependent regulation. Inclusion of pH-dependent regulation in the antibiotic model could improve antibiotic efficacy.

Room-Poem

Jordan A. Dalton
Prof. Andrew Zawacki, Department of English,
University of Georgia

When the echoes of our words die away, does something of them remain, pressed by the force of sound into the walls themselves? How can we read these word-fossils? Can we halt this rapid dispersion, turn temporary speech into lasting print? If the walls could tell us what they understood of our conversation, what would they say? In this piece, a room has been granted the ability to comprehend language by being given a vocabulary carved from a different, virtual space. (The room of an archive, walled off by a query.) What is then displayed here is the poem carved out of this physical space, the poem created from the (mis)understandings of the hall, the walls themselves. Software is set up in a space, and as the space lives its daily life, the software jots down some of the things it hears. From this arises a poem, to be read or displayed. Voice recognition, one of the most problematic of computer science's algorithms, can yield fascinating results in its failures. Some rudimentary voice recognition software is loaded with a predetermined vocabulary and then run in the symposium space, yielding a poem created from the space's (mis)recognitions of the language used within it. Language's collision

with digital technology might leave something resembling a car crash to those used to its more conventional applications, but with a bit of work, the wreck can become something wonderful.

Long-range Retrograde Transduction of Survival and Trophic Signals in Neurons

Matthew Logan Davis
Dr. James Franklin, Department of
Pharmaceutical & Biomedical Sciences,
University of Georgia

Developing vertebrate neurons depend on target-derived growth factors for survival and neurotrophic support. The precise molecular mechanisms underlying long-range transduction of survival and trophic signals remain unclear. When nerve growth factor (NGF) is withdrawn from sympathetic neurons *in vitro*, a complex intracellular molecular cascade results, leading to caspase-mediated protein degradation and death. A dramatic increase in reactive oxygen species (ROS) that is a critical component of the apoptotic cascade takes place in these cells soon after withdrawal. Neurons can be rescued by late re-addition of NGF which rapidly suppresses ROS production. This suppression is evidence of a rapid survival signal. I will plate mouse superior cervical ganglion (SCG) neurons in novel microfluidic chambers developed at the University of California, Irvine, in which soma are separated from their distal axons. Cells will be deprived of NGF in both somal and distal axon compartments. Somatic ROS levels will be determined by confocal microscopic imaging of neurons loaded with CM-H₂DCFDA, a cell-permeant indicator of ROS that is non-fluorescent until oxidation occurs. An immediate decrease in somatic ROS production after re-addition of NGF to the distal axon compartment would offer evidence that *long-distance* rapid survival signals take place in sympathetic neurons. The rate of movement of the signal may allude to underlying mechanisms. Many neuropathologies will be better understood by the clarification of mechanisms underlying survival signaling, and this research could have important clinical ramifications.

The Role of Insulin-Induced Tyrosine Phosphorylation on O-GlcNAc Transferase (OGT)

Vanessa N. del Valle

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

Posttranslational *O*-GlcNAc modification is a dynamic process that occurs on a myriad of intracellular proteins throughout eukaryotic cells. *O*-linked *N*-acetyl glucoaminyltransferase (OGT) is the enzyme responsible for the addition of the *O*-GlcNAc moiety to serine and threonine residues of target proteins. Elevation in *O*-GlcNAc levels induces insulin resistance in cell culture models, and OGT overexpression leads to glucose disposal defects in rodents. Both of these outcomes are diagnostic of type II diabetes. Therefore, greater understanding of OGT and the *O*-GlcNAc modification is paramount to gaining further insight into the steps that lead to insulin resistance, an early feature of type II diabetes. In this study, we investigate the presence of tyrosine phosphorylation on OGT and its importance to the structure and function of the enzyme. OGT has previously been shown to be tyrosine phosphorylated in response to insulin stimulation though the site and impact of modification has not been elucidated. A point mutation was performed in which tyrosine 988 was substituted by phenylalanine on entry and expression vectors. Tyrosine 988 was chosen because it is the only in-silico predicted site for tyrosine phosphorylation. The point mutation was confirmed using restriction digestion analysis and DNA sequencing. An *E. coli* protein expression system showed the mutant OGT could be expressed after induction with IPTG. Mammalian protein expression systems as well as OGT activity assay analysis will soon follow. These studies will determine if tyrosine 988 is the site of phosphorylation and determine the impact of this modification on properties of OGT.

The Effect of Sample Handling and Storage on the Accuracy and Repeatability of Fecal Worm Egg Counts in Horses

Kimberly L. DeLisi, CURO Summer Fellow, CURO Scholar

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

Drug resistance in parasites is a major threat to the health and well-being of horses. Consequently, it is critical that veterinarians regularly evaluate deworming programs to determine if parasites are becoming drug resistant. Currently, the only means available to diagnose drug resistance in equine parasites is the fecal egg count reduction test (FECRT). However, the lack of any accepted standards for sample handling and storage hamper interpretation of results. The purpose of this investigation was to determine the effects of sample handling and storage on fecal egg count (FEC) data. Two parameters were examined: sample storage temperature, and length of time between defecation and sample collection. In a first set of experiments, fresh feces were collected and stored anaerobically at -10°C, 4°C, 24°C, and 38°C for five days. Fresh feces were then stored aerobically at room temperature, and sub-samples were removed for analysis at 0, 3, 6, 12, and 24 hours. FEC were performed using the modified Stoll technique. After five days at -10°C and 38°C, FEC decreased by 59% and 96%, respectively, whereas at 4°C and 24°C, FEC only changed by 17% and 14%, respectively. FEC in samples collected 12 hours after defecation decreased by only 15% whereas by 24 hours, FEC decreased by 78%. These data suggest that feces less than 12 hours old are suitable for collection, and samples can be stored either anaerobically or in the refrigerator up to five days. These results provide a scientific basis for new recommendations to standardize methods used for FECRT.

Emergency Response: Bringing It to Georgia

Nicole C. DeMarco & Aqsa Mahmud, Roosevelt @ UGA

Dr. Michael Beck, International Center for Democratic Governance, University of Georgia

The events on 9/11 in New York City and Washington, DC stress the role of local governments as the first line of response to terrorist threat. Therefore, it is necessary to act in a manner guaranteeing optimal level of cooperation amongst the various entities of first-responders. At the federal level, the Department of Homeland Security acknowledges the importance of local emergency response and thus, has created a system by which it allocates funds for the construction and maintenance of emergency response services. Federal money is designated to the state and then filtered to local governments. The state's main function is administration and fund allocation; primary responsibility of implementing emergency response programs falls on local governments. However, once received, local governments vary on their spending. This allows individual jurisdictions to invest in a manner that maintains low operability with neighboring municipalities. In such instances, response efficiency is lost. For example, adjacent local governments may invest in identical emergency programs to prepare for biological attack. However, this duplication is a) a misuse of funds, and b) may decrease response time due to miscommunication amongst first responders. In order to combat obstacles associated with the current methodology in the state of Georgia, our proposal establishes a system that ties funding to the adoption of mutual aid legislation. In order for municipalities to receive funding, they must administer measures of local cooperation to ensure a maximum level of efficiency in response to terrorist attacks.

Reforming Subsidies in the Federal Budget

William Patrick Dever, Roosevelt @ UGA

Dr. William Lastrapes, Department of Economics, University of Georgia

The U.S. government allocated approximately \$52.52 billion in subsidies in 2006, accounting for 3 percent of total government expenditure. Many of these subsidies, though, actually reduce social welfare because of a lack of information and political lobbying. The U.S. government fails to properly assess the costs and benefits of every subsidy because the information required to do so often is too costly to obtain. In addition, subsidies greatly benefit a small group, giving them an incentive to lobby and provide campaign contributions to politicians, which can often influence the outcome of a vote, regardless of the social benefits or costs of the subsidy. Through detailed analysis of economic markets, this report illustrates the economic effects of both proper and improper subsidies and proposes the creation of an independent Subsidy Review Board (SRB). A twelve-person panel, with one member representing each of the twelve Federal Reserve districts, will lead the organization. All subsidies will be evaluated on the regional and national level under the specific criteria established in this report. This proposal will eliminate information asymmetries, because firms wishing to obtain a subsidy will have to present a detailed report on the societal benefit of the subsidy to the SRB, which will shift the information costs from the government. Furthermore, an independent Board will not be as susceptible to political or socio-economic pressures as individual legislators. A reformation of the federal subsidy process will eliminate billions of dollars from the federal budget each year and direct better allocation of the remaining funds.

U.S.-China Energy Cooperation: A Step toward Greater Environmental Cooperation

John T. Dixon, Roosevelt @ UGA
Dr. Rhett Jackson, Department of Forestry,
University of Georgia

Even as global warming receives an increasing share of public debate, the world's largest contributors to greenhouse gases, the United States and China, are also two of the most reluctant countries to take action against climate change. The United States has long been the global leader in energy consumption, but China's stunning growth requires that it consume ever-increasing amounts of oil and coal. Unfortunately these sources of energy are some of the worst sources of greenhouse gases. Reviewing current policies and research in the field exposes the lack of effort and ability to factor climate change into energy plans. Any serious attempt to conquer the energy challenges of our time will require serious effort, cooperation, and leadership from both of these countries. To remedy the stark inadequacies in current climate change policy, the United States and China must enact policies to increase nuclear power cooperation and improve clean coal technology. Both governments should support these technologies, as they will require government investment to reach an adequate scale. The two countries will also have to consult each other to shape laws and build government agencies tasked with managing the push for a cleaner environment. Understanding institutions and trends in both countries allows us to create better policies to encourage cleaner growth through nuclear power. Cooperative efforts can build trust and solidarity between the United States and China, and both countries will benefit from technological improvements that will allow them to wean themselves off of oil and coal.

Metabolic Studies in *Toxoplasma gondii*

Melissa D. Docampo
Dr. Boris Striepen, Department of Cellular
Biology, University of Georgia

Toxoplasma gondii is a protozoan parasite causing severe disease in immunocompromised patients and fetal disease during pregnancy. This pathogen harbors a chloroplast-like organelle named the apicoplast. We are interested in the metabolic functions of this organelle as targets for parasite specific drug development, because the organelle is absent in human cells. The route we have taken to analyze the value of individual targets is to construct genetic mutants. In this study we have begun to analyze how mutants deficient in apicoplast metabolism and protein import are affecting the metabolic state of the parasite. The gene chosen for the pilot study encodes acyl carrier protein (ACP), which is important for fatty acid synthesis. This is essential for the parasite's growth. We grew the mutants and parental strains for six days, and then extracted the cells with chloroform and methanol and separated the extract into organic and aqueous phases to perform metabolomic studies. These studies were performed by mass spectrometry. A decrease in fatty acids was observed in the ACP mutants. One of the most interesting changes was the presence of very high levels of gamma aminobutyric acid (GABA), which is known to be involved in a stress pathway in plants. Based on our metabolomic studies, we are also building a larger and more representative model to fully understand the contributions that different synthesis routes make to the overall fatty acid metabolism of the parasite.

Two Faced Politicians: Political Supply versus Constituent Demand in Health Rationing Policy

Rachel M. Dolan
Dr. Anthony Bertelli, Department of Public
Administration & Policy, University of Georgia

Recently the policy of the National Healthcare Service (NHS) in the United Kingdom has created controversy as well as increased public

interest and concern in its efforts to cut costs and increase efficiency through so-called “health rationing,” deciding objectively the recipients of health care. With an increase in concern also comes an increase in demand for representation pertaining to health and the NHS by constituents concerned with the state of their healthcare. However, demand for representation of interest by constituents does not always mean that their Members of Parliament (MPs) will supply it because MPs juggle conflicting interests: those of universal benefit versus particular benefit, those of the political party as well as those of the constituency (Norton and Wood 1993). This paper explores the “two faces,” the face of the party as well as that of the constituents, in relation to the topic of health rationing, a topic with political implications, to determine the consequences and possible ramifications caused by these competing interests. This paper proposes constituents’ interests are represented by MPs asking questions and that those of greater risk of rationing get questions asked on their behalf. Furthermore, per Norton and Wood (1993), newer MPs are more likely to represent the interests of their constituents in an effort to build electoral support. By examining questions put to the Secretary of State for Health from 1998-2005, the attention to the issue by MPs can be determined because the questions are a public forum in which backbench MPs, those without leadership positions, can easily claim credit for addressing issues of importance. Using the number of health rationing mentions in the questions asked by MPs to the Minister as the dependent variable and juxtaposing a number of factors, including constituency demographics and political factors such as seniority, this paper endeavors to discover the effect of each on Parliamentary attention to health rationing.

Roswell Voices: Oral History and Linguistics in Roswell, Georgia

Joshua A. Dunn, CURO Summer Fellow
Dr. William Kretzschmar, Department of Linguistics, University of Georgia

The Roswell Voices project emerged as a joint project of oral history and linguistics between

the Folk and Heritage Bureau of Roswell, Georgia, and faculty and students of the University of Georgia. The stage of research presented here is a continuation of this program and focuses solely on the language of the youth of Roswell, those within the 18 to 35 year old demographic bracket. I examined the question of how the language of a speaker contributes to his cultural identity in relation to Roswell, a localized question but one whose methods and results can be applied to study a broader scale. I implemented a three part interview, a method inherited from the existing study. Part one entailed a one hour conversation-style interview; part two consisted of the speaker reading certain words from index cards; and the third part involved the interviewer asking questions aimed at a certain lexical response. I conducted, transcribed, and analyzed four interviews by counting features generally associated with Roswell’s geographic location. After performing feature counts on data collected previously on two older age brackets, results suggest that the data collected not only characterize generation specific speech, but also define the youth of Roswell as being definite “southern” speakers, as can be determined from the prevalence of accepted “general southern” speech characteristics, despite the lack of further regional specificity. My plans for future study include tracing the history of certain recorded pronunciations and lexical responses, both in previous data and that collected for this project.

Antibody Extraction

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

The post-translational modification of cytosolic proteins at serine and threonine residues with the sugar N-acetyl glucosamine (GlcNAc) has been demonstrated to play a major role in regulatory processes. For example, elevated levels of O-GlcNAc have been directly correlated in humans and mice with insulin resistance, the hallmark of Type II diabetes, while in the model system *C. elegans* it has been tied to an extended lifespan. This dynamic process referred to as “O-

GlcNAcylation” occurs via the addition and removal of GlcNAc molecules on target proteins by the enzymes O-GlcNAc transferase (OGT) and O-GlcNAcase (OGA), respectively. Successful antibody recognition of OGA and OGT is a powerful tool for understanding the mechanism of O-GlcNAc structural alteration within a cell. My work has focused on purifying and characterizing antibodies that recognize either OGA or OGT. These IgY antibodies are generated in chicken egg yolks against synthetic peptides whose sequence was derived from the primary structure of either OGA or OGT. This approach was used in order to minimize the possibility of non-specific recognition to other proteins and potentially allows us to generate very large amounts of the antibodies, which can be used in a wide variety of tissues and cells from various species. Antibody extraction is performed through IgY Eggpress Purification Kit protocol, in which separate reagents are used for delipidization and protein precipitation. Following successful enrichment of antibody 352, Western Blot analysis confirms specific recognition towards over-expressed OGA lysate. Endogenous recognition of extracted 352 has not yet been confirmed, potentially requiring additional antibody purification. Antibody 470 that is proven to successfully recognize OGT remains in preliminary extraction and Western Blot efficiency stages. Once extraction and enhancement for OGA and OGT is complete, antibodies 352 and 470 will be used for further scientific research involving O-GlcNAc post-translational modifications that play major roles in intracellular behavior.

Cataloging Biodiversity: Filling in the Gaps for Coastal Ecuadorian Herpetofauna

Andrew M. Durso

Dr. Paul Hamilton, Department of Biological Sciences, University of Georgia

Jonathan M. Pahlas, Department of Biological Sciences, University of Georgia

The coastal forests of Ecuador are some of the most diverse ecosystems on Earth. Identified as a Global Biodiversity Hotspot by Conservation International in 1999, the Chocó region has

suffered reductions in area of over 90% since aboriginal times. Concern for reptiles and amphibians which depend on these habitats has prompted efforts to collect data on their biodiversity, life history and interactions with other species and the environment. We provide data on community composition of herpetofauna in these imperiled habitats, and examine phenotypic variation in reptiles and amphibians for future studies of systematics and taxonomy, contributing to a five year data set. By building species accumulation curves for each site, we provide a measure of survey quality and to illustrate the potential difficulty of sampling rare and cryptic species in diverse tropical forest ecosystems. Such surveys are critical for conservation of biodiversity.

A Domitianic Predecessor to the Arch of Constantine?

Jason E. Dyer

Prof. James Anderson, Jr., Department of Classics, University of Georgia

Originally believed to be a product of Late Antiquity, the Arch of Constantine in Rome poses a unique set of problems regarding Roman topography. Though A. L. Frothingham’s controversial theories regarding a predecessor to the Arch of Constantine were initially rejected, recent evidence suggests that while re-appropriated and dedicated by Constantine, the arch bearing his name may have had a predecessor centuries earlier. This predecessor was likely Domitianic, and corresponds with this emperor’s grandiose building program and Roman topography during the Flavian dynasty. Isotopic analysis, the measurement of carbon and oxygen isotopes in marble samples, evidences that much of the Arch of Constantine’s exterior decoration was gleaned from early monuments, a common practice during the 4th century C.E., and indicates rapid construction. Such brevity could only be achieved, however, if a structure were already present. Furthermore, the Haterii relief, which is noted as providing an accurate depiction of Roman topography, features an earlier triumphal arch where the Arch of Constantine now stands.

When considered with field of view analyses and Roman topography, the numismatic evidence, once used to counter the theory of such a predecessor, has proven to be flawed. Indeed, the presence of such an arch under Domitian in this location would correspond with the Triumphal Route and larger Flavian building program. Taken as a whole, evidence indicates that the possibility of a Domitianic predecessor to the Arch of Constantine requires further consideration.

Sex-Related Differences in Pain Experience in Marathon Runners

Jessica E. Dyke

Dr. Patrick O'Connor, Department of Kinesiology and Department of Exercise Psychology, University of Georgia

The purpose of this study was to compare women and men on their pain experiences caused by a marathon run. Over 1000 marathon runners completed an online survey. The data base was examined for pairs of men and women who could be matched on four pain-related variables: the average number of days per week the participant trained for the marathon, the marathon course run (e.g., Boston marathon course), the relative intensity at which the marathon was run as indexed by the overall rating of perceived exertion and the highest intensity of pain ever experienced. Marathon related pain reports from 31 men and 31 women were compared using t-tests. Women reporting experiencing pain significantly earlier during the marathon (mean pain threshold was at 14.3 miles for women and 17.9 miles for the men, $p < .01$). Women reported experiencing significantly higher intensity pain 1 to 3 days after the marathon using a 0 to 10 pain intensity scale (female mean: 6.1; male mean: 5.1, $p < .05$). These findings are generally consistent with prior research on sex-related differences in laboratory pain showing that compared to men women report on average a lower pain threshold and a higher pain intensity in response to the same noxious stimulus. This study is among the first to analyze sex-related differences in pain experienced during the extreme conditions that

are self-imposed during a marathon. Sex-related differences in pain during and after a marathon have potential relevance for optimizing the training, performance and treatment of marathon runners.

Rethinking the U.S.'s Relationship with the Global Poor: A Restructuring of USAID's Microfinance Efforts in Africa

Ellyn A. Echols & Jeremy Akin, Roosevelt @ UGA

Dr. Glenn Ames, Department of International Public Service and Outreach, University of Georgia

As Africa's strategic importance on the global stage increases and other major powers such as China take notice, it is time for the United States to consider the future of its own economic role in the continent. We examine USAID's current partnership with Africa in its support of microfinance institutions that are locally operated and intended to reach the very poor. Microfinance techniques can be powerful catalysts of development in third-world countries because they economically equip households by giving small, low-interest loans to entrepreneurs in order to establish and maintain small businesses—strengthening the very base of a stable economic system. We assert that it is in the best interest of the United States to reevaluate and enhance its anti-poverty measures via a more effective implementation of microfinance in a continent that has traditionally been overlooked. By renewing its emphasis on partnerships with existing organizations, restructuring its loan system, and by significantly improving representation of Africa in its microfinance efforts, USAID will more effectively move toward its goal of poverty eradication. These reforms will also foster a better environment for global trade, a more stable continent, and the potential for greater democratic cooperation among U.S. and African governments.

Increasing Trade Security: United States-Venezuelan Trade Incentives

Nathaniel T. Edwards, Roosevelt @ UGA
Dr. Christopher Allen, Department of
International Affairs, University of Georgia

Trade with Venezuela has risen to the top 15 nations with which the United States conducts trade; it has also become the fourth largest provider of American crude oil and petroleum products, topping over a million barrels every day. While trade with Venezuela has steadily increased, diplomatic relations have steadily declined due to open antagonism and criticism by both sides. In juxtaposition, there is a significant national security threat as Venezuela becomes a prime locale by which to load a weapon on a boat intended for American ports and Venezuela offers little domestic protection of exports to America. This risk is becoming even greater as Chavez continues to increase relations with American adversaries and openly critiques American capitalism. As trade relations increase, each state can demand a greater level of security be met and maintained in order for trade to continue. Therefore, this paper proposes the creation of a system of economic incentives in exchange for meeting and maintaining security standards at ports. Because there is a risk of Venezuelan hesitance to participate, the policy aims to appeal exclusively to the economic sector of Venezuela and avoid political confrontation. Furthermore, it aims to avoid Chavez' criticism of capitalism by establishing a controlled economic system between the United States and Venezuela. This policy will be rationalized by comparing similar case studies as well as noting inherent benefits of trade systems.

Environmental Factors Affecting the Persistence of Avian Influenza Virus in Water

Christina L. Faust
Dr. David Stallknecht, Department of Wildlife
Disease Study, University of Georgia

Transmission of avian influenza virus (AIV) is dependent on an indirect fecal-oral route

involving fecal-contaminated water; however, little is known about the persistence of AIV in aquatic environments. Although studies have shown that temperature, pH and salinity affect the infectivity of AIV in water, biological factors have not been considered. The objective of this study is to examine the influence of filter feeding bivalves on the persistence of AIV in water. Freshwater clams, *Corbicula fluminea*, were used as model organisms and placed into individual tissue culture flasks (n=42) filled with distilled water that was inoculated (1:100) with low pathogenic AIV. Water samples were taken a minimum of three times during 48 hours, and after each trial the clams were processed for in situ hybridization. The virus titer (amount of virus) of the water samples was quantified using microtiter endpoint titration. Over the 48 hours, the virus titer decreased (compared to control flasks) or was undetectable in water samples from flasks with filter feeders. The preliminary results of this study suggest that filter feeders, reduce the persistence, and thus infectivity, of AIV. In situ hybridization will be used to determine the location and status of AIV within clam tissue after filtration from the water column. Studying impacts of environmental factors, such as filter feeders, on the epidemiology of AIV will help develop an understanding of the maintenance of AIV within wild aquatic bird populations and aid in the management of AIV.

The Impact of Family Relations, Health Perceptions, and Parental Functioning on Adherence and Medical Outcomes in Adolescent Transplant Recipients

Nicole M. Fenton & Emily Osborn
Dr. Ronald Blount, Department of Psychology,
University of Georgia

While organ transplantation was once a last resort for terminally ill children, it has become the treatment of choice for individuals with a number of illnesses. Although the survival rate is high for transplant patients, their long term prognosis deteriorates due to patients not taking their medication in accordance with doctor's instructions (medication nonadherence). High

rates of nonadherence have been reported in pediatric populations, particularly during adolescence (Shaw et al., 2003). Not taking the prescribed immunosuppressant medications may result in a patient's body rejecting the transplanted organ. This study seeks to examine how psychosocial factors such as family relations, health perceptions and parental functioning relate to medication nonadherence and therefore medical outcomes. The present study was an 18-month longitudinal investigation of adolescent transplant recipients and their families. Participants in the initial cohort were 68 adolescents who had received a kidney, liver, or heart transplant and their parents. Each of these participants were re-contacted and measures of physical and psychosocial functioning, as well as medical records, were obtained. Based on the literature and findings from our initial cross-sectional evaluation, it is expected that high levels of family cohesion, low levels of family conflict and healthy parental emotional functioning will positively influence medication adherence and therefore medical outcomes 18 months later. The relationship between parent functioning and adolescent health outcomes is expected to be partially mediated by adherence. This study will identify risk and protective factors for health outcomes in adolescent transplant recipients, and help guide the development of interventions to improve health in this vulnerable population.

Cloning, *E. coli* Expression, and HPLC Enzymatic Assay Analysis of Putative Domains of Arabinose Kinase

Kathryn S. Flake, CURO Summer Fellow
Dr. Maor Bar-Peled, Complex Carbohydrate Research Center, University of Georgia

Nucleotide sugars are produced by three pathways: the sucrose, interconversion, and salvage pathways. The salvage pathway recycles monosaccharides released from either seed storage polysaccharides, wall reconstruction, glycoproteins, or glycolipids and converts them back into activated nucleotide sugars by means of over 20 differing sugar-1-phosphate intermediates. Identifying and characterizing all

salvage pathway enzymes are therefore critical steps in determining the contribution this pathway makes towards the nucleotide sugar reservoir. Arabinose kinase is an enzyme in the salvage pathway responsible for phosphorylating arabinose to arabinose-1-phosphate. There are discrepancies regarding the biochemical properties of the kinase, its subcellular localization, and its biological function, which must be resolved. The gene encoding arabinose kinase (*arak*) consists of two domains: a galactokinase-like domain, speculated to have kinase function, and a large N-terminus domain whose function is unknown. Therefore, using RT-PCR, we constructed and cloned several gene constructs expressing either the N- or C-terminal domains in addition to two versions of the protein (full-length or truncated $\Delta 50$) linked at their C-terminus to an EGFP reporter protein. The expression of the galactokinase-like domain and the truncated version of the N-terminus ($\Delta 50$) in *E. coli* were verified by SDS PAGE. Current study is aimed at defining the enzymatic properties of the various constructs using HPLC enzymatic assays. Additionally, biochemical analysis and determination of the subcellular localization will help in elucidating the activity of arabinose kinase.

Voltage-Dependent Anion Conductance (VDAC) Porin: A Possible Channel for Cytochrome c Release in Apoptosis

Ashley L. Foster, CURO Scholar
Dr. James Franklin, Department of
Pharmaceutical & Biomedical Sciences,
University of Georgia

Apoptosis, a type of programmed cell death, has been identified as a key component in several biological processes, including embryological development and neurological disease.

Apoptosis is necessary for maintaining tissue homeostasis by regulating the balance between cell growth and death. While unchecked apoptosis leads to degeneration, the inhibition of apoptosis leads to cancer. Determining the molecular mechanism of apoptosis will aid in understanding cellular processes and in future treatments of disease. The mammalian intrinsic

apoptotic pathway involves the release of apoptogenic factors, such as cytochrome *c*, from the mitochondrion into the cytoplasm through an unknown porin. This release activates a cascade of caspase proteases, DNA fragmentation, and ultimately cell death. A proposed mitochondrial channel for cytochrome *c* release is the Voltage-Dependent Anion Conductance (VDAC) porin that spans the outer mitochondrial membrane. Preventing the release of cytochrome *c* halts the apoptotic process. Thus, inhibition of the VDAC porin could potentially prevent cytochrome *c* release into the cytoplasm and the activation of the apoptotic cascade. The present study primarily used the non-specific inhibitor, DIDS (4, 4'-diisothiocyanatostilbene-2, 2'-disulfonic acid disodium salt hydrate), to block the VDAC porin. By fluorescence microscopy, fluorescence spectroscopy, survival experimentation, and immunocytochemistry, the activity of the VDAC porin in the apoptotic cascade was analyzed. My research, found that the VDAC porin is not the channel through which cytochrome *c* is released.

La Voz de los Sin Voz: The Use of Radio by the Zapatista Movement in Mexico

Erika D. Frank

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

This paper will explore the use of media by the Zapatista movement, focusing particularly on radio and internet radio. It will seek to explain exactly why these mediums were so effective and what impact they had on the movement from its beginnings in 1994 to the present. The Zapatista Army of National Liberation is a revolutionary indigenous group in Chiapas, Mexico. Their uprising in 1994 has been called the first “post-modern revolution” and has set itself apart from rebellions of the past. Since the uprising, the world has been watching the region and rebel leaders for clues as to what pattern revolution will take in our globalized society. The Zapatistas set themselves apart from other indigenous uprisings through their use of local and foreign media, particularly radio, to gain international visibility and to inform and organize their supporters efficiently. Radio is a

uniquely suited medium for this type of rebellion because it is accessible to their largely illiterate target audience, is inexpensive, and is elusive to government control. The paper will explore their media strategy through analysis of the audio archives of Radio Insurgente, the dominant station in Chiapas, and Radio Zapatista, a weekly Pacifica program recorded in Berkley, CA as well as interviews with station personnel and secondary sources. This analysis demonstrates the importance of radio to the strength and success of the Zapatista movement.

Vesicular Stomatitis in Cattle

Ryan M. Friday

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

Vesicular stomatitis virus (VSV) causes blistering in many large animals with lesions at specific sites. Outbreaks of VSV result in severe restrictions on movement and production. As such, the virus mostly poses a threat to the food animal industry. VSV is believed to spread via contact as well as through the bite of infected insects. It is believed that the black fly’s salivary gland extract (SGE) facilitates viral uptake and replication. Preliminary evidence for this theory lies in the difference in the number of virus particles lesion formation requires when cattle are artificially infected versus the amount required when the black fly is involved. When researchers set out to create a lesion, doing so requires the application of approximately 10,000 times as much virus as the fly carries. The objective of this study is to determine whether it is the presence of SGE or some other factor that allows the virus carried by the flies to be so much more effective. Reaching conclusions about the natural spread of VSV is important to veterinarians and farmers who must contend with it, as evidenced by the fact that this study is funded in part by the USDA. To test the possible magnifying effects of SGE, seven cows were infected along the coronary band with differing concentrations of VSV and SGE. Tissues were collected at varying intervals postinfection. Immunohistochemistry, a technique to detect the amount of virus within fixed tissue, was used to

assess the amount of replicating virus within the inoculated tissue.

Potential Novel O-N-acetylglucosamine Transferase (OGT) Downregulation Technique for *D. rerio*

Steven A. Gay, CURO Apprentice
Dr. Scott Dougan, Department of Cellular Biology, University of Georgia

The role of post-translational modifications such as phosphorylation in regulating developmental pathways has been studied extensively. However, little is known about the role of the post-translational modification O-N-acetylglucosamine (O-GlcNAc). Although studied extensively in plants and mammalian cell culture, the role of O-GlcNAc in animal development is not fully understood. Unlike other post-translational modifications occurring in the Golgi and the Endoplasmic Reticulum (ER), O-GlcNAc modification of nuclear and cytoplasmic proteins allows for its potential involvement in multiple developmental pathways. The addition of O-GlcNAc to a wide variety of nuclear and cytoplasmic proteins occurs by the enzyme O-N-acetylglucosamine transferase (OGT). In zebrafish, OGT is expressed ubiquitously in the first 24 hours post-fertilization before restricting to the head. Structurally, the OGT protein contains a C-terminus catalytic domain connected by a flexible connector to an N-terminus protein-binding domain. Tetratricopeptide repeats (TPRs) exist within the N-terminus domain of OGT, which in rats allows OGT to act catalytically as a homodimer. Due to the very high degree of OGT sequence conservation between species, we utilized the N-terminus TPR domain to design a dominant negative construct, zNOGT, to examine the role of OGT during zebrafish embryogenesis. When zNOGT mRNA was injected into embryos before the eight-cell stage, the embryos' development were delayed and displayed a wide variety of defects including severe growth retardation of the tail and head that we are currently characterizing. In the future, zNOGT will be a tool to assess OGT

function in later stages of zebrafish development such as development of the head.

Association Between Infant Feeding and Overweight/Obesity in Ghana, West Africa

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

Obesity has rapidly become a leading public health issue around the world, including developing countries. A number of studies have shown an association between the type of infant feeding and overweight/obesity among mothers and their children, especially in the developed countries with limited data from developing countries. This data was generated from a needs assessment study conducted by UGA students participating in a service-learning program in Ghana, West Africa during the summer of 2007. The purpose of the study was to assess breast feeding and infant/child nutrition practices in relation to overweight/obesity. Mothers with a child five years or younger participated in the study. The mean age of the mothers was 27.39 years with an average of 9.56 years of formal education. Majority of the mothers exclusively breast fed the index child for six months or less. Mothers with more years (> 10 years) of formal education exclusively formula fed their children. Further analysis of the data showed a relationship between the type of infant feeding and maternal BMI with those who exclusively formula fed having a higher BMI. There was an inverse relationship between years of maternal education and both maternal and child BMIs. The data also shows that children who exclusively breastfed had a lower BMI. In conclusion, our results show that mothers who practice exclusive breastfeeding have a lower postpartum BMI compared to their counterparts who practice mix feeding or exclusive formula feeding. A similar trend was found among the children.

Characterizing the ‘Small Proteome’ in the Hyperthermophilic Archaeon *Pyrococcus furiosus*

James T. Gordy, CURO Summer Fellow, CURO Scholar

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

The archaeon *Pyrococcus furiosus* (*Pf*) is an anaerobic hyperthermophile originally isolated from a geothermal vent on a seabed near Italy. It grows optimally at 100°C, the normal boiling point, and as a consequence its enzymes have a lot of potential for high temperature applications. Many of them have been characterized, but due to inherent difficulties in extraction and isolation, little data is available from the low molecular weight proteome (under 15 kDa) of this organism. The goal of this project was to create a method that could generate small proteins in high enough yield for further analyses. All steps were performed anaerobically to preserve the integrity of oxygen-sensitive proteins. The cytosolic fraction of *Pf*, prepared by high-speed centrifugation of sonicated cells, was analyzed by gel filtration chromatography. The fractions were analyzed for protein and metal contents, and by native and SDS-denaturing gel electrophoresis. Using a Superdex 75 column, which fractionates in the molecular weight range from 3 - 70 kDa, the small proteins (< 15 kDa) were separated from the larger proteins. Anion-exchange chromatography (Bioscale Q2) was used for further separation. In order to yield sufficient amounts of the so-called small proteome for further analysis, a larger amount of cell paste (>10g) needs to be used as the starting material. The optimized procedure for obtaining the small proteome for further analysis will be presented and discussed.

Sketches in Noir

Brian Graiser

Dr. Leonard V. Ball, Jr., Department of Music Theory & Composition, University of Georgia

Sketches in Noire, written in 2007, is a multi-

movement work akin in spirit to the “film noir” genre, representing in sound a dramatic and somewhat bleak story. The names of the seven movements supply the storyline: The Twilight Fog Rolls In; The Heist; The P.I.’s Office (Some Snappy Dialogue); The Woman by the Docks; The Social Club; The Cement Overcoat; and On the Lam/Fin. The CURO Symposium program will feature three of the movements.

Brian Graiser, Vibraphone



The People

Adam Gruszynski

Prof. Ted Saupe, Department of Ceramics, University of Georgia

Prof. Sunkoo Yuh, Department of Ceramics, University of Georgia

Lately I have been exploring different ways to express myself through clay. I build each sculpture quickly to create a gesture. Later I carve, scratch or throw thin slabs of clay on the surface. It is important to have every part of the process make its own visual mark on my work. To enhance the texture I use multiple amounts of stains and apply glazes in specific areas to contrast the rawness of the clay. I work mainly with stoneware and use multiple firing techniques such as salt, raku, electric, and gas.

The People, 2007. Porcelain glazed.

The Tower, 2007. Stoneware and porcelain glazed.

Nancy, 2007. Stoneware and gas reduction.

Hispanic Music in Athens, Georgia

Jana M. Hanchett, CURO Summer Fellow
Dr. David Schiller, Department of Musicology & Ethnomusicology, University of Georgia

The Athens-Clarke County police department estimates that 5% of the Athens population is Hispanic or Latino. This 5% consists of 20,000 individuals who are often marginalized from the Athens community due to language barriers and immigration statuses. I propose that musical experiences shared between Hispanic/Latino musicians and the Athens community will encourage social cohesion. Athens already accepts the sounds of Latin music (for example, Grogus, Cachaça, Moyuba, and salsa nights at downtown venues), but these groups consist primarily of Caucasian musicians and do not represent the voice of Athens' Hispanic/Latino immigrants. Consequently, my research centered on discovering what and where Hispanic musicians are playing in Athens. My initiation into fieldwork began on June 3, 2007, at a fiesta celebrating the Feast of the Trinity at Pinewoods Estates. Here I met IncaTepec, a music group made of two Mexican brothers, Noe and Humberto Mendoza. From them I also learned of Banda Kazador, another music band who practices popular Mexican music behind a community tienda. My fieldwork included interviewing these Mexican musicians, video recording and transcribing examples of these

musicians' works, photographing the musicians within their musical environment, and playing their music with them. My objectives were threefold: 1. describe the music of IncaTepec and its function in Athens 2. describe the music of Banda Kazador and its function in Athens 3. compare and contrast IncaTepec with Banda Kazador. As cultural mediators, both groups combine American elements with Mexican music, but their music reveals two very different concepts of bridging cultural boundaries.

Corticosterone and Its Effects on Stress-Induced Weight Loss

Samantha J. Haring

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

Rats exposed to repeated restraint (RR) stress, which is placement in a tube for three hours on three consecutive days, show a prolonged reduction in body weight. One hormonal response to stress is an increase in circulating corticosterone, a steroid hormone released from the adrenal glands. To determine if weight loss caused by RR is dependent on corticosterone, we performed a study with rats in which adrenal glands had been removed (adrenalectomized) eliminating their normal production of corticosterone. Adrenalectomized rats were separated into both RR and control groups, and the RR rats were divided into those that received corticosterone versus saline injections. The rats with intact adrenals were separated into two groups, RR and control. Blood samples were collected during stress to ensure that corticosterone injections replicated stress-induced corticosterone release.

Adrenalectomized RR and control rats that received corticosterone maintained a reduced body weight after stress. The adrenalectomized RR rats that received saline lost less weight than the other groups of RR rats and regained the weight loss after stress. The adrenalectomized control rats that received saline showed little weight change. These results suggest that corticosterone is effective in resetting body weight without RR and also that RR-induced weight loss requires corticosterone release. We

now suggest that corticosterone, during RR, is important for the rats to achieve and maintain a reduced weight.

The Diplomatic Face of America: Promoting Diversity in the U.S. Foreign Service

Cain Harrelson, Roosevelt @ UGA

Dr. Kaye Sweetser, Department of Advertising & Public Relations, University of Georgia

The United States has long been represented abroad by socio-political elites, uncharacteristic of this country's richly diverse population. While legislation mandates active minority recruitment and retention across federal agencies, these efforts rarely produce substantial results. In fact, only 13 percent of the diplomatic corps comes from a minority background, while 40 percent of the overall American workforce is comprised of racial minorities; such trends are indicative of continually declining minority employment in crucial diplomatic roles. This work confirms prior research on diversifying the U.S. Foreign Service, with particular emphasis on how the lack of minority representation distorts policymaking; how diverse backgrounds and experiences translate into innovative foreign policy; and how racial diversity may positively shape the image of America abroad. In extending previous research, this work evaluates the impact of racial composition in influencing public opinion in volatile regions of the world, particularly since the beginning of U.S. involvement in Afghanistan and Iraq. Making use of Allan Goodman's initial model in addition to formative theory of diversity in public relations, the resulting policy proposal seeks to build a more representative diplomatic corps, incorporate broader ideological diversity, and improve public affairs abroad. Accordingly, the Department of State policy must expand its efforts in the recruitment of qualified racial minorities, and senior leadership must enhance the overall organizational culture by actively supporting underrepresented groups pursuing leadership positions in order to advance foreign policy objectives and public diplomacy strategies.

Newcastle Disease Pathogenesis

Laura M. Harrison, CURO Summer Fellow
Dr. Corrie Brown, Department of Pathology,
University of Georgia

Exotic Newcastle Disease Virus (ENDV) is one of the foremost threats to the poultry industry. Virulent viruses can quickly sicken and kill an entire house of chickens. Presence of any virulent viruses within our country will seriously damage our abilities to export chicken meat or live birds. The last outbreak of Newcastle disease in the US happened in California in 2002-2003. That outbreak claimed the lives of 4 million birds, required 8 months to eradicate the virus, and cost over \$300 million dollars to the industry. An enhanced understanding of the pathogenesis of the disease, that is, which organs are predominantly infected, and how that damage occurs, would help greatly in devising better vaccines and overall control procedures. With this study, immunohistochemistry for the viral nucleoprotein was performed on tissues of experimentally infected animals with the viral strain from the 2002 ENDV outbreak in Australia. Further analysis of pathogenesis was done through immunohistochemistry for inducible nitric oxide synthase, a key component in inflammation, and active caspase 3, an indicator of apoptosis. Viral nucleoprotein was detected in brain, intestines, cecal tonsils and spleen. Lymphoid tissue in the intestine had greatest nitric oxide synthase and active caspase 3 expression, as compared to negative controls. These preliminary results will be helpful in leading to a better understanding of the host response to the NDV infection.

The Road to Violence: Nonviolent v. Violent Actors in Bangladesh

Clare J. Hatfield, CURO Summer Fellow & Maggie Mills

Dr. Mia Bloom, Department of International Affairs, University of Georgia

This project explores behavioral relationships among state, violent nonstate, and nonviolent nonstate actors in Bangladesh from 1980-2005. The authors ask whether government policies

directed towards violent and nonviolent dissident groups result in different responses by various nonstate actors. To answer the question, they develop several hypotheses. To begin, if the government targets nonviolent social actors with the same repressive policies it employs against violent dissident groups, the otherwise nonviolent actors should respond with increasingly hostile behavior. Second, the theoretical model suggests that the wider population mobilizes into both violent and nonviolent dissident groups. The authors will disaggregate dissident groups into violent and non-violent groups, separating social actors such as labor and student unions from rebel and terrorist groups. Previous studies largely ignore such non-violent group interactions or aggregate such groups' tactics together with rebel and terrorist groups' tactics. Others explore how violent groups' interactions or competition over resources can lead terrorist organizations to ramp up the use of violent tactics (Bloom, 2005). This study is the first to examine whether the same types of state policies directed at violent groups similarly affect or even provoke violent responses from otherwise nonviolent actors. Preliminary findings reveal that government interactions with nonviolent groups oftentimes serve to mobilize the wider population into both violent and nonviolent groups and movements. If the final data supports the authors' hypotheses, the results will imply that the government's use of equally repressive policies across all groups inspires increased violence within the state, and that the government needs to both tailor its policies towards the type of group it wishes to target and accommodate forms of nonviolent protest.

Book of Trees

Soujourner Hodges

Dr. Adrian P. Childs, Department of Music Theory & Composition, University of Georgia

Book of Trees is a five-movement work, each movement bearing the name of a tree: Juniper, Oak, Elm, Cottonwood, and Maple. It is an attempt to capture the natural and folkloric characteristics of specific trees. I will perform

Juniper and Maple at the Symposium because of their energy and vibrancy. With Juniper, I tried to represent a dark evergreen, simultaneously mysterious and filled with life. With Maple, I simply tried to convey the slightly chilly, yet brilliantly colorful atmosphere of the maple tree.

Soujourner Hodges, Piano

Solving Rubik's Cube: Artificial Selection in Higher Education

Mary K. Holder, Marcia A. Cole, Bette' S. Ford, Destiny L. Murray

Dr. Farooq Khan, Department of Chemistry, University of West Georgia

Rising education costs have increased demand for a formula for student success, but prior research has taken a retrospective view, examining successful students and looking back for common characteristics. In contrast, the purpose of this study is to find determinants for cognition, the mental process necessary for learning, in order to predict and forecast a student's propensity for future success. Our study asks: in higher education, might genetic, environmental or socioeconomic factors exist that could provide a student with a relative fitness advantage and are any of them intrinsic or unchangeable? Using the Rubik's cube as a test of student success allowed us to quantify cognition as a percent of the cube correctly solved. Random samplings of the 10,000+ University of West Georgia student body were taught a specific solution method by our interdisciplinary research team of science, social science and business majors. Approximately 200 students participated in our study which consisted of completing surveys, undergoing instruction and timed pre- and post-assessments. Ordinary least squares multivariate regression analysis will determine if our variable of interest, cognition, varies with any determinants at a statistically significant level. Previously, a small pilot study indicated that learning style, evaluated via questionnaire, may be the best predictor of student cognition which is supported by other research studies. However, learning style inventories are highly

controversial in the field of educational psychology and settling this debate is outside the scope of this project. What we do hope to provide is additional evidence of the amount of correlation between learning style and student success. Regardless of the findings, the uniqueness of this study is in the measurement tools used, the types of information collected, and the research team involved which lends a different perspective on student cognition and success.

The N-Word and Its Implications on a Predominately White Campus

Erica Holland, CURO Apprentice
Dr. Robert Pratt, Department of History,
University of Georgia

Since the arrival of Africans into Jamestown, Virginia in 1619, one word has evolved over time to be used as a derogatory term for African-Americans: nigger. Today the word "nigger" which has been represented as a term of hatred and bigotry, has penetrated the worlds of hip hop and mainstream media, with racial incidents being more prevalent than ever. Even with its disparaging connotation, African Americans today continue to use this word as a term of endearment amongst other African-Americans in the form of "nigga" causing unspoken confusion within the African-American community and the non-African American communities. College students are perceived to be educated people. But are these college students truly educated on the word "nigger"? How do college students, both African-American and non African-American, use this word? Who taught these college students the definition/connotation of what this word really means? Was the formal burial of the word "nigger" truly effective in banishing this ugly term? How do these various racial groups on campus view this offensive word? Are there racial incidents on campus in which African-Americans are being called nigger" and are not reporting it? Through the dissemination of surveys to African-Americans, these questions of what this word means to African-Americans will be answered. The results may show that African-Americans do not

want others of different ethnic origins to use this word, yet they still want to use it.

Using Surface Enhanced Raman Spectroscopy for the Detection of Pathogens

Anna E. Hudson, CURO Summer Fellow
Dr. Richard Dluhy, Department of Chemistry,
University of Georgia

A rapid and sensitive method for detecting pathogens is greatly needed. Surface Enhanced Raman Spectroscopy (SERS) has emerged as a powerful analytical technique because the scattered Raman signal is characteristic of the composition and structure of the pathogen. In SERS, the incoming laser interacts with metallic nanorods on a substrate to enhance the signal of the molecules adsorbed to the surface by an observed factor of $\sim 10^9$. Previous studies demonstrated the sensitivity and specificity of SERS, but the method has been limited by the reproducibility of highly ordered nanorod arrays and the complexity of the spectra. In response to these limitations, oblique angle vapor deposition (OAD) has been used to fabricate reproducibly sensitive silver substrates and chemometrics has been used to analyze the complex Raman spectra. To demonstrate the use of SERS as a bioanalytical technique, the OAD prepared substrates and chemometrics were used to identify and classify three strains of *Mycoplasma pneumoniae*, which is a major cause of respiratory disease in humans. Using principal component analysis and hierarchical cluster analysis, 95% of samples were correctly identified and classified by strain. This study has shown that OAD is capable of fabricating reproducible SERS substrates with high enhancement factors that can be used as biosensors. It has also shown chemometrics can correctly classify the strains of mycoplasma suspended in water with high accuracy. These results suggest SERS can be used as an inexpensive, rapid, and accurate method for detecting low levels of pathogens in water and possibly in media.

The Ecology of Enteric Bacterial Isolates in San Luis, Costa Rica

Natasha A. James, CURO Apprentice
Dr. Susan Sanchez, Department of Infectious Diseases, University of Georgia

The importance of ecotourism in Costa Rica has led to conservation efforts such as sustainable agriculture that will promote avian diversity. The development of sustainable agriculture in the form of shade grown coffee plantations has presented a unique interface between domestic and wild animals, which is an unknown frontier in disease ecology. However, these shade grown coffee plantations are being inhabited by humans and their domestic animals which include free-roaming chickens. It is known that free roaming chickens have been found to have a high prevalence of common poultry pathogens, however little information exists on the health risk that these plantations pose for free roaming birds. This study was conducted to investigate the antimicrobial resistance profiles of *E. coli* isolates of wild bird and free-roaming chickens living in coffee plantations and wild birds living in forested habitat. We hypothesized that *E. coli* isolated from chickens and birds living in human-impacted areas would have a higher prevalence of antimicrobial resistance due to horizontal transfers of bacterial genetic material from human waste and chickens. Fecal samples were collected and cultured. Bacterial isolates were identified and their resistance to a variety of antibiotics was determined. PCR was utilized to identify the genes that would confer this resistance. The general trend showed that *E. coli* isolated from chickens display a higher prevalence of antimicrobial resistance. Our data however, indicate there is no significant difference between antimicrobial resistance of the wild birds in the coffee plantations and those from the forest, thus disproving our hypothesis.



Residue Brooch

Kathleen Janvier
Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

My present work stems from the intersection between an alternative materials study and an investigation into the tradition of historical reinterpretation. Simultaneous research into the formal qualities of plastics coupled with an interest in the aesthetic and conceptual functions of Edwardian jewelry quickly lead to the combination of both in this contemporary analysis of jewelry as image. The Edwardian period, or la Belle Époque, was known for its commitment to elegance and fashion. As industry began to rise, so too did the extravagance of the upper and middle classes who soon turned to fashion, especially jewelry, for visual suggestions of their opulent lifestyles. Elegance was associated with a delicacy of materials, a monochromatic white on white aesthetic, and an airy weightlessness. White

diamonds in barely perceptible platinum white settings surrounded by intricately laced decorative motifs became the dominant elements of acceptable Edwardian adornment and still remains a popular aesthetic choice for those wishing to call attention to their wealth and social status. The notion that this aesthetic can and does relate the same set of values today that it did one hundred years ago begs an investigation into the function of jewelry as an image of opulence and elegance. By using sterling silver chain as the drawing medium in creating loose ephemeral silhouettes of actual Edwardian artifacts, I attempt to expose the transient qualities of the image, which captures only a single instant in time that cannot be recreated but whose record remains locked in the physical presence of the visually experienced image. The frame surrounding these chain-drawings works to emphasize the function of these pieces as images of jewelry before they are seen as wearable pieces themselves. Lastly, the decision to use a lightweight, white plastic stemmed from a desire to recreate the white on white aesthetic of Edwardian jewelry while at the same time encasing and freezing the chain drawing in its transitive state of being so that the loose thin edges of the plastic relate a freshly torn feeling from some jeweler's sketchbook of a piece yet to be created.

Materials: Plastic, Sterling and Fine Silver

The U.S. Intelligence Community Must Become Centralized

Alexander B. Johnson, Roosevelt @ UGA
Dr. Loch Johnson, Department of International Affairs, University of Georgia

Preventing intelligence failures like the Pearl Harbor and al Qaeda attacks on American soil is the major motivation for bringing cohesion to the United States' intelligence community (IC). As the Soviet Union mounted a new threat against America, President Harry Truman sought to organize and unify the nation's intelligence with the creation of the CIA in the National Security Act of 1947 in order to better protect its citizens. The terrorist attacks of

September 11, 2001 illuminated for lawmakers the continuation of the same problems and served as an impetus for IC reorganization in order for America to counter its new threat. Consequently, President Bush signed the Intelligence Reform and Terrorist Prevention Act (IRTPA) into law on December 17, 2004, thus creating the Office of the Director of National Intelligence (ODNI). Unfortunately, this legislation has failed in its purpose to increase efficiency and only added a layer to the already large bureaucracy. The Department of Defense and its supporters in Congress exercised its formidable power and provided the politics responsible for the [less effective] ODNI. Therefore, this policy proposal will address the shortcomings of the IRTPA through proposing IC reorganization legislation that enables cooperation among agencies. Under the amended law, an empowered DNI would have full budget and appointment powers and, therefore, the ability to manage and lead the entire IC. To support the merits of this policy, analysis will be presented from texts written by intelligence and military experts, former intelligence officials, congressional research, and contemporary media outlets.

You Are What You Eat: Mandating Point-of-Purchase Nutrition Information in Georgia Restaurants

Kelsey A. Jones, Roosevelt @ UGA
Dr. Marsha Davis, Department of Health Promotion & Behavior, University of Georgia

The prevalence of obesity in the United States has prompted the U.S. Surgeon General to declare it an epidemic. This alarming trend relates to changing consumption patterns, as Americans increasingly eat restaurant foods that contain more calories, fat, and sodium than at-home alternatives. Georgia—a state with one of the highest levels of obesity-related morbidity—has yet to enact policies to prevent obesity among its citizens. The Georgia Assembly should mandate that restaurants place nutrition information on all menus to improve Georgia consumers' ability to make healthy meal decisions. In addition, the Georgia Division of

Public Health should create a complementary educational initiative; this advocacy program will encourage healthier diets and instruct consumers on how to use this new information effectively. Even health-oriented consumers have difficulty assessing the nutritional value of a restaurant meal, often vastly underestimating its contents. Moreover, this lack of information fails to hold restaurants accountable for the calorie-dense materials they use to prepare foods. Enacting point-of-purchase nutrition labeling legislation would enable individuals to make healthier food choices and compel restaurants to offer meals of greater nutritional value. The motivation for the Georgia legislature lies in the potential annual savings of \$2.1 billion spent on the obesity health burden and the favorable public response to similar proposals in other states. Research could examine the relationship between the successful implementation of the policy and weight trends in Georgia. If the policy is found to be effective, the nation could benefit from Georgia's efforts to discourage an obesogenic environment.

Duet of Soprano and Bass Clarinets

Brandon Kaufman

Dr. Roger Vogel, Department of Music Theory & Composition, University of Georgia

Duet for Soprano and Bass Clarinets was written in February 2008 to provide the composer and clarinetist Kim Nogi with a new composition to premiere on their joint recital in April. The mood is cheerful and contrapuntal with the main themes elaborated by both the high and low instruments.

Brandon Kaufman, Soprano Clarinet

Kim Nogi, Bass Clarinet

Hope for the Horn: The Case for the Recognition of Somaliland

Alex Kazer, Roosevelt @ UGA

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

Since 1991, Somalia has been plagued by famine, civil war, and a complete lack of

governance. However, in Somaliland, the autonomous northern region of Somalia, there is peace. Not only has Somaliland avoided the brutal history of tribal warfare that has characterized Somalia, but it has been democratically governed as an independent state since 1991, complete with tribal cooperation and peaceful transfers of power. While Somaliland declared its independence in 1991, it has yet to be recognized by any other state, precluding it from receiving foreign aid and investment and from forging security partnerships with other states. The United States should lead the international community in recognizing Somaliland as an independent state. This paper will demonstrate that recognizing Somaliland will not only yield tangible security improvements and economic benefits to the United States, but it will legitimize Somaliland's style of democracy as a model for the rest of East Africa. The international community continues to place its faith in the Transitional Federal Government, the current Somali administration, in the hopes of maintaining one Somali state, but the TFG has not even been capable of governing Mogadishu. An examination of Somali history will reveal the stark divisions between both states and the impossibility of reconciliation. Several African case studies indicate that Somaliland will not, as many African leaders fear, lead to the Balkanization of Africa and that a strong legal precedence for the division of the Somali state exists.

The Role of Plasminogen Activator Inhibitor-1 (PAI-1) in the Immunopathogenesis of *Plasmodium falciparum*-mediated Placental Malaria

Lauren F. Kelly

Dr. Julie Moore, Department of Infectious Diseases, University of Georgia

Placental malaria (PM) is characterized by accumulation of *Plasmodium falciparum*-infected red blood cells in the human placenta. This leads to maternal anemia and poor fetal outcome including low birth weight and possibly perinatal death. Primigravidae are more

susceptible to the devastating consequences of PM, suggesting the presence of gravity-dependent immunological resistance among malaria-exposed women. PM has been associated with damaging local maternal immune responses, including monocyte infiltration to the maternal placental blood space. An additional common feature of PM is excessive fibrin deposition, an end-product of blood coagulation. The immune factors that are involved in the recruitment and activation of maternal immune cells to the placenta and how this may relate to local hyper-coagulation are poorly understood. It is hypothesized that syntiotrophoblasts, fetal cells facing the maternal blood circulation, secrete these cell mediators as well as pro-coagulants or anti-fibrinolytics, resulting in the influx of maternal immune cells and clotting/fibrin accumulation. To address this hypothesis, placental plasma samples were collected in malaria-endemic western Kenya from parturient women and were stratified according to PM status and gravidity, with other parameters considered, such as the histopathological state of the placenta. The results reveal higher levels of soluble immune factor expression in PM+ primigravidae compared to multigravidae. The levels of plasminogen activator inhibitor (PAI)-1, which is responsible for fibrinolytic inhibition and thus may contribute to the excessive placental fibrin accumulation in PM, are currently under investigation. Furthermore, the relationship of PAI-1 to levels of local soluble immune factors is also of interest.

Eres un Universo de Universos: Reconnecting With the Human Aspects of Medicine Through Field Experiences on La Isla de Ometepe

Lauren F. Kelly
 Dr. Pamela B. Kleiber, Honors Program,
 University of Georgia

As an undergraduate premed student preparing for a career in global infectious diseases prevention and management, I lived with and helped administer medical services to Nicaraguan residents on *La Isla de Ometepe* for

two weeks in summer 2007. Reconnecting with the most essential and human aspects of medicine, I worked intimately with a Nicaraguan clinical physician as we visited four remote villages. I used qualitative research methods, specifically, heuristics (Moustakas), to interpret my experiences with the *Ometepe* people. Heuristics, a holistic process rooted in identifying with one's surroundings and creating an environment of continual questioning and self-dialogue, deepens self-awareness and illuminates one's connection with the world. My bilingual and visual journal documents my experience on the island, questions my prior assumptions, and details questions I developed in the field. During the four months after I returned, I iteratively reread and analyzed my journal and crafted *Eres un Universo de Universos*, a compilation of developed ideas and specific awakenings that transpired from the resonating themes of my documentation in Nicaragua. The process allowed me to identify particular moments marking personal transformations: the ferry boat ride when I left the world I knew; my severe illness when the people whom I intended to care for took care of me; and the post-trip reflection when I realized the unrivaled values of the experience. In my findings, I describe through my newly developed heuristics lens the persons, places and events as I experienced them during this intensive field experience on *La Isla de Ometepe*.

Usage of Linear Subspaces with Varieties

Tyler L. Kelly
 Dr. Elham Izadi, Department of Mathematics,
 University of Georgia

Algebraic geometry can be defined as the study of solutions of systems of polynomials in an affine or projective space. This discipline has many applications in fields such as Physics, Robotics, and Coding theory. The n -dimensional complex projective space, \mathbb{P}^n , can be defined as the set of lines in \mathbb{C}^{n+1} , or $n+1$ -dimensional complex space. A hypersurface X in \mathbb{P}^n is an irreducible homogeneous polynomial f of degree d , i.e. a polynomial of $n+1$ projective coordinates where each monomial of f has

degree d . Our goal is to classify these hypersurfaces and describe what they look like and what properties they have. To do this, we define the Fano variety associated to X , $F_k(X)$, as the set of k -dimensional linear spaces contained in X . For example, if $k = 1$, we will be looking at projective lines in X . This Fano variety is a subspace of the Grassmannian $\mathbb{G}(k, n)$, the set of k -dimensional planes in \mathbb{P}^n . Through a geometric argument, we can cover the Grassmannian with open sets of itself that are equivalent to the complex space $\mathbb{C}^{(k+1)(n-k)}$. This means that the Grassmannian is smooth; hence its tangent bundle of the Grassmannian as well as the Fano variety is well-defined. Analogously, this implies that it also has a well-defined normal bundle and many other properties mathematically make sense in the context of the Fano variety. This lets us classify the original hypersurface X according to these properties. We will investigate these properties and focus on the case of lines in cubics and quartics (degrees three and four, respectively).

Evaluation of Potential Inhalation Hazards of Petroleum-, Synthetic- and Bio-Fuels Using GC/MS Analysis of Vapors under Equilibrium Conditions

Christine M. Kendrick
 Dr. Jeffrey Fisher, Department of Environmental & Health Sciences, University of Georgia

The increasing attention and evolving policies concerning future energy supplies necessitates understanding the composition of alternative fuels. Fuels are complex chemical mixtures and with the possibility of switching to unconventional fuels the effects vapors may have on humans need to be known. A comparison of headspace vapor components, the vapor trapped above the liquid fuel in a sealed vial, of five fuel types was carried out using gas chromatography and mass spectrometry. Samples of Jet Propulsion Fuel (JP-8), a Fischer-Tropsch (FT) Synthetic Fuel (S-8), a 50/50 mixture of JP-8 and S-8, a commercial biodiesel, and a conventional diesel fuel were compared. Synthetic or FT fuel is produced in a catalytic reaction in which hydrocarbons are synthesized

from hydrogen and carbon monoxide. This process allows petroleum products, synthetic oil and fuel, to be produced from carbon sources other than oil. A preliminary inhalation study of aerosolized JP-8 and S-8 revealed important differences in the hydrocarbon composition of the droplets and vapor phases in the chamber atmospheres. Aromatic hydrocarbons found in JP-8 were replaced with methyl branched isoparaffins and lighter hydrocarbons (C8 - C10) in FT fuel. Headspace vapor results showed a bio-fuel blend of biodiesel and a bio-oil derived from wood chips contained toluene and benzene and some components specific to wood such as Alpha pinene, 2-beta pinene, Limonene, beta-Terpinene, Camphene, 2-methyl furan, and 2,5-dimethyl furan. Such components derived from oils and polymers of plant species may lead to unique exposures compared to petroleum based diesel fuels. These differences in composition mean humans would be exposed to different molecules from each fuel resulting in distinctive health effects. Understanding the composition of each fuel leads to understanding the subsequent exposures which allows appropriate treatment of human health effects and helps create safe occupational exposure levels. Headspace samples of the five fuel types are currently under analysis using Total Ion Content to make a final comparison. Research focusing on JP-8 and diesel exists, providing extensive data from animals and modeling about their exposures. Comparing the composition of various fuel types in the context of inhalation exposures is a new endeavor however. There is data beginning to be collected on emissions of biodiesel and alternative fuels, but there is minimal data on direct vapor exposure which is what workers and producers would be in contact with. Initial results indicate more research is needed to describe the significant molecules in each fuel, the pathways and metabolism of such molecules in the human body, and ultimately the health effects. To gather that data for the various fuel types, these fuels should undergo standardized toxicological evaluations.

Finding the Best Protocol to Homogenize Carbon Nanotubes

Karen S. Kenner

Dr. Marcus Lay, Department of Chemistry,
University of Georgia

Carbon nanotubes (CNTs) have many unique physical and chemical characteristics that have made them the focus of intense research in various areas of materials research. These nano-scaled molecular wires are the strongest known material. Furthermore, they also exhibit enhanced electronic properties, enabling new technologies that require lightweight and transparent electronic materials. CNTs are revolutionizing technology in the scientific community, from making stronger combat material for uniforms, to a potential space elevator that would go into outer space.

Therefore, the past decade has seen an exponential increase in publications related to CNTs. Although CNTs exhibit many important qualities that make them versatile enough to serve in many different capacities, they have some significant problems that must be overcome before they are ready for widespread use. One major problem with CNT material is that when it is formed, large bundles of CNTs are formed (similar to a bundle of straws stuck together). These bundles must be separated in order for the CNTs to exhibit their desired semiconductive behavior. Sodium dodecyl sulfate (SDS) is a surfactant (soap) that can be used to suspend individual CNTs in aqueous solution, with the aid of sonication. The purpose of this study was to develop a protocol for homogenizing CNTs in 1.0 % sodium dodecyl sulfate (SDS) and investigate the length of individual CNTs while using various sonication powers (watts). Various solutions were mixed, using a sonicator, in increments of 4 watts ranging from 4-24 watts. UV-vis spectroscopy was then used to verify the effectiveness of dispersion. Next, the solution was centrifuged for 30 minutes at 1800 rpm, to remove any remaining bundles. The UV-vis data was collected again and the solution, containing CNTs, was deposited on silane-coated glass. An image was obtained from the deposits on the

glass with the use of Atomic Force Microscopy (AFM). The images were used to determine that the best sonication power to homogenize CNTs would be 6 watts. Excessive Sonication was found to damage the CNTs, while insufficient sonication resulted in bundles remaining.

Knowing the best sonication power is important to the overall science community because it will ensure that networks are being made to function at the maximum capacity. By sonicating too long or too little the length will vary.

Mutagenesis Analysis of the Chain Length Determination Domain of the *Toxoplasma gondii* Farnesyl Diphosphate Synthase

Noah A. Koon

Dr. Silvia Moreno, Department of Cellular
Biology, University of Georgia

Toxoplasma gondii is a protozoan parasite and a major opportunistic pathogen of immunocompromised patients and of fetuses from recently infected mothers. Drugs used for chemotherapy of toxoplasmosis are not ideal because of their side effects. Farnesyl diphosphate synthase (FPPS) is a key enzyme in the synthesis of isoprenoids and appears to be a potential drug target for chemotherapy. *T. gondii* FPPS (TgFPPS) is inhibited by bisphosphonates, which are pyrophosphate analogs used clinically for the treatment of bone disorders. These compounds also show inhibition of *T. gondii* growth *in vitro* and *in vivo*. Recent work has shown that TgFPPS is a bifunctional enzyme as it can synthesize both the 15-carbon isoprenoid farnesyl diphosphate (FPP), and the 20-carbon isoprenoid geranylgeranyl diphosphate (GGPP). This is different from other FPPSs, which can only synthesize FPP. Because of this functional difference, bisphosphonates with a long side chain are more active against this enzyme than against other FPPSs. The Moreno-Docampo lab has investigated the mechanism by which TgFPPS is able to act as a bifunctional enzyme by using site-directed mutagenesis of the amino acid residues present in the chain-length determination domain of the enzyme. Ten mutant enzymes were produced, expressed and purified. The kinetic characteristics of these

mutants were analyzed revealing that the fourth amino acid upstream to the first aspartic acid-rich domain (FARM) region is essential for activity. Other mutations changed the products formed. These results will help to develop more efficient anti-toxoplasmosis drugs in the future.

Unbiased Isolation of Alpha-Dystroglycan

Andrew F. Kragor, CURO Summer Fellow,
CURO Scholar

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

The majority of proteins on the surface of cells are decorated with carbohydrate sidechains, which have been repeatedly demonstrated to effect protein structure, stability, and activity. A specific class of sugar modifications, the O-linked sugars, have been demonstrated to play a significant role in diabetes, muscular dystrophy, leprosy, and most recently, cancer. α -dystroglycan (α -DG) is critical for many interactions of the cell with its environment. As such, it is an outstanding candidate for affecting cellular movement and adhesion, which are central in the development and spread of cancer. The isolation of α -dystroglycan from mouse muscle tissue was accomplished by a non-biased method, using conventional column chromatography that does not differentiate based on glycan structures. The protocol for mouse muscle α -DG was also applied to mouse brain α -DG isolation. α -DG has been previously isolated at the University of Minnesota, but by methods which were specific to certain glycosylations. The method we formulated is proposed to work generally for all species and organ types within those species, regardless of their glycosylation. The protocol is currently being streamlined to create better yields. Another option started is to create an antibody that selects for the peptide backbone of α -DG, again regardless of its glycosylation, and therefore independent of its functionality and tissue source. This is required prior to mapping and structural determination of all the carbohydrate structures on α -dystroglycan. It also sets up a protocol for isolation of α -dystroglycan from mice that have altered forms

of O-mannosylation, which seems to be the key carbohydrate chain for functionality, and therefore disease state.

Functional Analysis of the *Magnaporthe grisea* Secretome

Brian T. Laughlin, CURO Summer Fellow,
CURO Scholar

Dr. Sheng-Cheng Wu, Complex Carbohydrate
Research Center, 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) that have been proteomically identified. Among these, MgEcp22 and MgEcp23 are exclusively secreted during infection of the plant host, thus may be pathogenicity factors or signal-molecules involved in interactions between the fungus and its plant host. To better understand their roles, the *MgEcp22* and *MgEcp23* genes were cloned into *M. grisea* expression vectors under strong and constitutive promoters. Three completed expression constructs, each carrying the *MgEcp22* or *MgEcp23* gene, were successfully transformed into *M. grisea*. The (His)₆- and Myc-tagged MgEcp22H and MgEcp23H presumably secreted into the culture media were examined by Western-blotting, but the results were inconclusive. Additionally, infection analysis of several MgEcp22H- and MgEcp23H-transformed *M. grisea* strains on rice seedlings showed a consistent and significant reduction in total number of infection lesions comparing to those caused by wild-type *M. grisea*. It is possible that constitutive over-secretion of MgEcp22H or MgEcp23H resulted in a stronger immune response by the plant host. Future work will involve quantitative infection assays and microscopic examination of detached rice leaves. The probable formation of protein complexes between MgEcp22H/MgEcp23H, and plant host protein(s) during infection will also be investigated. Such complexes may then be characterized using current proteomics technology. Ultimately, my work aims to reveal

the function of such ECPs so that novel fungicides may be engineered.

The Impact of Low Income Families on the Development of Literacy

Lauren M. Lesso, Susan Hulteen, Christopher Newberry, Kim Mears, Christina Borne, Alex Carson

Dr. Tsu-Ming Chiang, Department of Psychology, Georgia College & State University

The development of emergent literacy is essential to the learning foundation of reading. Emergent literacy is reading and writing skills acquired during the preschool years that serve as a gateway to comprehensive reading in continuing grades. Research has shown that lack of emergent literacy skills places children at a higher risk of developing reading disabilities. Social and cultural contexts are highly influential on the attainment of emergent literacy. Teachers and parents are the ones who provide the ideal reading environment in school setting and at home. The present study, part of a larger study examining children's social development, focused on documenting children's preference in various objects through toy selection. Two hundred and eighty-four children, with ages ranging from 3 to 4, were collected in 3 waves of data from the local head start program during the past 4 years. Children were asked to report their favorite object verbally, followed by pointing at a favorite object from a box containing a book and various toys. The results showed that very few children (girls, 5.1%, 16.7%, 0% and boys 8.3%, 3.2% and 0% respectively) selected books as their favorite object at both ages 3 and 4. The significantly low percentage of children interested in books may indicate a drastic need for reading programs to be implemented as early as preschool to aid in the development of emergent literacy. The implications of how to foster needed literacy programs at the head start programs and gender effects will be discussed at the conference.

Tort Cases in Georgia in the Early 2000s: Tort Abuse Not as Prominent as Portrayed

Rebecca I. Lunceford

Prof. David Mustard, Department of Economics, University of Georgia

A tort is the unlawful violation of a private legal right other than a mere breach of contract. Many have feared recently that tort reform is a necessary action to repair the current system of unreasonably high and frequent punitive damages awarded to greedy plaintiffs. These high damages create incentive for more filings of tort cases and possible abuse of the legal system. Research from data collected through the University of Georgia Law School shows that this is not necessarily the case. The data contain tort information from all the cases filed from the years 2004 to 2006 in both Superior and State courts for several counties in Georgia including Bibb, Cobb, Fulton, and Gwinnett. The data collected consists of many elements from the case files including length of time it took to dispose of the case, the type of tort filed, the type of damages requested (punitive or compensatory), how the case was disposed of, and if the case did go to trial, what type of damages, if any, were awarded. The data show that at least in Georgia, the popular belief of unjustifiably high damage awards and a strong upsurge in cases filed is not the reality. The large majority of tort cases filed are simple automobile collisions. The percentage of tort cases that actually go to trial are extremely low, and out of the small amount of cases that do go to trial, a small portion of those are awarded punitive damages. Georgia's current tort system appears to operate well with little need for powerful and immediate reform.

Inhibition of the CaaX Proteases Rce1p and Ste24p with Peptidyl (Acyloxy)Methyl Ketones (AOMK) and Quinolinol Based Molecules

James P. MacNamara, CURO Summer Fellow
Dr. Timothy Dore, Department of Chemistry,
University of Georgia

Ras is a GTPase involved in growth pathways and a common proto-oncogene with a CaaX motif, where “C” is cysteine, “a” is an aliphatic amino acid and “X” can be a variety of amino acids. Rce1p participates in a three-step activation of Ras by cleaving the -aaX amino acids from the C-terminus. By inhibiting Rce1p, mutated Ras activation could be halted in cancer cells, preventing any further growth. Two series of molecules are being synthesized with the intention of inhibiting Rce1p and a yeast equivalent Ste24p: peptidyl (acyloxy)methyl ketones (AOMKs) with analogs of five dipeptide backbones and quinolinol based analogs. By synthesizing and assaying these compounds against Rce1p and Ste24p, the inhibitory profile of the molecules can be gained and more information about the active site of Rce1p can be established. Ste24p is a zinc-metalloprotease with a known active site, and therefore molecules with similar inhibitory abilities for both enzymes may reveal Rce1p proteolysis mechanism. By varying the second amino acid and the benzoate, these analogs could inhibit RCE1p and ste24p more effectively. Of the AOMKs, Z-Phe-Arg was the most potent backbone, with the most potent molecule inhibiting 69% activity of Rce1p and 97% of Ste24p. Because the leaving group ability does not correlate with inhibitory abilities, it is more likely that the AOMKs work through non-covalent inhibition. The quinolinol based compound strongly inhibited both Rce1p and Ste24p and analogs are currently being synthesized and tested to improve its inhibitory ability and determine its mechanism.

The Joys of Hunting: Analyzing the Relationship Between the Small Hunt Mosaic of Piazza Armerina in the Architectural Space of the Hiemale Triclinium

Lillie Ann M. Madali
Dr. Asen Kirin, Department of Art History,
University of Georgia

The Villa Filosofiana at Piazza Armerina is an early 4th Century Roman estate on the island of Sicily which houses a Small Hunt floor pavement in the hiemale triclinium or winter dining room. This floor pavement highlights the most important moments of a hunting excursion, among them a scene of sacrifice to Diana the goddess of hunting, a banquet scene, a stag hunt and a boar hunt. A reconstruction of the relationship between the Small Hunt floor pavement and the hiemale triclinium promotes a new art historical understanding. A comparative analysis of the iconography associated with hunting in other art works like the Sevso Treasury and the Dunbabin Oaks Hunt floor pavement redefines its ritual significance and its relationship with the architectural space of the hiemale triclinium. The Small Hunt floor pavement exhibits the evolution of the visual culture associated with the civic ritual of dining. What is significant is the progression and transformation of triclinium iconography from the Second Century to the Fourth Century as it becomes more abstracted. Here we see the creation of the notion of the triclinium arrangement since it has become integrated so deeply within the visual culture related to dining. By highlighting similarities with past mosaics and relating it to the philosophical ideals contemporary to the Villa, there surfaces an understanding of the triclinium arrangement's significance as it promotes the structure's purpose as a true Villa Filosofiana conducive to the intellectual pursuits of the wealthy.

Female Choice and Male Mating Success in *Drosophila* Sexual Selection

Margaret C. Madean & Sohyun Kwon
Dr. Wyatt Anderson, Department of Genetics,
University of Georgia

Sexual selection is widely observed in nature. Females choose their mates based on courtship displays and sensory signals. In *Drosophila melanogaster* sensory information is exchanged during courtship. We hypothesized that (1) there is variation in male mating success; (2) males with a higher mating frequency will mate more quickly; and (3) pheromone levels will be greater in males with high mating frequencies. The following experiments were conducted to test these hypotheses. Female choice was observed by placing fourteen *Drosophila melanogaster* virgin males in a glass chamber, adding single virgin females, and then recording female mate choice. Males who mated the most and males who did not mate were collected for further analysis. Each male was placed with a virgin female in a vial. The mating speed of these couples was measured, and the males were individually analyzed for pheromone levels. The data showed high female selectivity, with females mating with certain males multiple times, while choosing not to mate with some males at all; this constitutes non-random mating. Mating frequency and mating speed show a negative correlation, so that males with a short mating speed mated more frequently. We are currently comparing pheromone levels in males with low and high mating frequencies, and we are also comparing *Drosophila melanogaster* with *Drosophila pseudoobscura*. This data will help us to understand the interplay between female mate choice, male mating speed, and pheromone levels—and to reach a fuller understanding of sexual selection in *Drosophila*, which is a key element of evolution.

Eliminating the Road Test in License Renewal Programs

Halina Maladtsova, Roosevelt @ UGA
Dr. Christopher Cornwell, Department of
Economics, University of Georgia

While elderly drivers and teenagers are the two demographics most susceptible to automobile crashes, state and federal driving laws have focused primarily on curbing the dangers of teenage driving. Economists expect the number of drivers ages 75 and older to triple to 33 million by 2050, an increase deserving the attention of lawmakers. Efficient license renewal programs will prevent poor drivers from harming themselves and others on the road. Some states have passed laws that affect license renewal procedures and aim to prevent senior citizens from driving if they are no longer physically or mentally capable. A careful analysis of data provided by the Fatality Analysis Reporting System reveals that the road test requirement implemented in Illinois and New Hampshire is an ineffective deterrent to elderly crashes and fatalities. Analyses of the effects of implementing a road test in Illinois and repealing it in Indiana confirm the ineffectiveness of the test as part of the two states' license renewal programs. In order to make sure that no other state implements the ineffective road test and wastes valuable resources, this policy proposes making Department of Transportation funding contingent upon states not implementing the road test as part of their license renewal programs. The paper also calls for increased funding to states that implement vision tests and in-person renewal requirements, both of which have been shown to identify poor drivers. Such laws may be criticized as discriminatory, but their purpose is not to prevent the elderly from driving, but to promote safety.

Dialect Perceptions of Spanish Speakers in Georgia

Sharon A. McCoy, CURO Apprentice
Dr. Chad Howe, Department of Romance
Languages, University of Georgia

Since the 2000 census, the Spanish speaking population in Georgia has increased by over 300 percent, creating a unique bilingual environment within the state. In order to investigate this language setting, I am collecting data regarding social factors such as age, amount of time spent in the United States, country of origin, and social networks, that affect the use and perceptions of Spanish held by native Spanish speakers within Georgia. A questionnaire will first be distributed to the Hispanic populations in the cities of Athens and Roswell, Georgia. It asks respondents to rate their views of Spanish by evaluating the Spanish spoken by their elders, peers, and by themselves on scales of “correctness” and “pleasantness.” In addition, respondents provide information regarding the use of Spanish in comparison to the use of English by Hispanics and by themselves in specific social situations, such as the home, church, work, or school. The results of the questionnaire will later be statistically analyzed to observe the effects of these social and demographic factors on the perceptions of the Spanish language and the development of Georgia’s bilingual climate. I hypothesize that, of these factors, the most influential are the age and community networks of respondents, followed closely by their duration of stay in the U.S. In the future, I wish to continue this investigation among other cities and regions of Georgia to analyze how these perceptions and social variables are affecting not only the speakers, but also the preservation of the languages themselves.

Polyphenolic Antioxidants in Unprocessed Traditional Diets: Wild-Crafted Acorn Flour as a Dietary Staple

Amy M. McGoff & Harold Jackson
Dr. James Hargrove, Department of Food &
Nutrition, University of Georgia

Polyphenolic phytochemicals are antioxidants that confer health benefits including reduced risk for cardiovascular disease, metabolic syndrome and certain cancers. The hypothesis was tested that acorn flour, a staple in many unrefined, traditional diets, contains higher polyphenolic levels than most modern foods. Acorns from 15 oak species found in the UGA Campus Arboretum were surveyed for polyphenolic and tannin content to estimate the unknown upper range of human polyphenolic consumption. Acorns from the black oak (*Quercus velutina*) and white oak (*Quercus alba*) were selected for further study. Initial total phenolic content and antioxidant capacity of the white and black oak acorns were measured. Due to high tannin content, acorns are normally leached with water and dried prior to consumption to remove the protein precipitating capacity. Thus, a radial diffusion assay was applied to quantify loss of tannins during leaching. Dried flour made from black and white oak acorns contained 40 mg/g and 15 mg/g of polyphenolic compounds, respectively, a substantial amount compared to a 1-12 mg/g range for whole wheat flour, berries and several nuts. Pomo Indians of California obtain 25-50% of their calories from acorns, thus approximately 200-400 g acorns/d. If the acorns consumed by the Pomo people contain similar amounts of polyphenols as the studied samples, diets in some traditional cultures provide more than 3,000 – 16,000 mg phenolics/d, demonstrating the upper range for human consumption of polyphenols. In comparison, the average present US dietary intake of polyphenolic antioxidants is less than 1/6 the amount consumed by some traditional cultures.

The Case for Minor Access to Emergency Contraceptive

Catherine P. Mencher, Roosevelt @ UGA
Dr. Monica Gaughan, Department of Health Policy & Management, University of Georgia

In 2006, 82% of all teen pregnancies were unplanned, and among all age groups, teens have the largest proportion of pregnancies ending in abortion. Despite such indicting statistics, the FDA still requires minors to have a prescription for Emergency Contraceptive (EC), the only contraceptive effective after unprotected sex. In 2003 the FDA banned minor over-the-counter (OTC) access to EC, and last year teenage birth rates rose for the first time in fifteen years. A section of the FDA ban; however, reserves the right of states to allow minor access to EC. This paper will evaluate the accuracy of FDA reasoning behind limiting minor access and propose the creation of a Georgia law allowing minors OTC access to EC along with a concurrent ad campaign to address the major issues surrounding this law. A case study will be preformed to evaluate minor's access to EC in Athens-Clarke County and generalize the found results to the entire state of Georgia. The policy calls for expanding funding to the Georgia Health and Human Services subcommittee to fund an EC task force. The task force will conduct a comprehensive study establishing both the availability and knowledge of EC to teenagers. Following the study, vigorous public campaigns throughout Georgia will explain to teens how to use and access EC and highlight the general public's misconceptions about EC—specifically that EC causes an abortion and would increase teen sex.

Effects of Social Environment on Women's Participation in Computer Science

David T. Mitchell, CURO Apprentice
Dr. Victoria Plaut, Department of Psychology, University of Georgia

For decades women have fought to become more active members in many areas of employment and higher education. Whereas women have achieved successful integration in

fields of study including law and medicine, there still exists a noticeable gender gap in other fields, such as computer science. According to the National Science Foundation, in 2004 women only earned 25% of all computer science BAs, a number that has been consistently decreasing. How do we explain why females at every level of our schooling are less attracted to computer science than their male peers? The goal of our research was to gauge the effects the *environment* plays on women's perception of computer science by exposing them to certain "masculine" characteristics of computer science (e.g. geeky objects such as Star Trek posters, soda, comic books) in a work environment vs. more neutral characteristics (e.g. non-geeky objects such as art posters, water bottles, general interest magazines). Following exposure, men and women were asked multiple-choice and open-ended questions about their interest in computer science and feelings of social fit. The results illustrated, for example, that jobs with more "masculine" characteristics were more frequently associated with computer science and more preferred by men than women. Results also suggest these effects are due largely to women's lack of perceived fit with masculine environments. Importantly, the research conveys the implicit effects of the environment on decision-making, although further studies (some in process) will be needed to better decipher the influence of varying deterrents on women concerning the field of computer science.

Is A Hepatitis E-Like Virus Found In Cats and Does It Cause Hepatitis?

Jessica L. Mobley
Dr. Elizabeth Howerth, Department of Pathology, University of Georgia

Hepatitis E virus (HEV) is an enterically transmitted non-enveloped, positive single stranded RNA virus in the new virus family Hepeviridae. The virus has only been identified in humans, chickens, and pigs. It is endemic in humans in developing countries with sporadic disease occurring in developed countries. Hepatitis seen in endemic cases in humans is similar histologically to an entity of unknown

cause in cats known as chronic lymphocytic cholangitis. Clinical signs in cats with this condition are very similar to those seen in HEV positive humans and swine. The objective of this study is to screen cats for the presence of a HEV and correlate viral presence to histopathologic evidence of cholangiohepatitis. We hypothesize that cats have a HEV that causes cholangiohepatitis. Bile and intestinal contents from cats submitted for necropsy at the College of Veterinary Medicine are being screened for HEV using a nested PCR technique that uses degenerate primers designed to amplify HEV from humans, pigs, and chickens. Any positive results will be correlated with liver histopathology in the same cat to assess the potential of the virus causing hepatitis. To date, there have been no PCR positive samples. Expansion of this project to include serologic detection of infected cats may be beneficial, as serology has been found to be more sensitive in detecting HEV infected humans due to transient viral shedding.

Oxygen Delivery After Ischemia in Active and Inactive Subjects

Michael D. Mogill

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

Recovery of oxygen saturation after ischemia has been used as an index of oxygen delivery in patient populations. The purpose of this study was to test whether active healthy subjects have faster rates of oxygen delivery compared to inactive healthy subjects. Active subjects (21.8 ± 1.9 yrs, mean \pm SD, $n=8$), who participate in aerobic exercise three or more times a week, were compared with inactive subjects (20.8 ± 2.4 yrs, $n=5$), who participated in aerobic exercise one day a week or less. Oxygen-heme saturation was measured in the medial gastrocnemius using the continuous light dual-wavelength near infrared spectroscopy (NIRS) device. Ischemia was produced by rapidly inflating a cuff (1-2s) to suprasystolic pressures (>220 mmHg) for four minutes. Subjects were allowed to recover for three minutes following cuff deflation. The time to $\frac{1}{2}$ recovery of oxygen

saturation was measured, assuming an exponential recovery. Active subjects had a shorter recovery time (9.8 ± 1.8 s) following ischemia compared to inactive subjects (13.6 ± 4.9 s). The difference between groups was statistically significant with $P=0.045$. The data supported the hypothesis that recovery of oxygen saturation was $\sim 40\%$ faster in active versus inactive young healthy subjects, consistent with known metabolic and vascular adaptations to endurance training. This suggests that the NIRS ischemic recovery test is capable of detecting training induced changes in a healthy population.

Expression of Glycerophospholipids in Rat Brain after Cocaine Withdrawal

Prashant Monian, CURO Summer Fellow
Dr. Brian Cummings, Department of
Pharmaceutical & Biomedical Sciences,
University of Georgia

The purpose of this study was to investigate the effects of cocaine withdrawal on glycerophospholipids in the hippocampus, frontal lobe and cerebellum of rat brains. Rats were injected intraperitoneal once daily with saline or cocaine (15mg/kg) over 4 days in a conditioned place preference (CPP) protocol prior to a withdrawal period of either confinement (abstinent) or injection of saline (extinguished). After 4 days of abstinence or extinction, a reinstatement CPP test was given in which a 5th cocaine injection was delivered. Tissues were collected 1 week following this final cocaine exposure, lipids isolated using Bligh-Dyer extraction and analyzed by electrospray ionization-mass spectrometry. Phospholipid profiles of the hippocampus and frontal lobe were similar in control rats, while the cerebellum expressed lower levels of 32:0 phosphatidylcholine (PtdCho) and 36:4 PtdCho. However, the cerebellum expressed lower amounts of 34:2, 36:3 and 36:1 PtdCho. The expression of sphingomyelins (a specialized lipid abundant in brains), were higher in the cerebellum than the hippocampus or frontal lobe, especially 24:1 and 26:4 sphingomyelin. Cocaine withdrawal using either the abstinent or

extinguished protocols did not alter sphingomyelin expression. The abstinent protocol resulted in lower levels of 14:0-16:1 and 18:0-20:4 Ptdcho in the hippocampus. In contrast, no changes in phospholipid expression were detected in either the frontal lobe or the cerebellum. Decreased expression of phospholipids in the hippocampus correlated to increased levels of 16:0- lysophospholipids. These data support the hypothesis that the expression of phospholipids in the hippocampus is altered during cocaine withdrawal in a rat model of addiction.

Potential Economic Impact from Zeolite Use in Uganda

Mia Catherine Morgan

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

In a previous study at the University of Georgia, the mineral zeolite was successfully identified through samples collected within geologically favorable areas of Uganda. This discovery is significant because it is the same mineral currently being used in the development of a dairy cooling system for smallholder Ugandan dairy farmers. The mineral was located in the areas surrounding the Manapha River and Mount Elgon and was identified as the type of zeolite, analcime. The cooler technology utilizes this type of zeolite for its unique adsorption capacity, and the analcime located in Uganda showed absorption potential greater than the leading commercial source available. Remarkably, this mineral is also used in several other industries, including many specifically advantageous to developing country economies such as water filtration, animal feed supplements, and fertilizers. The goal of this research project is to determine the exact economic and industrial growth potential through the use of zeolite in Uganda. Eight weeks during the summer of 2007 were spent in Uganda interviewing and collecting data on the current economic standing of specific industries, such as animal feed, water, and dairy. This data examined along with information on current

uses of zeolite will be used to show that utilizing the zeolite source in Uganda is economically advantageous for the country.

Creation of a Transposon Library in *Francisella tularensis* Strain LVS

Diana Murro

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

Tularemia is a serious infectious disease of small animals and humans caused by *Francisella tularensis*. *F. tularensis* subspecies *tularensis* is the most virulent subspecies to humans. The Live Vaccine Strain (LVS) is derived from *F. tularensis* subspecies *holarctica*. LVS is avirulent in humans, but can still replicate in macrophages and cause disease in mice. Transposons, or mobile genetic elements, will be utilized to create a transposon mutant library in LVS. A transposon vector that contains genes that code for resistance to the antibiotic hygromycin and expression of green fluorescent protein (GFP) has already been created. This transposon vector will be used to produce a transposome which will be forced into the *F. tularensis* LVS by electroporation. Bacteria from colonies that grow on medium containing hygromycin will be collected. Those that express GFP are likely the result of transposition and will be stored to create a library of mutants. In future research, this mutant library will be screened for those that cannot survive in macrophages. The location of the genes disrupted by insertion of the transposon will be identified. The identity of the genes that impair survival of LVS in macrophages should help to understand the mechanisms by which *F. tularensis* escapes killing by the host and may aid in the creation of a more effective tularemia vaccine.

Investigating the Role of Corticotrophin Releasing Factor 1 Receptors (CRFR1) in Stress-Induced Weight Loss

Neil D. Naik, CURO Summer Fellow
Dr. Ruth Harris, Department of Food & Nutrition, University of Georgia

Most people who lose weight through diet and exercise regain the weight within five years. In contrast, mice exposed to repeated restraint stress (RRS: 2 h in restraint tube on each of 3 consecutive days) lose weight and do not return to the weight of non-stressed controls after restraint ends. Stress increases expression of corticotrophin releasing factor (CRF) which activates the hypothalamic-pituitary-adrenal axis, induces anxiety-type behavior, and inhibits feeding. Mice that did not express CRFR1 (knockout), normal littermates (wildtype), and adrenalectomized wildtype (ADX) mice were used to test the role of CRFR1 in mediating the long-term reduction in body weight of RRS mice. Half of the mice from each group were subjected to RRS. Body weight and food intakes of all of the mice were recorded before, during and for eight days after RRS. The mice were then subjected to two anxiety-type behavior tests: an elevated plus maze and a light-dark chamber. The CRFR1 knockout RRS mice, unlike the wildtype and ADX RRS mice, did not lose a significant amount of weight during stress and exhibited less anxiety-type behavior, compared to their controls. These results suggest that CRFR1 are important in mediating both anxiety-type behavior and a long-term reduction in body weight of stressed mice. It is possible that a continuously elevated state of anxiety contributes to the reduction in body weight. Identifying mechanisms that cause these changes in RRS mice may lead to development of strategies that allow people who lose weight to maintain the weight loss.

The Role of KIT-Ligand in Enrichment and Differentiation of Germ-Like Cells in Human Embryonic Stem Cell Cultures

Muktha S. Natrajan, CURO Apprentice
Dr. Steven Stice, Department of Animal & Dairy Science, University of Georgia

Primordial germ cells (PGCs) are important precursor cells that undergo differentiation to become sperm and can potentially be derived from human embryonic stem cells (hESCs). This offers a new tool to understand human germ cell differentiation, signaling pathways and may lead to fertility treatments. Kit-Ligand (KITL) is a signaling factor that is active during embryogenesis which affects germ cell differentiation, proliferation and inhibits apoptosis. KITL is known to encourage spermatogenesis and initiate meiosis. This signaling factor is found in a soluble or membrane-bound form, depending on the RNA splicing around exon 6. The objective of this study was to determine the effect of the presence and absence of the soluble and membrane-bound KITL forms on enrichment and differentiation of germ-like (POU5F1+ DDX4+) cells from hESCs. BGO1 (XY) hESCs were maintained on mitotically inactivated mouse embryonic feeder (MEF) layers in 20% KSR stem cell media, at 37°C and 5% CO₂. Cells were manually passaged to maintain pluripotency. Germ-like cells were differentiated on MEFs with soluble and membrane-bound KITL, soluble KITL only, membrane-bound KITL only, and without soluble and membrane-bound KITL for 0, 3 and 10 days without passaging. Cells were fixed and analyzed by immunocytochemistry or flow cytometry. RNA was collected and analyzed by qRT-PCR. We expect that differentiated hESC cultures grown in soluble or membrane-bound forms of KITL to show decreased enrichment and differentiation relative to cultures where KITL in both forms is present. Complete knockout of both forms is expected to result in complete loss of enrichment and differentiation.

The Roles of Non-Homologous End Joining Repair Proteins in Non-B-DNA Structure Induced Genetic Instability

Nithya M. Natrajan

Dr. Karen Vasquez, Department of Carcinogenesis, University of Texas

Dr. Mary Bedell, Department of Genetics, University of Georgia

DNA structure is a critical element of its function. B-DNA is the most common, right-handed helical form of DNA. The sequences that form some non-canonical (non-B) structures have been mapped to translocation breakpoints in Burkitt's lymphoma, implicating these structures in cancer etiology. In previous work, we have shown that certain types of non-B DNA structures are mutagenic in mammalian cells. For example, Z-DNA (left-handed DNA) formed in CG repeats has been shown to induce large-scale deletions and complex rearrangements, which result from DNA double strand breaks (DSBs) induced by this structure in mammalian cells. However, in bacteria, small-scale expansions and deletions are much more common within this repeat. The inconsistency in the mutation spectrum between bacterial and mammalian cells may be a result of how DSBs are repaired. Mammalian cells predominantly use non-homologous end joining (NHEJ) to repair DSBs and bacteria utilize homologous recombination (HR). While HR is an error free type of repair, NHEJ often causes mutations. In this study, we determined the Z-DNA induced mutation frequencies in HR proficient, HR deficient (RecA⁻), or HR deficient/NHEJ proficient (RecA⁻ or RecB⁻ and Ku⁺/LigD⁺) bacterial strains. The RecA⁻/NHEJ deficient strain and the RecB⁻/NHEJ proficient strain had a higher mutation frequency than the HR proficient strain. The RecB⁻/NHEJ proficient strain had ~20% large-scale deletions and 80% small-scale deletions and expansions. This suggests that, while the differences in DSB repair appear to affect the mutation spectrum and frequency, it is not the only reason for the disparities.

Genetic Studies on the Roles of KITL in Regulating Germ Cells in Mice

Natalie A. Nesmith, CURO Summer Fellow

Dr. Mary Bedell, Department of Genetics, University of Georgia

Kit ligand (KITL) and its receptor KIT are required for the development and proliferation of germ cells, melanocytes, and hematopoietic cells in humans, mice and many other vertebrates. Of particular interest in our lab is the role of KITL in the differentiation and development of germ cells. Using various tissues and staining methods, the roles of KITL in primordial germ cells (PGCs) and later germ cell forms were investigated in mice to elucidate more clearly their localization patterns and to determine more fully the roles of cytokines in germ cell development. We have optimized protocols by determining favorable antibodies, their combinations, and concentrations used in the staining of sectioned tissues. Of the antibodies that were markers for PGCs and were tested, eight were found to work properly. These included α -SSEA-1, α -E-cadherin, and five different α -KIT antibodies. These optimizations allowed the collection of results that confirmed published results about KITL expression in various tissues including the gonads, neural tube, skin and the wolffian duct. The results also revealed some novel aspects of KITL localization including KITL within PGCs and its presence during development of sertoli cells of the testis. In conjunction with this project of KITL localization was one that included the sectioning, staining, and compiling of information on the positioning of PGCs in the 43R mutant line. Based on previous studies of PGCs characterized in 43R mutants, there was a suggestion that these mutant embryos exhibit ectopic expression of PGCs. But from the collected results, ectopic PGCs expression was not as pronounced as originally hypothesized. More tests need to be done in order to gather more specimens and information concerning the misdirected cells.

The Effects of Alcohol Abuse on Antisaccade Performance

William T. Oliver

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

Previous research on alcohol and its effects on cognitive function have shown marked impairments in ability to inhibit behaviors. Habitual alcohol use is thought to impede executive control and overall cognitive efficiency as measured by simple perceptual tasks. Studies in persons engaged in habitual alcohol use have shown significant impairments in both reaction times and inhibition tasks. This suggests that there will be a positive correlation between alcohol use and antisaccade error rate, and in alcohol use and eye movement reaction times for correct antisaccade trials. Antisaccade tasks, which require rapid eye movements to the mirror image location of a peripheral stimulus, will allow for reaction time and behavioral inhibition to be measured simultaneously. In order to test this hypothesis, undergraduate participants were tested using a standard alcohol assessment interview (CDDR), recording such variables as frequency, duration, and amount of use. Following each interview participants completed antisaccade tasks in which error rates and response times for correct antisaccades were recorded on a trial by trial basis. Score distributions for both the substance abuse screening and antisaccade task performance were made, and the upper and lower portions of the distributions were compared. It is expected that the current study will yield positive correlations between alcohol abuse and poor antisaccade task performance. Significant correlations between the two could lead to a greater understanding of the cognitive impairments associated with alcohol use and provide valuable information for future studies concerned with localizing the regions of the brain impaired by habitual alcohol use.

From Page to Stage

Opera Ensemble

Prof. Frederick Burchinal, Director and Department of Voice, University of Georgia
Prof. Gary DiPasquasio, Pianist/Music Director and Department of Voice, University of Georgia

Performing opera successfully is a complex process. First, the singer must analyze the written music and attempt to understand the composer's intentions. Then the performer's own creative sense must transform the music on the page into a living, breathing, moving structure—recreating each time a new and vibrant performance for the audience to enjoy. For the CURO Symposium, the UGA Opera Ensemble will demonstrate this process by offering the “plain” version, as seen on the score's page, and then transforming it into the live “painting” or “sculpture” that moves the audience. To demonstrate the role of the artist in the development of a fine performance, we will then offer two different interpretations of the same music, underlining the need for each artist to be an active participant in the creative process. We hope that listeners will be inspired to discover the hidden messages that every composer offers in his or her musical “blueprint,” and that they will explore their own world of choices and imagination.

Jason Blanton, Bass-Baritone

Ben Dawkins, Baritone

Andrew Frazier, Baritone

John Ford, Tenor

Danielle Granati, Soprano

Kathryn Sabol, Soprano

Ronaldo Steiner, Baritone

Megan Tucker, Soprano/Dancer

Kristen Vanderoef, Mezzo-Soprano

Brett Vogel, Bass

Katherine Walters, Soprano

Chloe Zeitounian, Soprano/Dancer

The Homeric Lineage of Lautaro in Ercilla's *La Araucana*

Victor M. Orellana, CURO Summer Fellow,
CURO Scholar
Dr. Nicolás Lucero, Department of Romance
Languages, University of Georgia

Within the highly structured literary periods of the European Renaissance and the Spanish Golden Age, Alonso de Ercilla relied heavily on imitation of classical form to both legitimize and inspire the workings of his poem, *La Araucana*. As a part of the fiercely competitive body of work accompanying the colonial movement through the New World, this aspiring Renaissance epic was expected to adhere to very specific ideals for the church, the Spanish crown, and the highly biased audience across Europe that would be judging it. Therefore, to sell the idea of a serious threat against the Spanish conquistadors, Ercilla used individual heroes to raise the opposition to epic proportions that could feasibly hinder such a superior military force. Furthermore, he employed the virtuous Hector from Homer's *Iliad* in his character of the Mapuche war-chief Lautaro to elevate him to formidable stature, linking the two heroes through epithet, similar trials of love at war, and their ultimate downfalls through hubris. Read within this context, Ercilla's challenges to contemporary archetypes and the prejudices of his audience become increasingly more clarified, especially those regarding the image of the ineptitude and barbarism of the natives of the New World. Additionally, it helps establish a link between *La Araucana* and the secondary epic tradition started by Lucan's *Pharsalia*, offering further explanation both for commonplace criticisms of the poem's structure and for the arguable digression of the poem from its boldly-stated mission of Spanish glorification.

Reducing and Rethinking Recidivism

Terry L. Palmer, Roosevelt @ UGA
Dr. Mark Cooney, Department of Sociology,
University of Georgia

Since the landmark cases *Kent v. United States* (1966) and *In Re Gault* (1967), the juvenile justice system has taken a punitive stance towards sentencing that focuses on adjudicating juveniles with increased jail time. This focus however, neglects the reformation of the juvenile's epistemology. According to a 2006 Georgia Department of Juvenile Justice Report, the results of the current focus have allowed the juvenile recommitment rate to steadily increase over the last eight years to forty percent. If the current, conventional system of adjudication is continued, the US is likely to experience continued growth in both juvenile crime and recidivism. Through an extensive secondary analysis of the literature, this paper illustrates that restorative justice, specifically the victim-offender model, is more effective at preventing recidivism than the current punitive system. This paper proposes that Georgia should adopt sections four through eight of the Australian Crimes Act of 2004, a legislative bill that will standardize the juvenile justice system and involve the community and the victim as active participants in seeking unique adjudication for the crime committed. A restorative justice system will emphasize a unique sentence for each offender that will accurately influence his/her way of thinking so as to affect his/her future actions. Supported by the results of case studies in Australia, Arizona, and New Zealand, this legislation will significantly reduce the recidivism rate for juveniles in Georgia.

Development of a Biocontrol Agent for Chinese Privet, *Ligustrum sinense*

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

Ligustrum sinense, commonly known as Chinese Privet, is an exotic invasive shrub that invades millions of acres of land in the southeastern United States. Although Privet spreads rapidly

and limits the growth of more-important native species, there is no efficient mechanism to control it. Therefore, the purpose of this project is to develop a cost effective biocontrol agent for Privet. This goal may be achieved by creating 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 a toxic amino acid. Tests in which Privet plantlets were treated with eight different amino acids showed that methionine and lysine were both toxic to Privet. With this information, the next step is to create a mutant fungal pathogen that secretes large amounts of one of these inhibitory amino acids. To do this, strains of fungi have been isolated from 14 cuttings of the Privet plantlets used in this project. 10 of these strains have been identified as *Trichoderma* species by amplifying and sequencing the ITS region of their rDNA. One of these *Trichoderma* strains will now be randomly mutated in the presence of UV rays. A mutant colony that secretes high amounts of methionine or lysine or both will then be isolated using auxotrophs and tested as a potential pathogen. If successful, this project will provide an effective biocontrol agent for Privet and a model that could be used to control other exotic weeds.

Generating Uniform Proliferation of Neuroprogenitor Cells

Tulsi Patel, CURO Summer Fellow
Dr. Steven Stice, Department of Animal & Dairy Science, University of Georgia

Human embryonic stem cells are pluripotent cells that have the potential to differentiate into all cell types found in the human body. The Stice Lab has successfully derived neuroprogenitor cells, which can be further differentiated into neurons, from human embryonic stem cell lines. However, under current conditions, differentiated cell cultures are not completely pure. Therefore, the purpose of this study is to elucidate exactly what factors are important for the proliferation and uniform differentiation of neuroprogenitor cells into motor neurons. The media currently used for cell

proliferation comprises of neurobasal media supplemented with B27, Leukemia Inhibitory Factor, Fibroblast Growth Factor 2, and L-glutamine. All of these are defined components except B27, which is composed of a defined supplement, N2, that can be bought separately, and other anti-oxidants and factors. In order to maintain uniformity in cell culturing, the significance of the unknown anti-oxidants and factors must be determined. To this effect, experiments in which neuroprogenitor cells were grown in N2 supplemented neural basal media with various concentrations of B27 ranging from 0 to 1XB27 were performed. Preliminary results show that cells die in the absence of B27, indicating that the other components are essential for cell survival. However, a concentration of 0.5X B27 is sufficient for proliferation. More experiments will be performed with combinations of different factors to determine exactly what components of B27 are necessary. By completely defining the culture media, this study will refine and accelerate neural cell culturing, thereby making more cells available for further biomedical research.

The Application and Adaptability of N.A. Rimsky-Korsakov's Orchestration Techniques Across National Styles in Orchestral Program Music

Laura C. Patterson
Dr. David Haas, Department of Musicology & Ethnomusicology, University of Georgia

Nikolai Rimsky-Korsakov's music has come to represent Russian musical nationalism. His distinctly recognizable sound is achieved through a unique approach to orchestration that differed in many ways from the techniques used by many German and Western European composers of the time. These techniques were versatile enough to allow Rimsky-Korsakov to create not only a "Russian" style in his music, but also other national styles. Rimsky-Korsakov's role as a composer and hugely influential teacher led to the utilization of his orchestration methods in other composer's works. Even students who studied with Rimsky-

Korsakov for a very short period of time, such as Ottorino Respighi, were able to absorb his orchestration techniques and apply them to their own music. Because little scholarship exclusively explores Rimsky-Korsakov's orchestration style, this project seeks to show the relationship between Rimsky-Korsakov's *Principles of Orchestration*, his pedagogical orchestration text, and his own works. Specifically, analysis will focus on identifying Rimsky-Korsakov's unique approach to orchestration as outlined in *Principles of Orchestration* in three compositions of varying national styles. Because *Capriccio Espagnol*, *Scheherazade*, and *Russian Easter Overture* are impressionistic orchestral pieces and not operas, the orchestration is unimpeded by subservience to a specific dramatic plot or libretto. This project will also show that Rimsky-Korsakov's orchestration techniques are recognizable in Ottorino Respighi's *Feste Romane*, the last work in his "Roman Trilogy." In each piece, the distinct national musical traits will be identified followed by an analysis of how the versatility of Rimsky-Korsakov's orchestration methods helped to achieve each different national style.

Behavioral Effects of Navigate® on Paedomorphic Mole Salamanders, *Ambystoma talpoideum*

Amanda C. Perofsky
Dr. John Maerz, Department of Wildlife,
University of Georgia

Over \$10 million is spent annually in the U.S. to control invasive aquatic plants for game fish management and native species habitat management. One concern about application of herbicides for controlling aquatic plants is their effect on non-target species. 2,4-dichlorophenoxy acetic acid butoxyethylester, commercially available as Navigate®, is the most commonly used aquatic herbicide in the U.S. Few studies have investigated the effects of exposure to Navigate® in benthic species despite evidence that these organisms may experience toxic doses even when the herbicide is applied at recommended application rates. This study examined the effect of exposure to Navigate® on

activity levels and foraging in paedomorphic *Ambystoma talpoideum*, a benthic salamander species commonly found in the types of freshwater habitats to which Navigate® is applied. Eight salamanders were randomly placed in each of 16 outdoor mesocosms containing pond water and sediment. Navigate® was applied at the manufacturer's recommended dosage for resistant weeds to eight, stratified, randomly selected mesocosms. One salamander from each mesocosms was removed 1 day prior and 1, 14, and 42 days post-Navigate® application, placed in individual tanks, and allowed to acclimate for 24 hours prior to observation. Twenty minute behavioral observations were conducted for each salamander. At the beginning of each trial, one prey item was dropped in the tank and the number of movement events, total movement time, and successful foraging attempts were recorded. We will report statistics that compare the differences in activity levels and foraging in exposed versus unexposed *A. talpoideum*.

Characterizing RNA-Protein Complexes in *Pyrococcus furiosus*

Neil T. Pfister, CURO Scholar
Dr. Michael Terns, Department of Biochemistry & Molecular Biology, University of Georgia

Ribonucleoprotein (RNP) complexes are ubiquitous macromolecular machines involved in most major aspects of cellular function. Various protein and non-coding ribonucleic acid (ncRNA) components form distinct essential RNP complexes. The hyperthermophilic archaeon *Pyrococcus furiosus* is a model system that has provided important insight on human RNP complexes, including those implicated in diseases such as dyskeratosis congenita. We are interested in characterizing novel RNP complexes in *P. furiosus*, and through a general RNA cloning approach, have identified a new class of ncRNAs in this organism. These ncRNAs are implicated to function with a set of related proteins in viral defense in prokaryotes. In order to investigate these hypothetical RNP complexes, I have subcloned genes coding for the putative protein partners into plasmid vectors

and expressed the proteins in *Escherichia coli*. In ongoing experiments, I will screen for the ability of the proteins to interact with the ncRNAs via gel mobility shift assays. Preliminary experiments have provided evidence for interaction, supporting the hypothesized existence of these ncRNPs and providing information on their organization. The results of this work will expedite our understanding of this important class of ncRNP complexes.

Measuring Proficiency of Palm Nut (*Attalea sp.*) Cracking in Wild Bearded Capuchin Monkeys (*Cebus libidinosus*)

Tomas Pickering, CURO Summer Fellow
Dr. Dorothy Fragaszy, Department of Psychology, University of Georgia

The bearded capuchin monkeys (*Cebus libidinosus*) in Boa Vista, Brazil crack tough palm nuts using hammer stones. Cracking is an energetically costly activity. Working from an optimal foraging perspective the number of strikes is a useful proxy for the energetic costs of cracking; fewer strikes indicate greater proficiency. We analyzed the sources of individual proficiencies in cracking whole and partial nuts. The study involved direct observation of one habituated group of monkeys with twelve individuals that crack nuts. We filmed at close range the individual monkeys as they cracked nuts using a single hammer stone and anvil, and scored actions and outcomes of each cracking episode. We also obtained body weights for individual monkeys as they voluntarily stepped onto a scale. Finally we filmed one human cracking nuts using the same hammer stone and anvil as the monkeys, to provide an independent analysis of nut and anvil properties. Sufficient data were recorded on 11 monkeys for analysis purposes. Individuals required on average 7 to 76 strikes in order to crack a whole nut. Monkeys consistently placed the nuts into pits on the anvil which reduced the probability that the nut would move after it was struck and increased proficiency. Body weight was the single best predictor of proficiency, accounting for 56% of the variance. We conclude that cracking is enormously costly for

smaller monkeys. That they persist in this behavior suggests that the nuts provide a high energetic return to warrant a big investment of time and effort.

The Role of Microtubules in the Formation and Degradation of Hirano Bodies

Cleveland A. Piggott, CURO Summer Fellow, CURO Apprentice
Dr. Marcus Fechheimer, Department of Cellular Biology, University of Georgia
Dr. Ruth Furukawa, Department of Cellular Biology, University of Georgia

Hirano bodies are intracellular, paracrystalline, actin-rich structures that are most commonly found in the autopsied brains of humans suffering from neurodegenerative diseases. Because they have been mostly observed in dead cells, their purpose and structure are not well understood, but their possible link to the prevention, cure, and further understanding of neurodegenerative diseases and aging has made their study worthwhile. Recently, an in vitro model to induce formation of Hirano bodies in living cells was discovered by expressing the carboxy-terminal fragment (CT) of a 34 kDa actin bundling protein mutant (Maselli et al., 2002, 2003; Davis et al., 2008). This model allows questions regarding the physiological effects, the formation, and degradation of Hirano bodies to be investigated. To further examine what is necessary for the formation and degradation of Hirano bodies, the role of one of the major cytoskeleton components in a cell, microtubules will be studied. Using a vector with an inducible promoter for the 34 kDa protein mutant, it was investigated what the role of microtubules were in the degradation of Hirano bodies. *Dictyostelium amoeba* expressing Hirano bodies were treated with nocodazole, a microtubule depolymerizing drug. After ten hours of exposure to nocodazole, it was observed that Hirano body size was abnormally large. The results of these experiments suggest that microtubules play a role in the degradation of Hirano bodies. Further experiments are required to elucidate the

microtubule-dependent degradation process of Hirano bodies.

**George Washington and Abraham Lincoln:
Relic Veneration and "Saint"**

Commemoration in Contemporary America

Stefann S. Plishka, CURO Apprentice
Dr. Asen Kirin, Department of Art History,
University of Georgia

Relics of Christian saints and other holy figures were objects that came to hold a distinctive place in the repertoire of Christian rituals. Veneration of relics, including ceremonial use and pilgrimage, was integral to Byzantine Christianity and Constantinople's political environment due to the overlapping secular and religious roles of rulers, especially in Medieval and Byzantine Europe. Relic veneration was not a phenomenon unique to Byzantine Christianity, but the strong tradition of relic use and transfer within that region facilitated the evolution of this practice. However, during the Reformation and afterwards, Protestant Christianity eschewed that tradition of relic veneration as one of the excesses of Catholicism. In this paper, I intend to show links between the Catholic practice of relic veneration of saints and the parallel tradition in America of revering and commemorating past United States Presidents, particularly George Washington and Abraham Lincoln, as a component of civil religion, in which religious rhetoric is used to elevate the state. Due to secularization of culture and dominance of Protestantism in America, relic veneration does not hold the same value that it did in Catholic states. However, the same human desire for transcendence continues to drive people to derive a sense of continuity with great figures of the past. Thus, American civil religion has absorbed many ritualistic practices of commemoration which once had been an aspect of the Christianized state. Independent of geography, historical period, politics and religion, the evolution of commemorative practices helps identify motivating factors behind all rituals that provide transcendence.

**The Global Arms Bazaar: Lessons from the
2006 Hezbollah-Israel War**

Tyler B. Pratt, Roosevelt @ UGA
Dr. Michael Jasinski, Department of
International Affairs, University of Georgia

For four weeks during the summer of 2006, the Lebanese non-state group Hezbollah shocked onlookers by employing an unexpected arsenal of technologically advanced weaponry in its conflict with Israel. The July War heralded Hezbollah's ascent to unquestioned military primacy among non-state organizations, and Hezbollah's ability to withstand Israel's powerful retaliation earned the group a striking boost in soft power throughout the Arab world. More importantly for the United States, the month-long conflict introduced a new type of foe into the calculus of the Global War on Terror: a non-state group with all the organizational prowess, public support, and military capability of a state, without the traditional limitations of deterrence or responsibility for civilian populations. While other non-state organizations have successfully exploited asymmetrical means of combating U.S. military might, Hezbollah alone has managed to procure such a diverse array of complicated, highly specialized weapons systems and utilized them to devastating effect. This paper attempts to collect and analyze available open-source information on Hezbollah's weapons procurement efforts, revealing a highly diverse supply chain that reached into every continent. It also offers suggestions for restricting the weapons, technology, and capital that found its way into Hezbollah's extensive armory from well over a dozen countries, as well as ways to improve strategic communications efforts for containing the group's growing soft power.

The Importance of American Development Aid in Nicaragua

Lucas L. Puente, Roosevelt @ UGA
Dr. Santanu Chatterjee, Department of Economics, University of Georgia

This policy paper will focus on the strategic importance of American developmental aid to Nicaragua. In recent years, U.S. aid has decreased alarmingly, despite Nicaragua's importance in maintaining American influence in Latin America. Although the recent election of leftist President Daniel Ortega worried American investors and threatened to undermine American economic clout, Ortega has shown some pro-American tendencies in the early stages of his presidency. However, he has also worked extensively with Venezuela's Hugo Chavez to strengthen political and economic ties between the two countries. With Chavez's anti-American message gaining traction throughout the region, the United States must capitalize on Ortega's pendulum-like politics to protect its Latin American economic and political interests. The United States should increase its annual developmental aid to Nicaragua in order to strengthen long-term Nicaragua-U.S. ties. Additionally, such action would stabilize the country and catalyze economic growth through increased governmental transparency, infrastructure development, and human capital advancement. This proposal will analyze relevant economic data and academic articles as well as assess the current political state of affairs to demonstrate that increased aid will yield political and economic benefits for the United States, Nicaragua, and Latin America as a whole.

Acidocalcisome-like Granules of Chicken Egg Yolk – Polyphosphate Content and Its Relationship to Development

Adam Pyrzak
Dr. Roberto Docampo, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases, University of Georgia
Dr. Paul Ulrich, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases, University of Georgia

Acidocalcisomes are small, acidic organelles that play important roles in a variety of cellular functions as diverse as blood clotting and osmotic balance. They contain large deposits of calcium and polyphosphate, a polymeric form of inorganic phosphate. Chicken egg yolk contains large numbers of granules that are similar to acidocalcisomes in both physiology and composition. However, the relationship between the content of these granules and development is unclear. Demonstration of an acidocalcisomal role in chicken development would help delineate the function of these organelles and further establish the basis for the wide evolutionary conservation of acidocalcisomes. Preliminary experiments demonstrated that these granules react to antibodies raised against a trypanosomatid parasite vacuolar- H^+ pyrophosphatase, an enzyme that is largely responsible for the acidic pH of acidocalcisomes. In a series of immunoprecipitation analyses with chicken yolk granules, we attempted to isolate a vacuolar- H^+ pyrophosphatase. Proteins separated by SDS-PAGE were subjected to tandem mass spectrometry for identification. Additionally, we are determining the composition of the phosphate pool in the granules. Interestingly, most of the phosphate in yolk granules is present as short-chain polyphosphate, an observation also made with trypanosomatid acidocalcisomes. We plan to more accurately quantify the phosphate components of yolk granules and ultimately hope to determine their potential role in chicken development.

Characterization of Human Stem Cells Using Quantitative RT-PCR

Sharanya Raghunath

Dr. Kelley Moremen, Department of Biochemistry & Molecular Biology, University of Georgia

Human embryonic stem cells (hESCs) are pluripotent cells derived from the inner cell mass of blastocysts and have the potential for use in cell-replacement therapies for the treatment of human disease. In order to characterize the differentiation status of several hESC lines with respect to population homogeneity or heterogeneity, several marker genes have been used to determine the extent to which the cells are pluripotent or differentiated into various germ layers. We have assembled a list of 25 genes which comprise markers for pluripotency (Oct4, Nanog, Sox2, Lefty A/B, Tert and c-myc) and markers for several differentiated lineages, including mesoendoderm (Brachyury, Wnt3a and MixL1), definitive endoderm (Sox17, Gata4, Gata6, Foxa2, Cxcr4 and Goosoid), mesoderm (Tbx5, Tbx20, Islet1, Nkk2.5, FoxF1 and Eomes), neural ectoderm (Sox1, Nestin and Pax6), and extraembryonic endoderm (AFP). Using a previously established quantitative real time Polymerase Chain Reaction (qRT-PCR) approach, we analyzed the transcriptional profiles for the list of marker genes in five different hESC lines (BG01, BG01, BG03, H7 and H9) to determine the level of heterogeneity and differentiation of these cell populations both in the undifferentiated and chemically differentiated states. The results obtained from this study will be used to select a group of reliable marker genes for the characterization of hESC populations prior to more extensive high-throughput transcript analysis investigating changes in glycan-related genes during cell differentiation.

Functionality of Glutamate Receptors in hESC-derived Neural Progenitors vs. Matured Neurons

Anita C. Randolph

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

Glutamate is the most predominant excitatory neurotransmitter in the central nervous system, and therefore glutamate receptors play a prominent role in the function and development of the nervous system. Abnormalities in their expression can cause major problems in memory formation and diseases such as epilepsy, ischemic cascade and Alzheimer's diseases. We are assessing functionality of glutamate receptors in a previously established neural progenitor (NP) cell line derived from WA09 human embryonic stem cells. Characterizing this system provides a unique model for studying neural development and function in the human system. NPs have the potential to grow in a monolayer and differentiate to mature neurons that have been shown to express several subtypes of glutamate receptors. Over stimulation of certain glutamate receptors can lead to excitotoxicity. This occurs when receptors are overactivated, allowing high levels of calcium ions to enter, damage the cell, and signal apoptosis. If the receptors are functional, we should see a concentration-dependent increase in cell death due to apoptosis. This can be readily assayed using a high-throughput kit that measures cytotoxicity and viability of the cells. Once this assay is optimized for plating density, cells will be exposed to glutamate at varying concentrations and evaluated for cytotoxicity due to over-stimulation of receptors. The next step is a protection assay that will screen known inhibitors of the receptors and protect them from excitotoxicity. Successfully characterizing functional receptors on these neurons may lead to their use in screening of potential drug treatments for patients with central nervous diseases.

In Vitro Assay to Measure Cell Growth and Invasion

Claire M. Rice

Dr. Bruce LeRoy, Department of Pathology,
University of Georgia

Many tests used to measure the effects of new chemotherapy drugs are first performed in live animals, as the technology has not evolved sufficiently to provide a completely suitable *in vitro* system for evaluating cancer cell growth and invasion. However, several *in vitro* assays are currently being developed for such experiments. Increasing use of laboratory tests to evaluate these processes serves the important goal of reducing the numbers of research animals used in the testing process. The purpose of this presentation is to describe several of these methodologies and how they were used to evaluate growth and invasion of a canine prostate carcinoma cell line. A canine prostate carcinoma cell line was used to study the effects of cyclooxygenase-2 (COX-2) inhibitors on the growth and invasiveness of cancer cells. Following treatment with deracoxib or carprofen, *in vitro* effects on ACE-1 cell invasion were measured using a Boyden chamber assay and an *in vitro* wound healing system, as well as growth of the cells in soft agar. Other *in vitro* methods which are being used to evaluate cancer cell growth and invasion include flow cytometric analysis of adhesion molecules, confocal microscopy, apoptosis assays, and static adhesion assays. The data from the experiments which were performed suggest that COX-2 inhibitors may be of therapeutic benefit in prostate cancer by reducing the invasion and growth of neoplastic prostate cells. The results of these experiments also show that *in vitro* methods can successfully be used to study growth and invasiveness of cancer cells.

Identity Achievement as a Function of Age, Gender, and Ethnicity

Amanda N. Rinehart

Dr. Douglas Kleiber, Department of Counseling
& Human Development, University of Georgia
Dr. Pedro Portes, Center for Latino
Achievement & Success in Education,
University of Georgia

Identity formation is one of the most challenging developmental issues adolescents and young adults face. It has been generally presumed that identity formation progresses in the same way for all individuals, but previous research has been done primarily with white, Anglo-Saxon males. Adolescents and young adults construct their meanings of self in social contexts, so this study was conducted to explore whether identity achievement differs by gender and ethnicity. . New research is necessary to gain a comprehensive understanding of identity formation as a critical developmental process that is affected by life circumstances. Furthermore, it is important to continue to evaluate the effectiveness of the instruments used to assess such a complex construct. Several instruments have been used to assess identity formation in the past but have led to different findings. In this study, a convenience sample of 326 males and females from different ethnic groups between the ages of 11 and 36 were given two identity development measures: the Ego Identity Process Questionnaire (EIPQ), and the Identity Status Interview (ISI). Findings will be reported according to age, gender, ethnicity, and their interaction. Consistency or inconsistency in the results as a function of the measure used will determine the validity of the group differences identified as well as reflecting on the validity of the measures. Differences among age groups are to be expected; differences in gender and ethnicity are yet to be established.

Avoiding Overcorrection: Solving the Army's Readiness Crisis

Robert Rosenbleeth & Rocky T. Cole, Roosevelt @ UGA

Dr. Patricia Sullivan, Department of International Affairs, University of Georgia

To many in the U.S. military, Operation Iraqi Freedom shows that the Army lacks enough personnel to fight the “long war” against Islamic extremism. In response to this concern, the Department of Defense is pushing for a permanent 65,000 soldier increase of the Army’s end strength, the legislated number of active-duty personnel that the Army must employ. However, this increase constitutes a dangerous overcorrection for the Army’s shortcomings in counterinsurgency operations—protracted, low-intensity conflicts against radical guerillas. Significant “boots on the ground” will not effectively quell asymmetric insurgencies. The Defense Department’s plan will only burden the military with massive expenses. These funds would be better spent on training and technology—force multipliers essential to future military successes. The Army should maintain its end strength around the current level and focus on building a highly trained and smartly equipped force. Investing in advanced communication technology, robotics, and extensive training—specifically academic training in military strategy, sociology, and linguistics—will transform the Army into a versatile expeditionary force. Because of its higher per unit lethality and specialization in counterinsurgency and counterterrorism operations, creating such a force will negate the need for more “boots on the ground” and increase the Army’s success in future conflicts. To compensate for the loss of traditional infantry capabilities, Congress should expand the National Guard to create a force of “citizen soldiers” that can be quickly deployed if the strategic environment justified a large infantry operation. To support our argument, we present a review of recent military and scholarly analysis of the strategic lessons being learned in Iraq.

Understanding M16A Metalloprotease Enzymology

Jarrad W. Rowse, CURO Scholar

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

The human insulin-degrading enzyme (IDE) has the ability to degrade the A β peptide. Because accumulation of A β in the brain is believed to be a causative agent of the neurodegenerative Alzheimer’s disease (AD), IDE has become a potential drug target for the prevention and treatment of AD. IDE has significant sequence homology to metalloproteases in a wide range of other species, including the yeast metalloprotease Ste23p that functions in a-factor mating pheromone production. These homologous proteases are collectively classified as M16A metalloproteases. Yeast are used as a model system to evaluate the hypothesis that M16A enzymes have similar substrate-specificities. This system is used to compare the activities of various mutant M16A metalloproteases in an effort to understand the functional impact of charge switch mutations on M16A metalloprotease. This model system has also been used to determine the essential elements of the *STE23* promoter. By evaluating yeast mating ability and using immunoblotting techniques to assess expression levels, it has been determined that neither the predicted initiator methionine residue of Ste23p nor the upstream promoter region (nearly 400 residues) is required for the production of functional Ste23p but is integral in transcriptional initiation. These results are providing insight into the physiological relevance of Ste23p and other M16A metalloproteases by offering an understanding of their transcriptional initiation mechanism and the relationship between structure and function. Ultimately, these studies could lead to the development of a hyperactive enzyme with therapeutic advantages as a treatment for the accumulation of amyloidogenic plaques.

The Impact of Chinese Product Fraud and Lack of Quality Control on U.S. Commercial Trade Laws and Regulations

Meghan A. Royal

Prof. Marisa Pagnattaro, Department of Legal Studies, University of Georgia

Commercial markets across the globe are beginning to rely more heavily on exported goods and services from one of the world's strongest industrial powers, the People's Republic of China. Although these advances in international trade promote cooperation between nations, conflicts in quality regulations and product fraud have presented numerous problems for many American companies who engage in business with Chinese manufacturing corporations. Commercial laws define and shape our nation's business interactions with foreign manufacturers, as well as safeguard our country's economy and protect American consumer's interests. The purpose of this paper is to discuss possible solutions to a number of these issues as well as possible modes of conduct that will hopefully produce a successful global trade economy and culture. This paper investigates many areas of international trade, focusing specifically on our relationships with China. Part II reviews various guidelines and agreements that govern the realm of global commerce, taking a special look at U.S. domestic policies that affect trans-national trade. Part III analyzes World Trade Organization policies as well as a few of the organization's recent dispute hearings between the two nations. Part IV discusses recent cases of product fraud and the quality controls that are implemented and enforced by both the U.S. and Chinese governments. Part V analyzes both U.S. and Chinese legislation recently put into practice to correct the damages made, as well as proposes possible solutions that could be adopted by American businesses and organizations to further protect U.S. consumers from harmful imports.



Project Runway: Untitled

Lindsay MacLean Ruderman, Susan Kent & Rachel Huggins

Prof. Clay McLaurin, Department of Fabric Design, University of Georgia

Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

In this collaborative project and runway exhibition by Jewelry/Metalsmithing students of Professor Mary Pearse and Fibers students of Professor Clay McLaurin, material, adornment and body as site are examined and performed, taking cues from Visiting Artist Anya Kivarkis, and the publication "Fashion at the Edge." For one week, these students worked in teams of five with non-traditional materials, manipulating paper towels, hosiery, window screening and roofing shingles into performative, and in some cases spectacular, wearable art.

We chose to address the idea of consumption in society and explore the opposition of

manufactured consumer products and the natural human body. Transforming consumable paper products into a beautiful piece that takes over the body speaks to the trend of over-consumption that is so prevalent in our society.

Materials: Nylons, batting

A Feasible Trilateral Agreement: A Convergence of Interests

Aaron M. Sayama, Roosevelt @ UGA
Dr. Seema Gahlaut, Center for International Trade & Security, University of Georgia

India and Japan have become increasingly important in the Asian theater over the past decade. Their economic growth during this period has been accompanied by significant changes in their security perspectives: they are keen to play an active role in spreading democracy and partnering with the United States to help maintain the economic and security architecture of Asia. As U.S. policymakers grapple with the challenge represented by the rapid growth of China and its impact on Asian security and economy, India and Japan are getting a closer look as long-term U.S. partners. Accordingly, creating a trilateral cooperation through informal and formal agreements between the United States, India, and Japan would further the best interests of all three nations. In fact, these three powerful states have already begun the process of coordinating policies in order to shape regional dynamics in Asia to best suit their converging interests. This paper will address the economic and political areas that can most immediately serve to cement a Japan-India-U.S. trilateral agreement. Four areas of cooperation are identified: new security architecture in Asia, increased economic interdependence, collaboration in nuclear energy, and efforts to establish and spread democracy. In each area, I will discuss what is already taking place and how to encourage this burgeoning alliance. The paper will also address how to tackle thorny diplomatic issues, such as preventing a counter-alliance from developing among other Asian nations.

Relationships Between Psychosis Risk Scales and Antisaccade Performance

Julia R. Schuchard
Dr. Jennifer McDowell, Department of Psychology, University of Georgia

The relationships between psychosis risk scales and antisaccade performance may further the understanding of the development of symptoms often seen in people with schizophrenia, including hallucinations and delusions as well as flat affect. Research suggests that non-clinical individuals who have minor manifestations of those symptoms, such as perceptual abnormalities and anhedonia, are at greater risk of developing psychosis. Furthermore, people with schizophrenia and people at risk for schizophrenia by virtue of biological relatedness to someone with the disorder make more errors of inhibition as assessed by antisaccade tasks. Antisaccade tasks require rapid eye movements to the mirror image location of a peripheral stimulus (same amplitude, opposite side). Considering the demonstrated relationships between schizophrenia and antisaccade performance, we hypothesized that a positive relationship will exist between antisaccade errors and scores on scales assessing odd and unusual experiences that are associated with risk for developing psychosis. In the present study, normal undergraduate participants responded to 179 items of the Chapman Psychosis Scale, using the following subscales: Perceptual Aberration, Magical Ideation, Physical Anhedonia, and Revised Social Anhedonia. Participants also performed antisaccade tasks, which were scored in terms of the numbers of errors and the required processing time (latencies) and accuracy (eye amplitude/target amplitude) for correct responses. We compared antisaccade performance between extreme groups on the psychosis risk scales. We also correlated antisaccade error rates with individual subscale scores. If significant relationships between psychosis risk scales and antisaccade performance are found, they may help identify individuals at greater risk of developing psychosis.

Effects of Initial Population Size and Food Quality on Stochastic Population Persistence

Jeff Shapiro

Dr. John Drake, Eugene Odum School of Ecology, University of Georgia

Extinction is a fundamental problem for ecological theory, yet theory currently far outstrips the experimental support needed to empirically distinguish alternative models. For example, theory predicts that small initial population size has a negative effect on stochastic population survival. Few empirical studies have tested this theory and conflicting results have been produced. We examined the influence of initial population size, habitat size, and food quality on persistence times and population growth of laboratory *Daphnia magna* populations. We hypothesized that (1) lower initial population sizes would be more vulnerable to stochastic factors and should therefore have shorter persistence times, and (2) both larger habitats and more nutritious food sources would increase carrying capacity, thus should support increasing population persistence. 60 experimental habitats (30 1400mL and 30 700mL tanks) were inoculated with 1, 2, 3, 4, or 5 *D. magna*. 30 tanks were fed a live green alga from the genus *Selenastrum* (nutritious treatment) while the rest were fed a suspension of pulverized blue-green alga *Spirulina* (less nutritious). After 5 weeks, uncontrolled growth of *Selenastrum* in tanks confounded the data, thus producing results contrary to predictions of a standard model. We then eliminated the food quality variable by feeding *Spirulina* to all populations and started a new trial. Data as of 1/7/2008 indicates a probable effect of initial population size ($p = 0.089$) and habitat size ($p = 0.024$) on persistence times. By the experiment's end, our study will confirm the validity of current extinction models and give direction to wildlife managers.

Functional Characterization of a Putative Inositol-1,4,5-Trisphosphate Receptor in the Parasite *Trypanosoma brucei*

Edgar A. Shartilov

Dr. Silvia Moreno, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases, University of Georgia

Dr. Paul Ulrich, Department of Cellular Biology, Center for Tropical and Emerging Global Diseases, University of Georgia

Trypanosoma brucei brucei is the causative agent of nagana in Africa and is closely related to *T. b. rhodesiense* and *T. b. gambiense*, which cause sleeping sickness or African trypanosomiasis. Calcium signaling pathways in trypanosomatid parasites have large influences on cell differentiation and invasion but are largely undescribed. In a proteomic analysis of subcellular fractions, we identified a putative inositol-1,4,5-trisphosphate receptor in *T. brucei* (TbIP3R) and we are determining its function by blocking its expression. Double-stranded RNA interference (RNAi) in *T. brucei* inhibits gene expression and degrades RNA molecules by targeting transcripts of specific genes. We cloned the C-terminal (Ct) and N-terminal (Nt) region of TbIP3R to generate RNAi constructs. We ligated the constructs into the RNAi vector p2t7tiB and transfected procyclic stages of the 29-13 strain of *T. brucei*. We analyzed the effects of TbIP3R knockdown on cell growth of transfected cells. Using this RNAi cell line, we plan to determine the effects of TbIP3R knockdown on parasite virulence, calcium signaling, and responses to environmental stress.

Characterization of *Mycobacterium shottsii*

Purvi S. Sheth, CURO Summer Fellow, CURO Scholar

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

Mycobacterium shottsii is a slow-growing bacterium that was isolated from lesions in striped bass in the Chesapeake Bay within the past decade. It remains unclear whether this bacterium is an etiological agent of disease. Therefore, our goals are to develop molecular

biological methods and infection model systems to more closely study this new species. One emphasis of the project was to examine antibiotic resistance in *M. shottsii*. The minimum inhibitory concentrations of the drugs kanamycin and hygromycin were determined. Another goal of the project was to determine if *M. shottsii* has a mycobacteriophage L5 attachment site on its chromosome. Such a site is present on several other mycobacterium species. The presence of the site is useful to researchers as it provides a location where genes of interest can be introduced and expressed in single copy. To test this hypothesis, *M. shottsii* bacteria are transformed with a suicide plasmid (encoding the mycobacteriophage L5 integrase and attachment site and an antibiotic resistance gene) and spread onto plates containing selective medium. The results of this study are pending as this is an extremely slow-growing bacterium on agar media. If colonies appear on the plates, they will be screened by PCR for DNA specific to the suicide plasmid. If the appropriate-sized product is detected, then it will support the hypothesis that this species contains the mycobacteriophage L5 chromosome integration site. Since *M. shottsii* was isolated from an aquatic source, we examined whether the bacterium survives within amoebae, as has been reported for other mycobacterium species. To investigate this question, *M. shottsii* previously-transformed to express green fluorescent protein (GFP) was mixed with amoebae and examined over time. In our initial studies, bacteria expressing GFP were detected inside of the amoebae after a few days of incubation suggesting that this species can survive inside of amoebae. Whether it can persist for much longer periods of time is under investigation.

The Naturally Attenuated TCC Strain of *Trypanosoma cruzi* Induces a Specific CD8+ T Central Memory Response

Laura J. Simpson

Dr. Rick Tarleton, Department of Cellular Biology, University of Georgia

Trypanosoma cruzi is the causative agent of Chagas disease, a major health concern in Latin

America today. Experimental vaccination in animal models has shown that TCC, a naturally attenuated strain of the parasite, provides protection against a virulent infection. This research project aims to characterize the immune response against the TCC strain mediated by T lymphocytes expressing the surface marker CD8. Inoculation of TCC parasites induced specific CD8⁺ T lymphocytes that were detected using major histocompatibility complex class I tetramers containing the immunodominant *T. cruzi* trans-sialidase peptide, TSKB20. Expression of the surface molecules CD62L and CD127 on CD8⁺ T lymphocytes suggests that the majority of these cells are central memory cells, a group of long-lasting memory cells considered to be important in vaccine-induced protection. As TCC parasites are not directly detected in the blood of infected mice, hemoculture and Real Time PCR of tissues from immunosuppressed mice were used to demonstrate parasite persistence. These results suggest that TCC parasites persist in low numbers and induce a central memory response. A predominance of central memory CD8⁺ cells has not been previously described in a model of persistent *T. cruzi* infection. Future experiments will help characterize the kinetics of the CD8⁺ response and the protection capacity provided by either oral vaccination with TCC or after TCC parasite clearance by drug treatment. This research provides insight into the immunological basis of protection induced by TCC parasites, and will help build a framework for testing experimental vaccines of genetically engineered parasites.

**"In the Shadows of Espionage":
Extraordinary Rendition as a Threat to
American National Security**

Rachel A. Spencer & Sarah Vaughn, Roosevelt @ UGA

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

Since the Clinton administration, the U.S. has challenged internationally accepted standards and laws by using extraordinary rendition. This process, conducted in the "shadows of

espionage" involves the abduction of suspects on domestic and foreign soil intending to transport them to 'black sites.' Here, the Central Intelligence Agency (D/CIA) often charges agents of other nations to employ a range of harsh interrogation methods, while also precluding the U.S. from claiming a 'moral high ground,' and much needed legitimacy in the ongoing war on terror. We therefore propose the U.S. reject the use of rendition in favor of legal and moral approaches to intelligence.

Specifically, we recommend Congress pass legislation calling for the utilization of judicial processes in the accused native's country or formal extradition, thereby providing such investigations with oversight. The U.S. should properly enforce the Alien Tort Claims Act and ratify the U.N. Convention Against Torture to earn the trust of the global community and uphold the ideals of democratic institutions. The goal of our research is to demonstrate that renditions not only severely harm America's reputation abroad but, paradoxically, undermine our national security by causing other nations to openly debate that the U.S. actually lack the ideal it claims to maintain. To achieve this, we will present legal and normative examinations of international conventions, foreign treaties, speeches, academic literature, print media, and the Constitution. Although the implementation of this proposal would face obvious challenges, the benefits to American national security and reputation would far outweigh them.

The Distribution of Rabies Antigen by Immunohistochemistry in the Brains of Different Mammalian Species

Lindsay T. Stein

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

Rabies is a fatal zoonotic viral infection of the central nervous system, affecting different parts of the brain in different species. It is transmitted by the bite of a rabid animal and is capable of infecting all mammalian species. In the United States in 2006, there were 6,940 reported cases of rabies in animals and 3 cases in humans. Approximately 92% of the cases were in

wildlife, and 8% were in domestic animals. Rabies is usually diagnosed by the detection of a viral antigen in the brain by using a direct fluorescent antibody test (FAT), or by the presence of intracytoplasmic eosinophilic inclusion bodies (Negri bodies) of the neurons associated with nonsuppurative meningoencephalitis in routine histological preparations. However, neither of these techniques are satisfactory as FAT requires manipulating samples that have an active virus, and detection of Negri bodies is possible in only 50-80% of cases. Another technique that has recently been applied is immunohistochemistry, which is as sensitive as FAT, but is performed on fixed samples, so there is no operator exposure. The objective of our study is to use IHC to better characterize the distribution of the antigen in different segments of the brain in several species naturally infected by rabies, including horse, cow, sheep, goat, dog, cat, raccoon and skunk. This will improve diagnosis of the disease by establishing the better location for selection of fragments for FAT, and histopathologic changes, including Negri bodies.

Diversity and State-Building: A Cross-Country Analysis of the U.S. and Canada

Karen E. Tanenbaum

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

The United States and Canada, beacons of democracy and diversity in the Western world, have taken dramatically different approaches to ethnic and racial diversity in their democracy-building. Canadian state institutions generally are more socially and politically inclusive of minority groups, while those of the U.S. generally are less inclusive and more particularistic. Correspondingly, minorities in the U.S. continue to experience disproportionately greater poverty and challenges in access to education and health care than their Canadian counterparts. This essay attempts to explain these divergent outcomes in the state's accommodation of internal diversity. More specifically, it strives to uncover the factors that enabled and encouraged Canadian

(and discouraged American) state involvement in the accommodation of minority groups through the public sector. I isolate three factors—one social, one institutional and one political—that arguably influence this outcome: 1) the level of social or generalized trust among citizens, 2) the path-dependency or tendency towards the status quo of political institutions (beginning with their formations in response to revolutionary change), and 3) the size and bargaining power of their respective minority groups. Each of these variables partially explains a state's level of involvement in the accommodation of minorities. However I hypothesize that the third explanation, the size and bargaining power of a given minority group, carries the most weight in influencing relevant policy outcomes. This comparative study strives to illuminate the dominant forces behind minority policies in the U.S. and Canada and to encourage a critical re-examination of the relationship between diversity and democracy.

Mixed Income Housing: A Comprehensive Reconstruction Plan for New Orleans

Lila E. Tedesco, Roosevelt @ UGA
Dr. Andrew Carswell, Department of Housing & Consumer Economics, University of Georgia

Even prior to Hurricane Katrina, poverty has plagued New Orleans. Katrina has created the unique situation in which nearly all of the parishes must be rebuilt, granting an opportunity to address this historic problem. This paper explores the benefits of mixed-income housing as an effective development strategy to expand the social mobility of the lower classes and proposes an optimal method toward comprehensive neighborhood development, using the city of New Orleans as a case study. Mixed income housing deconcentrates poverty and integrates classes to create a stimulating environment that leads to community improvement on the whole and opens opportunities for individual residents. I measure the effectiveness of this implementation using Thomas Boston's Quality of Life Index, which consists of both family and neighborhood indexes and which has been used to show the

effectiveness of other mixed-income projects in Atlanta and Chicago. Follow-up programs such as job placement, housing counseling, and access to public services ensure the benefits of mixed-income housing. Using theories of "New Urbanism" enhances the community aesthetics, making the community appealing to all income levels. Funding for this effort would come from a variety of established federal initiatives such as housing trust funds and low-income housing tax credits. Incorporating these developments into the Unified New Orleans Plan coordinates reconstruction to prevent isolated developments. A cohesive and economically integrated rebuilt New Orleans promises a future free of the social ills that the city has battled in the past.

Project Runway: Screen Study

Marie Tetzlaff, Allison Sheats & Kathleen Janvier
Prof. Clay McLaurin, Department of Fabric Design, University of Georgia
Prof. Mary Pearse, Department of Jewelry/Metalsmithing, University of Georgia

In this collaborative project and runway exhibition by Jewelry/Metalsmithing students of Professor Mary Pearse and Fibers students of Professor Clay McLaurin, material, adornment and body as site are examined and performed, taking cues from Visiting Artist Anya Kivarkis, and the publication "Fashion at the Edge." For one week, these students worked in teams of five with non-traditional materials, manipulating paper towels, hosiery, window screening and roofing shingles into performative, and in some cases spectacular, wearable art.

This piece stems from a purely formal materials study, which seeks to upset traditional knowledge of fiberglass mesh as a flat, transparent substance by forming it into volumetric shapes that overlap to create an opaque garment. As each modular unit builds on the next, the bulging screen begins to blur the figure of the model beneath while obscuring any reference to more conventional dress shapes on the exterior. Both the material and its

unorthodox handling help make this piece less of a dress itself and more about the idea of a dress.

Materials: Mesh Fiberglass

Perceptions of Puerto Rican Women and Their Impact on Public Health Policy in the Early 20th Century

Adam Thomas

Dr. Reinaldo Román, Department of History, University of Georgia

This presentation will reveal the negative impact that U.S. government depiction of Puerto Rican women had on policy, both in the United States and on the island of Puerto Rico. This will be done through an analysis of the portrayal of these individuals in government literature. I will begin with a brief discussion of the history of public health in the United States, then continue into a short analysis of the reasons for U.S. occupation of the island. Next, I will proceed into a depiction of areas of control that the government exerted during the period—the health of American service men, the economics of Puerto Rico, and the political realities of Puerto Rican women. The health of U.S. service men received extensive attention, often expressed in terms of sexuality, with these men encouraged to avoid sexual contact with "dirty women," and when necessary, utilize some form of prophylactics, which were still taboo among mainstream society. The presence of prostitution on the island furthered the negative portrayal of women and in turn fed the government's ability to deny them political rights, as they were "subverting the social norms" of the island. It also provided one means with which the United States was able to deny Puerto Rico political independence. I will conclude by discussing the impact these policies have had on contemporary Puerto Rico and analyze what, if any, changes can be made to alleviate them.

Comparison of the Acute Toxicity of Selective Serotonin Reuptake Inhibitors (SSRIs) and St. John's Wort (*Hypericum perforatum*) to *Ceriodaphnia dubia*

Yen Tran

Dr. Marsha Black, Department of Environmental & Health Sciences, University of Georgia

The Clean Water Act prohibits the discharge of materials in toxic amounts to the waterways of the nation. St. John's Wort (*Hypericum perforatum*) has been widely used as an herbal anti-depressant drug. Recommended dosage is three 352 mg capsules daily. When St. John's Wort is excreted from the urinary system of consumers, it maintains some of its active ingredients, hypericin and hyperforin. If the active substances are not removed or degraded by wastewater treatment and occur at sufficiently high concentrations, they may have toxicity to aquatic life. In the present study, acute toxicity tests were used to determine the potential toxic activity of St. John's Wort in a model aquatic organism. *Ceriodaphnia dubia* were exposed to various dilutions of St. John's Wort, and LC50s were calculated to determine the mortality rate. Average LC50s for St. John's Wort at 24 and 48 hours were 50.8 and 34.3 mg/L, respectively. Thus, aquatic organisms may risk toxicity if they are continuously exposed to St. John's Wort. Compared with the prescription antidepressants (SSRIs), St. John's Wort is 10-244 times less toxic. At high consumption and excretion, St. John's Wort could cause similar risks of toxicity to aquatic organisms as SSRIs. Further chronic toxicity tests and aquatic analyses are needed to determine concentrations of St. John's Wort that may harm aquatic environments.

IS492 Movement on the *Pseudoalteromonas atlantica* Chromosome

Steven P. Trau

Dr. Anna Karls, Department of Microbiology, University of Georgia

Pseudoalteromonas atlantica is a primary biofilm-forming marine bacterium. Biofilm formation requires production of extracellular

polysaccharide (EPS). In *P. atlantica*, EPS production (+/-) and the associated colony morphology [mucoid (+) or crenated (-)] is controlled by movement of a mobile element, IS492. Excision of IS492 from *epsG* allows for the production of EPS and yields a mucoid phenotype while insertion of IS492 into *epsG* yields a crenated phenotype. *P. atlantica* contains five copies of IS492 in its genome including the *epsG*-associated copy. The precise excision of the *epsG* copy of IS492 occurs at a fairly high frequency (10^{-3} /cell/generation) and leaves the chromosome with four copies of IS492. Current research suggests that low frequency insertion of IS492 into *epsG* (10^{-6} /cell/generation) occurs by replicative transposition of another chromosomal copy thus leaving a copy at the donor site while inserting a copy into *epsG*. To investigate the movement patterns of the chromosomal copies of IS492 Southern blot analyses are performed with chromosomal DNA from mucoid and crenated isolates which come from multiple, vertical generations of a specific *P. atlantica* strain. The probe used for detection of IS492 in the Southern blots is a PCR product corresponding to the first 744 base pairs of IS492 which is labeled with digoxigenin (DIG) and detected by binding of anti-DIG antibody that is linked to chemiluminescence or colorimetric enzymes. This Southern analysis will test whether precise excision of IS492 is linked to insertion at any site on the *P. atlantica* chromosome.

African-American Models of Success

Darryl Tricksey, CURO Apprentice & Dacia McCray, CURO Apprentices

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

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

What predicts success for African-American students at a majority White institution? Past research has shown that trust of a majority group, stereotype threat, racial identity, and educational beliefs predict academic excellence among African-Americans. Absent from these investigations, we argue, is consideration of

pervasive African-American models of success, that is, personal definitions and connotations about success and its attainability. The present study will be the first to examine African-American models of success, taking into account both the various factors that have predicted achievement and their interaction. We are currently working with focus groups to design a survey funded by a RED seed grant that will be used to measure aspects of models of success within a diverse, randomly selected pool of African-American students. The focus groups will allow us to include any overlooked variables, reaffirm the inclusion of existing variables, and establish new links among existing variables. We believe our research will show that models of success can act as predictors of both performance outcomes and aspirations. We also hope to gain further insight into connections between racial identity, trust and security, educational beliefs, and other variables as they relate to models of success. Ultimately, we hope to generalize the construct of African-American models of success in majority White institutions and publish our work in order to encourage the adoption of best practices.

Antonio Vivaldi's Contribution to the Evolution of Program Music

Robert M. Truan

Dr. Susan Thomas, Department of Musicology & Ethnomusicology and Institute for Women's Studies, University of Georgia

A composition in which a composer attempts to aurally depict a predetermined narrative is known as program music. Antonio Vivaldi's (1678 – 1741) *The Four Seasons* (1725) is a series of four violin concertos representing the yearly seasons through music composition by accompanying each score with a seasonal sonnet. Even though program music is regarded as a nineteenth century phenomenon, *The Four Seasons* can be seen as an early contributor to the practice. In this paper, I demonstrate three ways in which *The Four Seasons* can be seen as proto-programmatic music. Through analysis of the music score, I show how Vivaldi's

composition uses musical sound to express non-musical elements. I also suggest how historical precedents to program music influenced Vivaldi's composition, particularly the process of vocal madrigalisms' application to instrumental music. Madrigalisms refer to a compositional technique of their genre, Italian madrigals, in the sixteenth century. Finally, the literary basis for the provided sonnets in *The Four Seasons* will reveal the external program that Vivaldi attempts to depict. Compositional techniques that Vivaldi used were innovative not only for their time but also shed light on the development of program music.

A Cross-Cultural Comparison of Gender and Role-Identities in China and the United States

Traci N. Tucker, CURO Summer Fellow, CURO Scholar

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

This study seeks to understand how cultural evaluations of an occupation influence the way in which we gender that occupation. According to Affect Control Theory, individuals seek to maintain their definitions of the situation (their expectations for a particular event). Thus, this study investigated the prediction that the more similar the cultural meanings attached to a particular occupational identity are to the cultural meanings attached to a gender identity (e.g., Man, Woman), the more gendered will be our expectations of that occupational identity. Gender and occupational meanings from the U.S. and China, measured in Evaluation, Potency, and Activity, were used to create a measure of distance between gender meanings and the meanings attached to a list of various occupational identities. A cross-national survey was then conducted in which 42 undergraduate students from a large university in the United States and 46 undergraduate students from a large university in southeast China provided ratings about whether the most appropriate occupant of each identity would be a man, a woman, or either. These ratings were compared against predictions generated from Affect Control Theory based calculations of meaning-

distance. Logistic regressions examined whether these meaning-distances predicted assessments of gender appropriateness for occupational identities. Results suggest that gender appropriateness is defined primarily by the relation of the occupational identity to the role of woman. The occupational identities' relation to the role of man appears to be less salient in the gendering process.

RGS Regulation of the LPA Signaling Pathway in Prostate Cancer Cells

Kathryn L. Turner

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

Lysophosphatidic acid (LPA) is a signaling molecule that induces proliferation, migration, metastasis, and survival in prostate cancer cells by activating cell surface G-protein coupled receptors (GPCRs), which in turn activate G-proteins. Regulators of G-Protein Signaling (RGS) proteins deactivate G-proteins, thereby stopping the signal. In cancer cells these G-proteins are active, leading to increases in the signal and cancerous activity. RGS proteins are likely therapeutic targets, because there are many different forms that bind specifically to different G-proteins, therefore ones utilized in prostate cancer can be identified. Our hypothesis is that RGS proteins are present in the cells and regulate G-proteins involved in LPA signaling in prostate cancer cells. The effects of LPA were determined by testing the amounts of different second messengers, specifically cyclic adenosine monophosphate (cAMP) and inositol phosphate (IP), which vary depending on the level of LPA activation. The results reveal that prostate cancer cells are affected by LPA, with increases in LPA leading to changes in second messenger production, suggesting that the LPA pathway is present in prostate cancer cells. By studying the differences between RGS sensitive and insensitive G-proteins, we can determine the effect of RGS proteins on this pathway. If it is found that RGS proteins regulate this LPA signaling pathway and are present in the cell, then further research can be done to identify

which RGS proteins are involved in prostate cancer and which could be used as therapeutic targets.

An Investigation of the Relationship between the Existence of Inc A/C Plasmids and the Prevalence of Multiple Therapeutic Antibiotic Resistances

Matthew A. Turner

Dr. Susan Sanchez, Department of Pathology, University of Georgia

The possible correlation between high use of therapeutic antibiotics in food animals and increased antimicrobial resistance in bacteria has drawn increased public attention. Recent work indicates that Inc A/C plasmids, such as pSN254, may be a source of the correlation, serving to pass multiple antimicrobial resistances, including streptomycin, tetracycline, and several others, by plasmid conjugation between normal flora of the G.I. tract and Salmonella serotypes passing through animals. This study was designed to determine the abundance of Inc A/C plasmids in bacterial isolates from cattle and the potential relationship between these plasmids and the presence of multiple drug resistances. The repA gene was used as an indicator of the presence of Inc A/C plasmids and was identified through the use of PCR analysis and gel electrophoresis. Both Salmonella and normal flora isolates from farms in Northeast Georgia and Salmonella isolated from clinically sick cattle around the state of Georgia were tested. 100% of Salmonella isolates from healthy farm cattle tested positive for the repA gene, while clinical isolates rarely tested positive other than in Salmonella Newport serotypes. In order to determine if there is a correlation between these plasmids and resistances, we examined phenotypic resistances of repA positive, normal flora isolates from the same farm. Results indicate that 79.3% of repA positive samples demonstrated strA resistance, 86.2% demonstrated strB resistance, and 86.2% demonstrated tetA resistance. The isolates demonstrated several other resistances as well, but those demonstrated lower levels of correlation with the repA gene. These results

indicate strong possibilities of a correlation between Inc A/C plasmids and these resistances, that the normal flora may frequently carry these Inc A/C plasmids, and that Salmonella Newport strains may be more likely than other strains to carry these plasmids.

SPQ-Identified Schizotypy and Antisaccade Performance in a Normal Population

Manouela V. Valtcheva

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

People with schizophrenia have problems inhibiting inappropriate behavior. One simple measure of inhibition is via antisaccade tasks during which subjects are instructed to inhibit a glance to a target and generate a glance to the mirror image location. Errors towards the target are reported more frequently in people who are related to someone with the illness (and therefore at greater risk for developing the illness themselves). People who have schizotypal personality characteristics (unusual experiences such as illusions, magical thinking or suspiciousness) often display behavioral and psychophysiological measures similar to those in people with schizophrenia. The purpose of this study is to investigate whether there is a relationship between increased antisaccade errors and questionnaire-identified schizotypal traits in subjects who do not have a family history of schizophrenia. Participants from the undergraduate research pool were screened for psychiatric history before they participated. Participants also completed a self-report Schizotypal Personality Questionnaire (SPQ) and were measured on antisaccade performance. Group comparisons of participants at the low and high extremes of the distribution of antisaccade error rate were conducted to investigate the association between SPQ scores and antisaccade performance. It is hypothesized that a positive relationship will exist between schizotypal symptoms and error rates. Such results would demonstrate the presence of critical psychophysiological characteristics in a normal undergraduate population. Furthermore, the possibility of studying schizophrenia-risk in

normal subjects who have distinct patterns of scores on these measures would greatly enhance our ability to research related issues in an unimpaired group.

Does Writing Ability Predict Academic Achievement? Evidence from the New SAT Writing (SATW) Section

Jessica N. Van Parys, CURO Summer Fellow
Prof. David Mustard, Department of Economics,
University of Georgia

In 2005, the College Board substantively altered the format and content of its SAT Test by adding a writing section (SATW) to the existing verbal (SATV) and math (SATM) portions. No research exists on the extent to which the SATW relates to student performance in college. Thus, admissions offices of many higher educational institutions have disregarded the SATW scores in their admission decisions. By examining how the SATW affects a number of college performance outcomes, this study fills the gap in the academic literature and also provides evidence for formulating admissions policies. This study uses data for over 4,300 first-year students at the University of Georgia who were in the first cohort of students to take the SATW and complete a year of higher education. These student-level data provide information about personal (e.g., race, gender, parental education) and high school characteristics (GPA, SATM and SATV scores, Advanced Placement courses, high school attended). The data also include every college class students took and their corresponding grades. Regressions that control for personal and high school characteristics indicate that with each 100-point increase in SATW scores, students earn, on average, 0.07-points higher first-year GPAs and 0.18-points higher GPAs in freshman English courses; they also enroll in and earn 0.44 and 0.54 more credit hours, respectively. Conversely, these students withdraw from 0.2 fewer credit hours and are 3% less likely to lose the HOPE Scholarship. In general, SATW scores better explain student performance than either the SATV or SATM scores.

Sequencing and Tissue Distribution of Toll-like Receptor 3 in White-tailed Deer

Seychelle M. Vos, CURO Scholar
Dr. Elizabeth Howerth, Department of
Pathology, University of Georgia

Hemorrhagic disease is a fatal disease in white-tailed deer (WTD) caused by two closely related orbiviruses, bluetongue virus and epizootic hemorrhagic disease virus. 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 intracellular 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 TLR3 on disease susceptibility can be evaluated. Therefore, the objectives of this study were to sequence 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 TLR3 mRNA in cattle. Primers were then designed specifically for deer using the newly sequenced fragment. Quantitative analysis of TLR3 mRNA in various WTD tissues from non-infected WTD is being performed using real time-polymerase chain reaction (qRT-PCR). Preliminary results suggest that the TLR3 is expressed in skin, small intestine, brain, lung, and spleen at levels that may prove useful in future research. These results will allow further investigation into the overall significance of the TLR3 in variation of susceptibility to disease among WTD populations.

Source Memory and Picture Location in Relation to Working Memory

Dana Wagshal, CURO Scholar
Dr. Nash Unsworth, Department of Psychology,
University of Georgia

Previous research has shown that picture location is related to source memory overall, and

is in fact a measure of source memory. Source memory is the process by which memories are attributed to the original context or source. Thus, university undergraduates will complete a computer task in which the participant must decide if the image on the screen is old or novel and if the image is old, he/she must indicate the original location of the image. Moreover, past studies have shown a relationship between attributing the location of a picture to source memory. However, while a relationship between source memory and picture location has been shown, the question addressed by this study is whether working memory and source memory, as measured by the picture location task, are related, and if so how? According to the traditionalist view, working memory is memory that has been manipulated. However, the manipulation of memory is only one component of working memory. Cues and active maintenance are also important components that compose working memory. Therefore, the relationship between source memory and picture location seems too simple; this project postulates that there is also a correlation between working memory and source memory. Thus, by measuring high and low span differences of undergraduates completing computer tasks of working memory, this research project is aimed at investigating the nature of the relationship between source memory and working memory and to further elucidate and examine their more detailed components in performance.

Is Elevation of O-GlcNAc Levels Both Necessary and Sufficient to Extend Median Lifespan?

Wei Wang

Dr. Lance Wells, Department of Biochemistry & Molecular Biology, University of Georgia
Sandra Brimble & Enas Gad El-Karim,
Department of Biochemistry & Molecular Biology, University of Georgia

From *C. elegans* to mice, reduced signaling through the insulin-like pathway extends both median and maximal lifespan. However, reduced signaling defined as insulin resistance also precedes and is the hallmark of type II diabetes.

The laboratory has demonstrated previously that elevation in intracellular glycosylation of nuclear and cytosolic proteins via O-GlcNAc (carbohydrate modification) induces insulin resistance. More recently, the laboratory has demonstrated that the O-GlcNAc cycling enzymes (OGT that adds and OGA that removes the O-GlcNAc modification) modulate median lifespan in *C. elegans* and thus are modulating the insulin-like signaling pathway in the nematode. Having demonstrated that elevation of O-GlcNAc levels is sufficient to increase lifespan, the project focuses on whether or not it is necessary. The project is focused on measuring O-GlcNAc levels and mRNA and protein expression levels of the cycling enzymes in mutant strains of *C. elegans* that have elongated or shortened median and/or maximal lifespans. Furthermore, given that an OGT null mutant can suppress long-lived insulin mutants' median lifespan without altering maximal lifespan is of great interest since no other repressive mutant only alters one of these two criteria. Thus, several mRNA preparations from multiple strains for microarray analysis will be generated in order to identify key regulated genes that may be involved in longevity versus median lifespan. In conclusion, the results expected are that greater O-GlcNAc levels are indeed needed for increased median lifespan and that the microarray experiments will direct us towards the genes involved specifically in longevity.

Design Evolution of a Non-Electric Evaporative-Cooling Milk Container for Smallholder Farmers in East Africa

Aaron O. Watwood

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

Smallholder dairy farmers of East Africa must cool their fresh milk to four degrees Celsius in four hours in order to meet ISO standards for marketability. Ugandan dairy farmers, in particular, are not able to market their evening milk due to lack of cooling facilities, and thus must forfeit the potential revenue gained from it.

Through a design and research undergraduate program, we are developing a cooler that is non-electric and works by an evaporative-cooling mechanism that relies on vacuum and zeolite adsorption. Three designs have evolved thus far with varying constructions and performances. The first design, consisting of a separate zeolite container and on-site generated vacuum via a hand pump, exhibited inadequate cooling (30 to 25 centigrade degrees). The second design, independently conceived and commercialized by CoolSystems of Germany as “CoolKeg” for alcoholic beverages, achieved the desired cooling kinetics but lacked several attributes to be applicable under smallholder operating environment. In collaboration with CoolSystems, modifications have been incorporated into the second design to be compatible with smallholder dairy farmer practice, with milk cooling performance and maintenance being the primary concerns. This third design is undergoing performance testing with respect to cooling kinetics. Details of the third design will be presented with emphasis on the changes made to make it work for the smallholder dairy farmer in Eastern Africa.

Black Women and the Movements: Using Art to Re-Define Beauty

Delila D. Wilburn, CURO Summer Fellow
Dr. Barbara McCaskill, Department of English,
University of Georgia

During the 1960s and the 1970s, the United States became the breeding ground for several organizations that sparked a series of social movements in favor of equal civil rights and liberties for minority groups. Breaking away from the strict political nature of other movements, the Black Arts Movement (BAM) emerged nationally from the African American community. BAM was a movement among black artists who valued art by and for black people, and who wanted to use art to help black people transform and improve their communities. The movement complied with the Black Vernacular Tradition, which encouraged African Americans to reject standard traditions, especially of cultural aesthetics, literary forms,

and expressive art. Using the biographical resources available and the published work of the artists, my research profiles notable women associated with BAM. The profiled artists are the singer Nina Simone (1933-2003), and the poet and professor of English at Virginia Tech Nikki Giovanni (1943-present). These women used their songs and poems respectively not only as sources of inspiration for black women, but as voices of activism for all women alike. Their work influenced the rise of second wave feminism, a period of feminist activity during the 1960s and the 1970s, with profound critical messages on gendered racial politics and women’s liberation. Their work—innovative and unconventional—display aesthetical messages that resonate as loudly as when they were first introduced to the American public: true beauty is defined not by compliance to traditional standards, but through non-conformity and originality.

Determining the Truth: The War on Terror and Repression in China

Ashley A. Wilkinson, Roosevelt @ UGA
Dr. David S. Williams, Honors Program,
University of Georgia

Both human rights organizations and governments have long accused China of oppressing its Muslim Uighur population, of whom many are separatists. Since the War on Terror began, their criticisms of the Chinese government for its perceived persecution of Uighurs have increased. However, it may be difficult to establish whether bias has somehow contributed to charges of intensified human rights abuses. To produce less biased assertions, an automated events data coder can be used to assert whether human rights violations have actually increased. In order to determine the accuracy of the claims that China has repressed the Uighurs more after the War on Terror began, both Chinese rhetoric and acts of Chinese repression as reported in newspapers were analyzed using an automated events data coder. For the rhetoric, the data coder was used to search newspapers for the words Chinese officials and media used to describe Uighur

separatists from 1994-2007. The same software program was used to look for words describing acts of repression, such as torture, execution, and re-education, also from 1994-2007. After comparing and analyzing the data before and after the War on Terror began, and controlling for variables such as economic change, change in leaders, and dissent, preliminary results suggested that the War on Terror correlated with the Chinese crackdown. This case shows that automated events data coding may potentially provide a more trustworthy account of whether human rights have been violated in a given state.

Ending the Waiting List Crisis: Increasing Child Care Subsidy Funds

Ashley A. Wilkinson, Roosevelt @ UGA
Dr. Thomas McNulty, Department of Sociology,
University of Georgia

Reliable child care enables parents to attain and maintain employment. In the past, the United States Congress recognized the importance of childcare, boosting subsidies for the service after the government increased work requirements during the 1996 restructuring of welfare. Today, the U.S. government encourages low-income families to get off welfare, but fails to adequately fund the child care subsidies these families need in order to work. Normally, the federal government provides states funds for child care subsidies through the Child Care Development Block Grant (CCDBG) and Temporary Aid for Needy Families (TANF). Unfortunately, since 2001, state budget deficits, inflation, and increased TANF work requirements have reduced the amount of money states receive to allocate for child care assistance. Because of this decrease in funding, seventeen states currently have waiting lists for child care subsidies, including Georgia. According to the federal government's inflation calculator, the United States must increase funds to the CCDBG by \$460 million to cover the decreased value of the CCDBG's stagnant funding. In addition, advocacy groups claim that \$3.8 billion must be spent to meet Congress's new work requirements for TANF, amounting to a combined total of \$4.26 billion to be spent

over the next five years. After reading articles and papers from the federal government, state governments, and advocacy groups, I have realized that while individual states are also responsible for child care subsidy waiting lists, the problems have begun at the federal level and should be resolved on that level first.

HIV/AIDS in India: A Case Study on the Influence of Traditional and Modern Indian Characteristics on the HIV/AIDS Epidemic among Indian Youth

Amy K. Winter
Dr. Nan McMurry, Department of History,
University of Georgia

India is a dynamic country currently experiencing rapid economic development and societal change as well as a dangerous HIV/AIDS epidemic that has infected 2.5 million people. In the transition from a traditional identity of social conservatism and poor economic status to a modern world of open markets, consumerism, and growing western influences, Indian youth are a vulnerable demographic, accounting for 31% of India's AIDS cases while constituting only 25% of the population. The objective of this paper was to explore how both traditional and modern influences have affected the spread of HIV/AIDS in Indian youth. Specifically, I explored five traditional and modern Indian characteristics. The traditional characteristics are gender inequality, lack of sex education, and poverty. The modern characteristics are migration, and sexual liberalism. These five characteristics are interrelated and none are direct causes of HIV/AIDS, however, these characteristics foster situations that place Indian youth in positions of higher vulnerability to contracting HIV/AIDS. Where HIV/AIDS infection and transmission are concerned, India is caught between the worst of a traditional/underdeveloped country and a modern/developed country. Indian youth are the unfortunate population who are the recipients of both traditional and modern characteristics that position them in an environment where they are highly vulnerable to contracting HIV/AIDS.

Regional Comparison of the Legal Basis of Venture Philanthropy

Karen C. Wong, CURO Summer Fellow, CURO Scholar

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

Venture philanthropy falls under social entrepreneurship and is the new trend in philanthropy. It is a social change investment vehicle and contains entrepreneurial activity in charitable organizations. It involves the application of corporate principles to nonprofits, long-term commitment, and high engagement. Venture philanthropists choose and assist certain non-profits with constructing and executing strategic plans that will lead to substantial growth and broad social impact. Venture philanthropists take a performance and results focused orientation. To achieve this aim, venture philanthropists incorporate fixed milestones and tangible return and exits into nonprofits. Venture philanthropists emphasize creating self-sustainability in a nonprofit. This research will examine the legal basis of venture philanthropy to better understand and analyze the motivation and characteristics of venture philanthropy groups. We hope to understand the legal formulation and governance of venture philanthropy groups in the United States. By studying the legal governance structure of venture philanthropy groups, we can better understand the structure and characteristics of venture philanthropy groups. After assessing basic legal agenda associated with venture philanthropy, the paper will conduct a study that compares the different legal foundations of venture philanthropy within different regions in the United States. We will analyze and compare the legal basis and governance of venture philanthropy groups cross-country to gain a diverse perspective.

Permeability of Intestinal Cells Exposed to Black Walnut Extract

Leilah D. Zahedi, CURO Apprentice
Dr. David Hurley, Department of Population Health, University of Georgia

Acute laminitis, a condition characterized by vascular dysfunction and inflammation in the hoof, occurs in horses that ingest or are exposed to shavings from Black Walnut trees. We hypothesize that a change in intestinal permeability, due to localized effects of an aqueous Black Walnut extract (BWE) play a role in the pathogenesis of laminitis. The increased permeability of the intestinal mucosa then allows movement of intestinal contents into the vascular system resulting in a systemic inflammatory response. Due to the design of the hoof, inflammation leads to a loss of perfusion, pain, and a potentially life threatening condition. To test our hypothesis, we measured changes in permeability of the tight junctions between human intestinal cells to fluorescent probes of various sizes. The cells were grown on filters separating two chambers, and incubated with BWE. We measured movement of these probes across the cells and compared those results with control samples. Preliminary results indicate low concentrations of BWE decreased tight junction permeability, but permeability increased as BWE concentrations increased. These results suggest that the amount of BWE ingested might be linked to whether leakage, and therefore inflammation occurs. Since the above experiments were conducted to establish methodology, conclusions on effects of BWE will be better determined when the protocols are conducted using equine intestinal cells. Those studies will give us a clearer picture of the effects of BWE on changes in intestinal permeability that could lead to laminitis.



Simulacrum Ring

Marilyn Zapf

Prof. Robert Jackson, Department of
Jewelry/Metalsmithing, University of Georgia

My current research explores the line between the real and the reproduction. Moulds are taken from specific areas of the body and reconfigured into a landscape questioning how an image is created, how true a copy is to its original, and at what point a reproduction leaves what it signifies and becomes a reality in and of itself. The work, used in a jewelry context, emphasizes both its dependence on and departure from the body. The ring format relies on the finger for its function while simultaneously hiding the finger from view. In “Simulacrum Ring,” moulds are taken from the knuckles of the hand, reconfigured, translated into silver, and returned to the body in its new orientation.

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