2011

East Carolina University

Creating a Better Tomorrow

5th Annual
Research & Creative Achievement Week

Mendenhall Student Center

April 4 – 8 2011

Research and Creative Achievement Week

April 4 – 8, 2011

Mendenhall Student Center

Research and Creative Achievement Week

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Letter from the Vice Chancellor

March 2011

Dear ECU Community:

The Division of Research and Graduate Studies invites you to participate in the **ECU Research and Creative Achievement Week** on the campus of East Carolina University. The week of **April 4-8, 2011**, has been set aside to highlight the extraordinary accomplishments of our students in research and creative activities. Because the number of events has increased, events will also be held the previous week. It is the hope of the organizing committee that you will attend, as much as your time allows, in order to see and hear what our students have achieved. In addition, we hope that you will provide strongly encourage your students to attend. The event is sponsored by a partnership of these entities: Division of Research & Graduate Studies, Division of Academic and Student Affairs, Doctoral Student Association, Graduate and Professional Student Senate, Office of Undergraduate Research, *Sigma Xi*, The Scientific Research Society and Graduate School.

The theme of the week's activities is "***Creating a Better Tomorrow***." The Research and Creative Achievement Week is a showcase of graduate and undergraduate student research and creative activities that are taking place here at ECU. There will be over 270 student presentations, an impressive number that reflects the current growth in research and creative activities at ECU in a variety of fields and disciplines. Oral presentations will take place on Monday, April 4 (Graduate Day) and Wednesday, April 6 (Undergraduate Day) with posters on display for an additional day each.

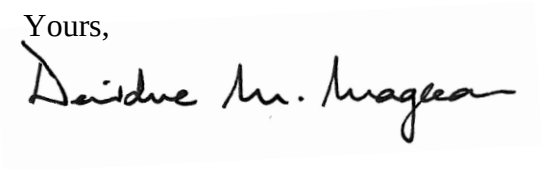
In addition to presentations by students, we also will be recognizing three of our own outstanding faculty for their research accomplishments through their individual research presentations and at an awards reception. Faculty inventors who are cited in U.S. patents issued in 2010 will also be recognized. As a kick-off event for the week, on March 29, the RENCI Visualization Challenge 2011 winner will be announced. The International Scholar Symposium will be held on April 6. The Scholar-Teacher Awards and Symposium at which nine faculty will be recognized for the integration of research into their teaching, as well as the College of Education Lecture Series and the *Sigma Xi* Lecture, will all be held on April 7. The whole week is capped off with the announcement of the student participant winners on Friday, April 8.

Please consider encouraging your classes to attend specific discipline-related oral student presentations on Monday and Wednesday (April 4 and 6) or to view the poster presentations Monday through Thursday.

Visit the RCAW blog at http://blog.ecu.edu/sites/rcaw2011/ for a schedule of events (click on Schedule of Events or Presentation Schedule).

What an exciting week and a great experience for our students. We look forward to seeing you at the Mendenhall Student Center and participating in these events.

Yours,



Deirdre M. Mageean, PhD

Vice Chancellor

2011 PROGRAM SPONSORS

The Division of Research and Graduate Studies

The Division of Academic Affairs

Division of Health Sciences

Graduate and Professional Student Senate

The Office of Undergraduate Research

Office of Student Affairs

Office of University Honors

Undergraduate Research/Creative Activities Committee

Doctoral Student Association Brody School of Medicine

Scientific Research Society of *Sigma Xi*

The Graduate School

Research and Creative Achievement Week Planning Committee

The RCAW Committee comprises of students, staff, and faculty. They are listed as follows:

Planning Committee:	
Tom McConnell: The Graduate School, Chair RCAW	**Melani Duffrin**: Nutrition and Dietetics, College of Human Ecology
Mary Farwell: Biology, Research and Graduate Studies, Co-Chair RCAW	**Jim Ellis**: Honors College
Abbie Brown: Mathematics, Science, and Instructional Technology Education, College of Education	**Nehad Elsawaf**: Economics, Thomas Harriot College of Arts and Sciences
Evelyn Brown: Engineering, College of Technology and Computer Science	**Rich Franklin**: Microbiology and Immunology, Brody School of Medicine
Vince Contreras: Research and Graduate Studies	**Elizabeth Hodge**: Business and Information Technologies Education, College of Education
Robin Croskery: Graduate student in History, Thomas Harriot College of Arts and Sciences	**Derrick Isler**: The Graduate School
Rich Curran: Graduate student in Geography, and President of Graduate and Professional Student Senate	**Keon Pettiway**: student, School of Art and Design
Christyn Dolbier: Psychology, Thomas Harriot College of Arts and Sciences	**Margaret Pio**: Division of Research and Graduate Studies
	Drew Rockett: Post-graduate student in Biochemistry, and President – Doctoral Student Association
	Amy Tripp: The Graduate School

Techincal Committee:	
Abbie Brown **Tony Cooke** **Wendy Creasey** **Laurie Godwin**	**Derrick Isler** **Matthew Powell** **Ginny Sconiers** **John Southworth**

Schedule of Events

MONDAY: 4 April – Graduate Student Day

Graduate Student Presentations

Oral: *Great Rooms 1, 2+3,* and *Room 15*

- 9:00am–noon
- 1:00pm–5:40pm

Posters: *Rooms 221 and 244*

- 9:00am–5:30pm

Lifetime Achievement Seminar: *Great Rooms 2 & 3*

- Noon–1:30pm
- Dr. William J. Meggs

TUESDAY: 5 April

Graduate Student Posters on display: *Mendenhall Rooms 221 and 244*

Science Crossroads: *East Carolina Heart Institute conference room, 1st floor*

- 11am–2pm

Five-Year Achievement Seminar: *Great Rooms 2+3*

- Noon–1:30pm
- Dr. T. Chris Riley-Tillman

Five Year Achievement Seminar: *Great Rooms 2+3*

- 6:30pm
- Dr. Jason E. Bond

WEDNESDAY: 6 April – Undergraduate Student Day

Undergraduate Presentations

Orals: *Great Room 1 and Room 244*

- 9am–12:20
- 1:40pm–5pm

Posters: *Rooms 221 and 15*

- 9am–5:00pm

Distinguished Faculty Luncheon (Invitation only): *Great Rooms 2+3*

- Noon–1:30pm
- ✓ Lifetime and 5-year Achievement Awards
- ✓ Inventors Recognition

International Scholar Symposium: *Great Rooms 2+3*

- 2:30pm–6pm

THURSDAY: 7 April

Undergraduate Student Posters on display: *Rooms 221 and 15*

- 9am–4pm

College of Education Lecture: *Room 244*

- 9:30am–11am

Teacher Scholar Symposium: *Great Rooms 1, 2+3 and Room 244*

- 12 noon–3:30pm

Sigma Xi Lecture: *Room 244*

- 4:00pm–6:00pm

FRIDAY: 8 April

Student Awards Luncheon (invitation only): *Great Rooms 1+2+3*

- Noon–1:30pm

✓ RCAW Awards
✓ URCA Awards
✓ Thesis/Dissertation Awards
✓ RENCI VISLAB Challenge Award

FACULTY RECOGNITION: RESEARCH AND CREATIVE ACTIVITY

LIFETIME
AND
FIVE-YEAR ACHIEVEMENT
AWARDS

AND

INVENTOR DISCOVERY

East Carolina University Achievement Award for Excellence in Research and Creative Activity

Recipients of the Achievement for Excellence in Research and Creative Activity Award are recognized for the originality and excellence of their research and creative activities, as evidenced by sustained high quality work performed at ECU. The recipient of the lifetime achievement award is recognized for accomplishments made across the entire span of his professional career, and recipients of the five year award are recognized for their achievements during five years of continuous service at ECU. Recipients were nominated by their peers in acknowledgement of their achievements. Awardees were selected by the vice chancellor for Research and Graduate Studies upon recommendation of the subcommittee of the Faculty Senate Academic Awards Committee.

Lifetime Achievement Award:

William Joel Meggs, Professor, Department of Emergency Medicine, Brody School of Medicine

Dr. Meggs received a BS in Physics from Clemson University, a PhD in Physics from Syracuse University, and an MD from University of Miami. After residency in internal medicine at Rochester General Hospital, Dr. Meegs was a medical staff fellow at the National Institute of Allergy and Infectious Diseases, NIH, and a fellow in medical toxicology at NYC Poison Center and Department of Emergency Medicine, Bellevue Hospital Center, NYU. He has spent research time in Europe and, in Canada, as a Professor. He is a member of numerous medical, toxicology, and immunology societies. He has received over two million dollars in grant funding and has published over 70 refereed articles, and has been exemplary in his professional service and teaching, to ECU and to the national medical community. He currently serves as Senior Vice Chair for Academic Affairs, Department of Emergency Medicine, Brody School of Medicine.

In the words of Dr. Kori Brewer, "Over the last three decades, Dr. William Joel Meggs has made contributions to medicine and science that have shown innovation and creativity in amazingly diverse areas of study. These range from new hypotheses on the nature of organization in biology to practical considerations as to the best way to preserve

life from potentially fatal snakebites. In his home Department of Emergency Medicine, faculty creative activities are evaluated based on productivity and impact of work on the field. Dr. Meggs has proven to be a leader in both of these arenas. It is because of this success, that we respectfully nominate Dr. Meggs for the Lifetime Research and Creative Activity Award."

Describing Dr. Meggs background, Dr. Perrone wrote "Because of his diverse background and training, he has authored numerous articles in the toxicology, immunology, physics, and the emergency medicine literature. It is the unique way that he has creatively managed to merge these disciplines in his teaching and research to become an expert in multiple chemical sensitivities. He has elucidated new pathways in the study of allergic asthma. He is a gifted teacher and embodies the role of mentor, colleague and friend to the many emergency physicians, researchers, and medical toxicologists he has taught and trained. Although I have known him for almost twenty years, his career now spans 40 years, and I have just a glimpse of his accomplishments."

Dr. Robert Hoffman adds "Since graduation, Bill has excelled in every aspect of Medicine. His research has furthered the understanding of many difficult concepts and produced papers that are well read and appreciated. Through these fine works and his participation in meetings he has gained international recognition as a teacher and researcher and stands as an example to so many of his colleagues. In summary, I can think of no one more deserving for recognition for a lifetime award for research and creativity. Bill's efforts to tackle meaningful issues with complex and novel modeling highlight a lifetime of wonderful achievement, by kind and caring physician."

Five –Year Achievement Awards:

Jason E. Bond, Professor, Department of Biology, Thomas Harriot College of Arts and Sciences

Dr. Jason Bond graduated from Western Carolina University with a B.S. in Biology in 1993. Shortly thereafter he began his graduate work at Virginia Polytechnic Institute and State University in spider systematics and evolution with Dr. Brent Opell. Upon completion of his M.S. thesis in 1995 he continued his graduate work at VA Tech to conduct research on trapdoor spider evolution, systematics, and taxonomy, receiving his Ph.D. in Evolutionary Systematics and Genetics in late fall of 1999.

Jason spent two years as a postdoctoral research associate at the Field Museum of Natural History in Chicago where he studied Caribbean millipede systematics and evolution. In 2001 he joined the Biology faculty at East Carolina University where he continues to work as a Professor of Biology and Director of the North Carolina Center for Biodiversity.

His research, supported by grants from the National Science Foundation, focuses on questions related to the pattern and process of evolutionary diversification in arachnids and myriapods. His lab group has worked to develop approaches to evaluating species boundaries that seek to integrate genetic, spatial, ecological, and phenotypic data. Dr. Bond's work has afforded him the opportunity to travel to all sorts of wonderful places in search of spiders and millipedes that include South Africa, Namibia, Australia, Malaysia, Guatemala, Costa Rica, Mexico, Jamaica, and Europe. Although having done his share of molecular lab work and large scale phylogenetic analyses, Jason still prefers his time sitting behind a really nice Leica dissecting microscope describing new spider species.

T. Chris Riley-Tillman, Associate Professor, Department of Psychology, Thomas Harriot College of Arts and Sciences

Dr. Riley-Tillman is an associate professor with the psychology department at East Carolina University and director of the PhD program in Pediatric School Psychology. Dr. Riley-Tillman received his PhD in School Psychology from Syracuse University. In his current position, he provides training in assessment, intervention and consultation. Furthermore, he brings qualifications in the areas of applied behavior analysis, behavioral assessment, academic assessment and intervention, and the development and validation of assessment and intervention methodologies which are empirically supported and feasible. Related to these interests, Dr. Riley-Tillman is currently a co-principal investigator on Project VIABLE. He has published books on using single case design in RTI models and on school-based behavior assessment, and his overall research line has resulted in over 65 articles and book chapters. He is currently serving as an associate editor for *School Psychology Forum*, and as a board member of *School Psychology Review, School Psychology Quarterly, Journal of Educational and Psychological Consultation* and the *Journal of Applied School Psychology*.

East Carolina University Inventor Recognition

George Sigounas
Patent # 7,803,408
Method of Treating Endothelial Injury
Issued 9/28/2010

Mike Rastatter
Joe Kalinowski
Andrew Stuart
Patent # 7,828,712
Methods & Devices for Treating
Non-Stuttering Pathologies Using
Frequency Altered Feedback
Issued 11/09/2010

Gregg Givens
Patent # 7,854,704
Systems, Methods and Products
for Diagnostic Hearing Assessments
Distributed Via the Use of a Computer Network
Issued 12/21/2010

LECTURES AND SYMPOSIA

RENCI Visualization Challenge

Students participated in the 4th Annual Visualization Challenge on March 29th and took an opportunity to work on the Renaissance Computing Institute at ECU Center for Castal Systems Informatics Vixualization Wall located in Brewster C202. Students were given a chance to stretch their skills and imaginations and demonstrate their prowess at analytical, artistic, or visualization were encouraged to enter.

Faculty judges evaluated entrants and will award the winners during ECU's Student Awards Luncheon on Friday April 8th.

College of Education: Invited Faculty Lecture

Mendenhall Student Center: Room 244

9:30-11:00am

The College of Education Research Committee is pleased to announce the presenters for the COE Fourth Annual Invited Faculty Lecture, to be held in conjunction with ECU's annual Research and Creative Activity Week:

Dr. Lane Mills

Dr. James McDowelle

Dr. William Rouse, Jr.

Department of Educational Leadership

Topic

A Meta-Analysis of Research on the Mediated Effects of Principal Leadership on Student Achievement

We invite you to support your COE colleagues and ECU's Research and Creative Activity Week by attending this lecture.

For more information, contact Katie Schwartz at 737--2305 (schwartzca@ecu.edu)

EAST CAROLINA UNIVERSITY

INTERNATIONAL SCHOLARS SYMPOSIUM

SPONSORED BY

INTERNATIONAL FACULTY AND STAFF COMMITTEE

IN ASSOCIATION WITH ECU RESEARCH AND CREATIVE ACHIEVEMENT WEEK 2011

Wednesday, April 6, 2011

2:30 PM-6:00PM, Mendenhall Student Center, Great Rooms 2+3

Purpose and Goal:

The purpose of the International Scholars Symposium is to advance ECU's mission of internationalization by fostering research amongst ECU faculty and scholars. The symposium will not only serve as a platform to provide visibility to international scholars, but non-international scholars can also benefit by showcasing their research that they conduct through international partnerships and collaborations.

PRESENTATION SCHEDULE

2:30 - 2:40

Setup and Opening Remarks:

Dr. Nehad Elsawaf : International Scholar Symposium chair and organizer.

Mrs. Rhonda Brown : Immigration Specialist Office of International Affairs

Session 1:

Session Chair- Dr. Nehad Elsawaf

2:45 - 3:00

Education program offered in a familiar setting: Approach to improve osteoporosis preventive behaviors in a minority population. Oyinlola T. Babatunde , Department of Nutrition Science, East Carolina University, Greenville, NC 27858 and Susan P. Himburg, Department of Dietetics & Nutrition, Robert Stempel School of Public Health, Florida International University, Miami, Florida 33199.

3:00-3:30 - Guest Speaker

Conservation as the Cornerstone for Lasting Economic Growth in Cuba, Daniel Whittle, Director of the Cuba Program, Environmental Defense Fund, Raleigh, NC 27607

3:35-3:50

A Computational Mechanics Model for the microneedle-skin Penetration Process. Ranjeet Agarwala, Department of Technology Systems, East Carolina University, Greenville, NC-27858

Dr. M. K. Ramasubramanian **,** Dept. of Mechanical & Aerospace Engineering , North Carolina State University, Raleigh, NC 27695-7910

3:55-4:10

Physicomimetics and Swarms: Predicting Odds of Success for Robotic Swarms *Operations.* Aleksey Kletsov, Department of Physics, East Carolina University, Greenville, NC, 27858
Anton Rebguns, Diana Spears, Richard Anderson-Sprecher, William Spears.

4:10PM-4:20 PM

BREAK

Session 2:

Session Chair Dr. Nehad Elsawaf

4:20-4:35

College choice factors that encourage international students to attend East Carolina University. William Mallett, Cheryl McFadden and Cathy Maahs-Fladung, East Carolina University, Greenville, North Carolina, 27858.

4:40-4:55

A Multi-National Course on Global Climate Change, Rosana Nieto Ferreira, Department of Geography, Andrew Herdman ,College of Business, Scott Curtis ,Department of Geography, Rosina Chia, Department of Psychology, Elmer Poe, College of Technology and Computer Science, Robert Thompson, Department of Political Science and Biwu Yang ,Emerging Academic Initiatives, East Carolina University, Greenville, NC, 27858

5:00-5:15

Implication of Cultural Diversity Debate for Women's Rights: The case of HIV/AIDS and Female genital Cutting. Mary Nyangweso Wangila, Religious Studies Program, East Carolina University, Greenville, NC 27858

5:20-5:35

Difference of Emergency Care Characteristics between Children and Adults, B.J. Kim, Department of Engineering and Dawn B. Kendrick, Department of Emergency Medicine, East Carolina University, Greenville, NC 27858

5:40- 5:55

Variation among populations in host responses to conspecific brood parasitism: how moorhens helped me see the world, Susan B. McRae, Dept. of Biology, East Carolina University, Greenville, NC, 27858

5:55- 6:00

Concluding remarks

ECU Chapter of the Society of Sigma Xi

Guest Lecture

Merging the Disparate Disciplines of Education and Engineering

Dr. Hayden Griffin

Mendenhall Room 244

Social and seminar presentation

4-6 PM

ECU Scholar-Teacher Awards and Symposium

Thursday, April 7, 2011
Mendenhall Student Center

2010-2011
Scholar-Teacher Awards and Symposium

Celebrating the Synergy between Scholarship and Teaching

Sponsored by
The Office of the Provost and Senior Vice Chancellor for Academic and Student Affairs

Mendenhall Great Rooms 2+3

12:00 -1:15 pm	Awards Presentation and Reception for Recipients and Invited Guests
12:00 – 3:30 pm	Poster Display – Mendenhall Great Rooms

Mendenhall Great Room 1 and Mendenhall 244

1:30 – 3:15 p.m. Faculty, Staff, Students, and the Community are invited to attend the Scholar-Teacher Symposium concurrent sessions in Great Room 1 and 244

Mendenhall Great Room 1

1:30 - **Dr. Jami L. Jones** – *Assistant Professor, Department of Library Science, College of Education*
Presentation Title: "Scholarship and Teaching as a Singular Creative Enterprise: My Story"

1:50 - **Dr. John W. Howard III** – *Associate Professor, School of Communication, College of Fine Arts and Communication*

Presentation Title: "Communication Pedagogy, Mentorship, and Scholarship: Being the Change I Wish to See"

2:10 - **Dr. Carmel Parker White,** *Assistant Professor, Department of Child Development and Family Relations, College of Human Ecology*
Presentation Title: "Teaching Undergraduate Students about the Research Process One Step at a Time"

2:30 - **Dr. Sloane C. Burke,** *Assistant Professor, Department of Health Education and Promotion, College of Health and Human Performance*
Presentation Title: "Engaging Others in Engaged Research"

2:50 - **Dr. Elaine S. Scott,** *Associate Professor, Department of Graduate Nursing Science, College of Nursing*
Presentation Title: "The Scholarship of Leadership."

Mendenhall 244

1:30 - **Dr. Jianchu (Jason) Yao,** *Assistant Professor, Department of Engineering, College of Technology and Computer Science*
Presentation Title: **"**Integration of Research and Teaching: A Two- Way Conduit"

1:50 - **Dr. Ravi Paul,** *Associate Professor, Department of Management Information Systems, College of Business*
Presentation Title: "Research, Creative Activity and Teaching: Overlapping, Synergistic and Effective in Preparing 21st Century Business Professionals"

2:10 - **Dr. Roger A. Rulifson,** *Professor, Department of Biology, Thomas Harriot College of Arts and Sciences and Senior Scientist, Institute for Coastal Science and Policy*
Presentation Title: "Educating Students by Experience and Adventure"

2:30 - **Dr. Thomas W. Crawford,** *Associate Professor, Department of Geography, Thomas Harriot College of Arts and Sciences*
Presentation Title: "Why I Love Maps, or Mappa Rasa"

Individuals with disabilities who require accommodation under ADA should contact the Department of Disability Support Services at (252) 737-1016 (voice/TTY) or dssdept@ecu.edu forty-eight hours prior to the start of the program.

A celebration of scholarship and teaching at East Carolina University
Sponsored by the Division of Academic Affairs

PRESENTATION OF AWARDS

2010-2011 Undergraduate Research and Creative Activity Awards

Fall 2010 Awards

Student Awardee		**Major**	**Mentor**	**Department/College**
Brittany	Carr	Biology & Chemistry	Pekala	Molecular Biol and Biochemistry, BSOM
Meagan	Decker	Chemistry	Morehead	Chemistry, HCAS
Jeffrey E	Dwulet	Biology and Chemistry	Spuches	Chemistry, HCAS
Kylie	Gearhart	Nutrition and Dietetics	M. Wheeler	Nutrition and Dietetics, CHE
Amandeep	Gujral	Biology and Chemistry	Schrenk	Biology, HCAS
Ashley	Hendrick	Media Production & Anthropology	Wyatt	Media Production, CFAC
Dare	Imes	Biology and Psychology	Verbanac	Surgery, BSOM
Samantha	Lehman	Health Fitness Specialist	DuBose	Exercise and Sports Science, CHHP
Wayne	Rummings	Biology and Chemistry	Christensen	Biology, HCAS
Kelli	Shortt	Biology and English	Scemama	Biology, HCAS
Jessica	Snyder	Biology	Kimmel	Biology, HCAS
Lynette	Spencer	Nutrition and Dietetics	Wall-Bassett	Nutrition and Dietetics, CHE
Caitlin	Trumbo	Biochemistry and Chemistry	Sperry	Anatomy and Cell Biology, BSOM
Stacy L	West	Nutrition and Dietetics	Wall-Bassett	Nutrition and Dietetics, CHE

Spring 2011 Awards

Student Awardee		**Major**	**Mentor**	**Department/College**
Brianna	Biscardi	Chemistry and Neuroscience	A. Kennedy	Chemistry, HCAS
Robert	Broda	Geology	Leorri	Geological Sciences, HCAS
Stephen	Canady	Biochemistry and Chemistry	Hvastkovs	Chemistry, HCAS
Charles	Carter	Health Education & Promotion	Burke	Health Education & Promotion, CHHP
John	Creech	Biology and Chemistry	DeWitt	Pharmacology & Toxicology, BSOM
Caitlin	Gold	Biology	Scemama	Biology, HCAS
Danielle	Jessen	Biology and Chemistry	W. Allen	Chemistry, HCAS
Kelley	Johnson	Health Education & Promotion	Hines	Nutrition and Dietetics, CHE
Lena	Keller	Biology	Christensen	Biology, HCAS
Jonathan	Lee	Neuroscience Studies	Lu	Anatomy and Cell Biology, BSOM
Tiffany	Lee	Neuroscience Studies & Biology	Bareiss	Physical Therapy, CAHS
LaDonna	Maddy	Nutrition and Dietetics	Wall-Bassett	Exercise and Sports Science, CHHP
Sherri	Moore	Nutrition and Dietetics	M. Wheeler	Nutrition and Dietetics, CHE
Wesley	Owens	Art	Herron	English, HCAS
Cristian	Potter	Mathematics	Liu/Elsawaf	Economics, HCAS
Eden	Rouse	Neuroscience Studies	Warner	Psychology, HCAS

Melissa	Sayre	Hospitality Management	Chandler	Hospitality Management, CHE
Rachel	Steeb	Nursing	Larson	Nursing, CON
Kimberly	Tillapaugh	Chemistry and Biochemistry	A. Kennedy	Chemistry, HCAS
Kimberly	Wade	Biology	McRae	Biology, HCAS
Joshua	Wheeler	Engineering	Abdel-Salam	Engineering, TECS

2011 Research and Creative Achievement Week Judges

Faculty

David Brown	Physiology	**Ian Hines**	Nutrition and Dietetics
Joe Chalovich	Biochemistry	**Mike Wheeler**	Nutrition and Dietetics
Jian Dean	Physiology	**Beth Wall Bassett**	Nutrition and Dietetics
Rich Franklin	Microbiology & Immunology	**Carmel White**	Child Development and Family Relations
Brett Kieper	Biochemistry	**Jennifer Hodgson**	Marriage and Family Therapy
Isabelle Lemasson	Microbiology & Immunology	**Kerry Littlewood**	Social Work
Barbara Muller-Borer	Cardiovascular Sciences	**Tracy Carpenter-Aeby**	Social Work
Nick Polakowski	Microbiology & Immunology	**Joe Luczkovich**	Biology
Marty Roop	Microbiology & Immunology	**Carol Goodwillie**	Biology
Rachel Roper	Microbiology & Immunology	**JP Walsh**	Geological Sciences
Ann Sperry	Anatomy and Cell Biology	**Sergiy Vikomer**	Computer Science
Jane Thomassen	Surgery	**Anne Spuches**	Chemistry
David Tulis	Physiology	**Anthony Kennedy**	Chemistry
Jitka Virag	Physiology	**Ricky Castles**	Engineering
Yong Zhu	Biology	**Paul Kauffman**	Engineering
Cindy Putnam-Evans	Harriot College of Arts and Sciences	**Jerry Micklow**	Engineering
		Luc Carr	Exercise & Sport Science
Jennifer Bowler	Psychology		
Mark Bowler	Psychology		
Steven Schmidt	Education		
Paul Hager	Biology		

Hayden Griffin	Engineering
Paul DeVita	Exercise & Sport Science
Shaquria Adderley	Physiology
Te-Shun Chou	Technology
Beth Velde	Social Sciences
Cliff Ruehl	Biology
Mike McCammon	Exercise & Sport Science
Lisa Campbell	Psychology
Jinling Huang	Biology
John Placer	Computer Science
Karl Abrahamson	Computer Science
Jeannie Golden	Psychology
Chad Bosetti	Engineering
Donna Kain	English
William Forsythe	Nutrition
Marie Gallagher	CHE
Al Schreier	RGS
Ernie Marshburn	RGS
Paul Gemperline	Graduate School
Tom McConnell	Graduate School

Graduate Students

Alena Nakonechnaya
Ben McGlaughon
Chad Hunter
Brittany Beck
Celestine Davis
Taylor Rush
Misty Joyner
Drew Rockett
June Preast
Sara McLeod
Trey Sloan
Di Wu
Chad Frasier
William Chappell
Zhe Lu

ORAL AND POSTER PRESENTATIONS:

Mentor Listing

And

Presenter Schedule by Index Number

Mentor Listing

Abdel Abdel-Rahman
Alan Pope
Alan Taylor
Alex Manda
Alexander Murashov
Alexandros Georgakilas
Alice Anderson
Alleah Crawford
Allison Danell
Amy M. Friesland
Andrew Morehead
Andringa Kim
Angela Lamson
Angela Thompson
Ann Sperry
Anthony Kennedy
Anthony Kulas
Anthony Overton
Archana Hegde
Baohong Zhang
Barbara Muller-Borer
Beth Easterling
Beth Thompson
Bonnie Bolkan
Brett Keiper
Brian Shewchuk
Bryce Jorgensen
Carmel White
Carol Goodwillie
Carol Jenkins
Carol Kline
Chad Stephens
Charles Smith
Christopher Wingard
Christyn Dolbier
Claudia Jolls
Connie Renz
Craig Landry
Damon Rappleyea
Darlene Jesse
David Brown
David Chalcraft
David Cistola
David Harrawood
David Kimmel
David Knox
David Musick
David Tulis
Derek Alderman
Donna Kain
Dorsey Williams
Elizabeth Swaggerty
Elizabeth Wall-Bassett
Emily Steinbaugh
Ethan Anderson
Eugene Dixon
Everett Pesci
Frank Crawley
George Wang
Ginger Woodard

Heather Littleton
Heather Ramsdell
Heather Vance Chalcraft
Helena Feder
Hunt McKinnon
Hunter Copeland
Isabelle Lemasson
Jacques Robidoux
James Chandler
James McCubrey
Jamie DeWitt
Jason Bond
Jean Golden
Jean-Luc Scemama
Jeffrey McKinnon
Jelena Bogdanovic
Jennifer Hodgson
Jianchu Yao
Jiao Zhang
Jimmy Linn
Jitka Virag
John Kenney
John Reis
John Stiller
John Tucker
John Walsh
Joseph Fridgen
Joseph Houmard
Joseph Luczkovich
Julien Billeter
Kathryn Verbanac
Kimberly Heidal
Kindal Shores
Kirk St Amant
Krishnan Gopalakrishnan
Laura Edwards
Leonard Palmer
Leslie Lutes
Li Yang
Lisa Baranik
Lisa Campbell
Lisa Clough
Margit Schmidt
Maria Clay
Marianna Walker
Mark Mannie
Martha Baker
Mary Farwell
Mary Thomassen
Matt Schrenk
Matthew Schrenk
MD Motaleb
Megan Perry
Melani Duffrin
Michael McCammon
Michael O'Driscoll
Michael Van Scott
Michael Wheeler
Michele Pierotti
Moha Nassehzadeh-Tabrizi
Monte Miller
Nathan Richards
Orville Day
Paige Schneider
Patrice Morris
Patricia Anderson

Patrick Rider

Paul DeVita

Paul Gemperline

Paul Kauffmann

Punam Madhok

Purvis Bedenbaugh

Qun Lu

Rachel Roper

Rebecca Sweet

Richard Williams

Robert Chin

Robert Hickner

Robert Lust

Roger Rulifson

Ronald Cortright

Roy Roop

Rukiyah Van Dross

Saame Shaikh

Samuel Sears

Sarah Colby

Sarah E. James

Sergiy Vilkomir

Sharilyn Steadman

Sharon Ballard

Sharon Knight

Sherri Jones

Shouquan Huo

Siddhartha Mitra

Sonja Bareiss

Stefan Clemens

Stephanie Sullivan

Susan Leach

Susan McRae

Sylvia Brown

Tamara Warner

Terry Jones

Thomas Pauley

Tibor Hortobagyi

Timothy Christensen

Timothy Gavin

Timothy Jones

Timothy Romack

Todd Fraley

Tom Fink

Tracy Carpenter-Aeby

Tuan Tran

Venkatakrishnan Lakshminarasimhan

Victor Aeby

Walter Jenkins

Warren Knudson

Wayne Powell

Wendy Sharer

William Howard

Xiaoping Pan

Xin-Hua Hu

Yan-Hua Chen

Yu Yang

Monday, April 4, 2011 – Graduate Oral

Great Room 1

Natural Sciences – Graduate (9:00am – 11:40am)

9:00-9:20	O1	**Always a Bigger Fish - The influence of size and habitat on the feeding habits of spiny dogfish (Squalus acanthias) in North Carolina waters**, Charles Bangley
9:20-9:40	O2	**Distribution Patterns of Juvenile Spotted Seatrout (Cynoscion nebulosus) and Red Drum (Sciaenops ocellatus) in relation to habitats along Pamlico Sound, North Carolina**, Joey Powers, Anthony Overton, Wayne Mabe
9:40-10:00	O3	**Surfactant Assisted Electrospray Ionization Time of Flight Mass Spectrometry of Synthetic Polymers,** Christopher Williams
10:00-10:20	O4	**Kinetic modeling of dissolution of salicylic acid with in situ ATR UV-vis spectroscopy**, Chun Hsieh, Julien Billeter, Mary Ellen P. McNally, Ron M. Huffman, Paul J. Gemperline
10:40-11:00	O5	**Spatial and Temporal Changes in the Biogeography of Fishes along Intertidal Sandflats in Pamlico Sound, North Carolina**, Michael Mabe, Anthony Overton, Joey Powers
11:00-11:20	O6	**Asymmetric development of the female reproductive tract in elasmobranchs: a comparative-analysis of modes of reproduction and life history traits**, Lyndell Bade
11:20-11:40	O7	**Surface and groundwater quality in the Alligator River estuarine system, North Carolina,** Angela Giuliano, Alex Manda

Biomedical Sciences – Graduate (2:00pm – 5:00pm)

2:00-2:20	O15	**C. elegans oocytes cleave the protein synthesis factor eIF4G during germ cell apoptosis.** Andrew Friday
2:20-2:40	O16	**Efficient utilization of heme as an iron source in Brucella abortus requires the heme oxygenase, BhuO**, Jenifer Ojeda
2:40-3:00	O17	**Alternative mRNA forms for CED-4/Apaf-1 during apoptosis**, J. Kaitlin Morrison, Vince Contreras, Enhui Hao, Brett D. Keiper

3:00-3:20	O18	**The gene encoding the outer membrane heme transporter BhuA is regulated at the post-transcriptional level by the RNA chaperone Hfq in Brucella abortus 2308**, David Martinson
3:40-4:00	O19	**Effects of electroporation assisted Photofrin mediated Photodynamic therapy**, David Huffman
4:00-4:20	O20	**Injury-regulated microRNAs 744 and 431 promote regenerative axon growth following sciatic nerve crush in mice**, Di Wu, Elena Pak
4:20-4:40	O21	**Mechanism of Pit-1-Dependent Growth Hormone Locus Control Region Activity**, Tamra Hunsaker, Brian Shewchuk
4:40-5:00	O22	**Using Modulation Transfer Function for Characterizing Imaging Systems**, Wenhuan Jiang

Great Room 2+3

Natural Sciences – Graduate (9:00am – 11:40am)

9:00-9:20	O8	**Prey risk assessment and antipredator behavioral choices in larval anurans**, Molly Albecker, Heather Vance-Chalcraft
9:20-9:40	O9	**The Influence of Leaf Litter Type on the Biodiversity of Temporary Ponds**, Robert Deans, David R. Chalcraft
9:40-10:00	O10	**Trapped Photon Wavefunctions Near a Black Hole**, Davidson Wicker, Orville Day, David Pravica
10:00-10:20	O11	**Occurrence of changes in spiny dogfish male:female ratio in longline surveys in the Cape Cod area: management aspects**, Andrea Dell'apa, Jennifer Cudney-Burch, Roger Rulifson
10:40-11:00	O12	**Solvent-Controlled Switch of Selectivity between sp2 and sp3 C-H Bond Activation by Platinum (II),** Dileep Atchyut Vezzu, Alex W Garner, Caleb F Harris, Robert D Pike
11:00-11:20	O13	**Use of otolith microchemistry as a method for inferring natal origins and migrations of adult river herring**, Daniel Zapf

11:20-11:40	O14	**Phylogeny of the Ecdysozoa inferred from all 13 complete mitochondrial protein sequences with emphasis on the arthropod superclass Myriapoda,** Michael Brewer, Jason Bond

Biomedical Sciences – Graduate (2:00pm – 5:00pm)

2:00-2:20	O23	**Neutrophil Gelatinase-Associated Lipocalin - A Potential Role in Prostate Cancer Development and Progression**, William Chappell
2:20-2:40	O24	**Suppression of claudin-7 expression promotes cell proliferation and disrupts cell-matrix interactions in human lung cancer cells**, Zhe Lu, Yan-Hua Chen
2:40-3:00	O25	**Effects of Ketorolac (NSAID) on Vestibular and Auditory Evoked Potentials**, Gary Gaines, Timothy Jones
3:00-3:20	O26	**A Putative Lrp/AsnC Transcriptional Regulator Directly Controls the Kynurenine Pathway in P. aeruginosa**, Claire Knoten, L. Lynn Hudson, James P. Coleman, John M Farrow III
3:40-4:00	O27	**Biomechanical Correlates Of Walking Velocity in Young Adults**, Alexis Sidiropoulos, Patrick Rider, Aubrey Taylor, Steve Roseno, Tibor Hortobagyi, Paul DeVita
4:00-4:20	O28	**Linear and rotational baseball batting and effects on bat velocity**, James Metzinger, Paul DeVita, Michael McNally,Tibor Hortobagyi, Patrick Rider
4:20-4:40	O29	**Translation Initiation Factor eIF4G-1 Function during Apoptosis in Breast Cancer Cells**, Whitney Crosson, Amber Blackwell
4:40-5:00	O30	**Comparing and contrasting the effects of exogenous and endogenous growth hormone on LNCaP prostate cancer cell function**. Alena Nakonechnaya, Holly Jefferson

MSC Room 15

Technology & Computer Sciences – Graduate (9:00am – 10:40am)

9:00-9:20	O31	**Framework for the Verification of Google App Engine,** William Jenkins, Puneet Sharma

9:20-9:40	O32	**Process-based Software Defect Taxonomy**, Ali Asghary Karahroudy
9:40-10:00		**BREAK**
10:00-10:20	O34	**Predicting Software Faults**, Aravind Alluri, V. Lakshmi Narasimhan and S. Ramasamy
10:20-10:40	O35	**Virtual Classroom**, Sahar Bazargani, Troy West

Education – Graduate (10:40am – 11:40am)

10:40-11:00	O36	**The Journey of a Lifetime,** Thea Johnson
11:00-11:20	O37	**Trade Books in Elementary Education: Misconceptions in Science,** Heather Wiles
11:20-11:40	O38	**A Proposal to use Concept Maps and Vee Diagrams to Improve Learning in a Lecture-Lab Microbiology Course,** Maurice Smith

Social Sciences – Graduate (11:40am – noon and 1:00pm – 4:40pm)

11:40-12:00	O39	**Collaborating with stakeholders to develop surveys measuring the impacts of tourism and second home development in coastal communities**, Whitney Knollenberg, Joseph Fridgen, Pat Long, Huili Hao
1:00-1:20	O40	**Community Hazard Mitigation: An Empirical Analysis of North Carolina Counties**, Jingyuan Li
1:20-2:00		**BREAK**
2:00-2:20	O43	**Using the ABCD Model for Asset Building and Community Development for Dropout Prevention in the Ayden School Community**. Victoria Aeby, Richelle Smallwood, Monte Miller
2:20-2:40	O44	**The GATS and ECU: Globalization Hits Home**. Therese Pennell
2:40-3:00	O45	**Physical Activity and Greenway Usage among Proximate and Non-Proximate Residents**, Chip Davis

3:00-3:20	O46	**Evaluating Group Climate and Interaction in an Intern Task Group**, Melissa Valentine-Barrow, Tracy Carpenter-Aeby, Victor Aeby, Jaqueline Coleman-Carmon, Tori Aeby
3:20-3:40	O47	**The impact of humor, distraction, and trait forgiveness on rumination regarding a past transgression**, Julia Fondren, Doris G. Bazzini, Heather Littleton
3:40-4:00	O48	**Women's Gender Schemas for OB-GYNs**, Katherine Buck
4:00-4:20	O49	**"Way to Go!": The Effects of Tutoring on At-Risk Middle Schoolers**, Albee Ongsuco,
4:20-4:40	O73	**Death of a Gangster: Nothing left but the violence**, Christopher Stansbury

Humanities – Graduate (4:40pm – 5:40pm)

4:40-5:00	O50	**Web Design & Global Advocacy: Information design for international audiences to implement social change**, Joseph Dawson
5:00-5:20	O51	**An analysis of the social and cultural dynamics of women's alternative naming use**, Myleah Kerns
5:20-5:40	O52	**Micro-writing , Critical Thinking, and the First-Year Student**, Celestine Davis

Monday, April 4, 2011 – Graduate Poster

MSC Room 221

*Biomedical Sciences (9:00am – 12:00pm **and** 1:00 – 5:30pm)*

9:00-10:30	P1	**HTLV-1 Viral Protein HBZ Inhibits Histone Acetyltransferase Activity of the Cellular Coactivators p300/CBP**, Diana Wright
9:00-10:30	P2	**MULTIPLEX PROFILING DEMONSTRATES THAT CIRCULATING ADIPOKINES ARE RELATED TO INSULIN SENSITIVITY BUT NOT BMI**, Joseph R. Pierce, Raymond M. Kraus, Joseph A. Houmard, William E. Kraus, Charles J. Tanner, Myung Dong Choi, Robert C. Hickner
9:00-10:30	P3	**Bioengineering cartilage to study anabolic and catabolic metabolism of genetically modified cells.** Ben Danielson
9:00-10:30	P4	**Characterization of DNA Polymerase Delta (´) using a combined in vivo and in vitro strategy**, Chad Hunter, Lena Keller
9:00-10:30	P5	**Ethanol Attenuation of Peripheral NMDAR-mediated Pressor Response,** Marie McGee, Abdel Abdel-Rahman
9:00-10:30	P6	**Real-time reactive oxygen species (ROS) measurements in isolated human subcutaneous adipose tissue preadipocytes**, Artie Rogers, Jacques Robidoux
9:00-10:30	P7	**Altered Vascular Reactivity Following Exposure to Multi-Walled Carbon Nanotubes Increases Risk for Cardiac Injury**, Leslie Thompson, Chad R. Frasier, Ruben C. Sloan, Erin E. Mann, Ben Harrison, David A. Brown, Jared M. Brown, Christopher J. Wingard
9:00-10:30	P8	**Living with and Amongst HIV/AIDS in Ethiopia: Individual Spirituality and the Response of the Religious Community**, Ashley Mabina, Nicole Jacobs
9:30-11:00	P9	**The Impact of Hygiene-Related Skin Problems in Burma (Myanmar),** Kay Khine, Maria Clay
9:30-11:00	P10	**AMP kinase/PK-A crosstalk in vascular smooth muscle**, Joshua Stone, Avinash Narine

9:30-11:00	P11	**Initial Characterization of Programmed Cell Death in Pseudomonas aeruginosa**, Kyle Tipton
9:30-11:00	P12	**Parallel Increases In Energy Expenditure And Muscle Activation While Performing Clerical Work In Three Body Postures,** Caitlin Pearl, Patrick Rider, Paul DeVita, Tibor Hortobagyi, Olivia Ratcliff, Jennifer Streeter
9:30-11:00	P13	**Effect Of Repeated Unilateral Eccentric And Concentric Exercise On Spinal Excitability In The Contralateral Homologous Plantarflexors**, Ryan Hill, Binal Motawar, Mike McNally, Patrick Rider, Paul DeVita , Tibor Hortobágyi
9:30-11:00	P14	**Coactivation of Antagonist Hamstring Muscles During Maximal Effort Knee Extension**, Robert Brady, Tessa Cook, Paul DeVita, Patrick Rider, Tibor Hortobágyi
9:30-11:00	P15	**Introduction of a Visuomotor Task to Standard Weight Training: A Laboratory Demonstration of a New Model of Resistance Training in Humans**, Jeffery Morgan, Stanislaw Solnik, Steve Wiggins, Bill Churchwell, Patrick Rider, Paul DeVita, Tibor Hortobágyi
9:30-11:00	P16	**N-3 polyunsaturated fatty acids primarily affect lipid rafts in vivo** Benjamin Rockett., Heather Teague, Saame Shaikh, Andrew Franklin, Mitchel Harris
10:30-12:00	P17	**A possible role of the spinal autonomic system in the dopaminergic modulation of the monosynaptic stretch reflex**, Tracy Johnson
10:30-12:00	P18	**Characterizing the role of Psf2 in maintaining genomic integrity,** Jeffrey Chmielewski, Laura Henderson
10:30-12:00	P19	**Morphological Correlates of Gravity Receptor Functional Aging in CBA/CaJ Mice**, Jessica Pierce, Sarath Vijayakumar, Sherri M. Jones
10:30-12:00	P20	**Tumor necrosis factor-± induces immediate onset of mitochondrial dysfunction in HL-1 cardiomyocytes and human heart tissue**, Taylor Mattox, Alan Kypson, Evelio Rodregiuez ,Ethan Anderson, Kathleen Thayne
10:30-12:00	P21	**Whole body fat oxidation is not tightly coupled to subcutaneous abdominal adipose lipolytic rate over 24 hours**. Kathleen Gavin, Wendolyn Gozansky, Kazunori Ohkawara, Audrey Bergouignan, Robert C. Hickner, Edward L. Melanson

10:30-12:00	P22	**Oxygen Induced Resistance to Tert-butyl Hydroperoxide in Bacteroides fragilis**, Michael Betteken, C.J. Smith
10:30-12:00	P23	**Chronic MOG-Induced Atypical EAE in the Lewis Rat: A Novel Encephalitogen and A New Model for Neurodegenerative Disease**, Alan Curtis, Derek Abbott, Ashtom Thomasson
1:00-2:30	P24	**Ten Days of Exercise Improves Skeletal Muscle Lipid Oxidation Response to a 3-Day High-Fat Diet in Obese Individuals**, Gina Battaglia
1:00-2:30	P25	**Investigation of the Interaction between TLRR and Protein Phosphatase 1 Isoforms**, Nicole Devaul, Ann Sperry, Rong Wang
1:00-2:30	P26	**Drosophila Mcm10: One protein implicated in multiple cellular processes**, Michael Reubens
1:00-2:30	P27	**Novel Anti-Cancer Activity of Cucurbitacin IIa Through STAT3/JAK2-independent, Survivin and PARP-Mediated Apoptosis and Disruption of Actin**, Christi Boykin, RW Zhang, WM Yang, Qun Lu, Gen Zhang, Yan-Hua Chen
1:00-2:30	P28	**HOX Expression in Exponentially Growing and Differentiated Colon Cancer Cell Line HT-29**, Justin Castellow, Lucy Conaty
1:00-2:30	P29	**LasR interacts with the pqsR promoter region in Pseudomonas aeruginosa**. John Farrow, Matthew Ellison, Everett Pesci
1:00-2:30	P30	**Total Protein Concentration in Blood Serum as Determined by Benchtop Time-Domain NMR,** Michelle Robinson
1:00-2:30	P31	**Duodenal-jejunal bypass surgery improves glucose homeostasis but does not decrease skeletal muscle inflammation in female ZDF rats.** MA Reed, RD McKernie, RC Sloan, III, EZ Lukosius, JR Pender, V Boghossian, JJ Carter, K Parikh, JW Price, EB Tapscott, M Dar, WJ Pories, GL Dohm, and TP Gavin
2:30-4:00	P32	**Systematic Study of CD Spectroscopy Data Collection Technique Using Signal-to-Noise Ratio,** Julie DiNitto
2:30-4:00	P33	**TPA-Mediated COX-2 Signaling is Blocked by Apigenin in the**

Mouse Epidermis, Alex Kiraly

2:30-4:00	P34	**N-3 Polyunsaturated Fatty Acids as Regulators of Antigen Presentation**, Heather Teague, Saame Raz Shaikh, Benjamin Rockett, Mitch Harris
2:30-4:00	P35	**Inhibiting mitochondrial uncoupling protein 2 exacerbates myocardial ischemia/reperfusion injury**, Fatiha Moukdar, David A. Brown, Robert M. Lust, Reuben C. Sloan, Chad R. Frasier
2:30-4:00	P36	**Effectiveness of the C57BL/6 mouse strain within a chronic model of asthma**, Stefanie Burleson, Michael Van Scott,Dianne Walters
2:30-4:00	P37	**Decreases in reperfusion arrhythmias following ten days of exercise is not associated with improved mitochondrial calcium retention capacity**, Chad Frasier, Fatiha Moukdar, Robert Lust, David Brown, Ruben Sloan
2:30-4:00	P38	**Muscle Force Sensitivity to Muscle Model Parameters during Single-Leg Squatting**, John Pope, Tibor Hortobagyi, Anthony Kulas, Paul DeVita
2:30-4:00	P39	**ESTABLISHING LINKAGE BETWEEN GINS COMPLEX SUB-UNIT Sld5 AND CHECKPOINT PROTEIN chk2 USING DROSOPHILA MELANOGASTER AS MODEL ORGANISM**, Divya Devadasan
4:00-5:30	P40	**Mur regulates the gene encoding the manganese transporter MntH in Brucella abortus 2308**, Evan Menscher, Clay Caswell, Eric Anderson, R. M. Roop
4:00-5:30	P41	**Effects of Nicotine on Caenorhabditis elegans - Development of Invertebrate Animal Model for Drug of Abuse**, Michael Smith, Yanqiong Zhang, Baohong Zhang, Xiaoping Pan
4:00-5:30	P42	**Modified Vaccinia Ankara as an Oncolytic virus and its use in Pancreatic Cancer**, Andrew Freistaedter, Rachel Roper,Gwendolyn Jones,Emmanuel Zervos
4:00-5:30	P43	**Assessment of perfluorooctanoic acid (PFOA)-induced developmental cardiotoxicity**, Qixiao Jiang, Robert Lust,Jamie DeWitt

4:00-5:30	P44	**Blocking mitochondrial permeability transition pore opening attenuates ischemia/reperfusion injury in diabetic hearts**, Ruben Sloan, Chad Frasier, Fatiha Moukdar, Brian Hayes, David Brown
4:00-5:30	P45	**MicroRNA-34c loss of function promotes axon growth in regenerating primary dorsal root ganglion neurons**, Mohamed Raafat, Abdalla H. Raafat, Di Wu
4:00-5:30	P46	**Hypoxia and serum deprivation in human mesenchymal stem cells, and the protective role of thymosin beta-4**, Katherine Crifasi, Pradhan Payal, Maria Collins, Barbara J. Muller-Borer
4:00-5:30	P47	**Effects of Cisplatin on the Actin Cytoskeleton: Potential Target for Reducing Cytotoxicity and Enhancing Anti-Cancer Therapy**, Amy Friesland, Qun Lu

MSC Room 244

Education – Graduate (9:00am – 10:00am)

9:00-10:00	P48	**The Resurfacing Debate: Historical Perspectives to Multiple Entry-Levels to RN Practice,** April Matthias

Nutrition and Dietetics – Graduate (9:00am – 10:00am)

9:00-10:00	P49	**The Lost Art of Cooking and Generation Y,** Meagan Piland, Barbara Woods, Stacy West, Kylie Gearhart, Kimberly Heidal, Sarah Colby
9:00-10:00	P50	**Multidisciplinary teaching approaches to food science maintains student attitudes and improves efficacy**, Sara McLeod, Virginia Carraway-Stage, Melani Duffrin
9:00-10:00	P51	**Validation of a Dietary Intake Tool among African American Hemodialysis Patients**, Alexis Briley
9:00-10:00	P52	**Approved Nutrient Content Claims and Health Claims; Effect on Consumer Perception and Purchase Behaviors**, Shelley Opremcak

Human Health – Graduate (9:00am – 11:30am)

9:00-10:00	P53	**Health Locus of Control and Coaches**, Danielle Harmon
9:00-10:00	P54	**Regression Equations for Skinfolds with DXA as Standard**, Dustin Raymer
9:00-10:00	P55	**Vestibular and Ocular Motor Function Following Blast Injury**, Kristal Mills, Stephanie Cole, Andrew Stuart, Timothy Jones, Sherri Jones
9:00-10:00	P56	**Bariatric Surgery, Insulin Secretion, and Insulin Sensitivity in Type 2 diabetics: Role of Proximal Small Intestine Bypass**. CI Amato, MA Reed, WJ Pories, WH Chapman, JR Pender, H Barakat, T Green, E Tapscott, CA Tanner, RH Peacock, TP Gavin, and GL Dohm.
9:00-10:30	P57	**Bariatric Surgery and Insulin Sensitivity in Obesity: Role of Proximal Small Intestine Bypass**, RH Peacock, MA Reed, WJ Pories, WH Chapman, JR Pender, H Barakat, T Green, E Tapscott, CA Tanner, CI Amato, TP Gavin, FACSM and GL Dohm
9:00-10:30	P58	**Transcriptional regulation of skeletal muscle GLUT4 by elevated long chain fatty acids**, Laura Rice, Morgan Pearce, Terry Jones, Jonathan Williams
9:00-10:30	P59	**Is Insulin Sensitivity Related to Skeletal Muscle Mitochondrial Function in Type II Diabetes?** JM Ernst, HB Kwak, RD McKernie, AH Clark, P Brophy, M Dar, WE Pofahl, GL Dohm, TP Gavin
9:00-10:30	P60	**Changes in running velocity result in changes in negative and positive lower extremity joint work**, Jonathan Goodwin, Jon Cole
9:00-10:30	P64	**Effects of six-week static and dynamic hamstring stretching programs on hamstring flexibility and lower extremity biomechanics,** Lee Welch, Christina Pate, Dustin Turner
10:00-11:00	P65	**The effect of foot orthotic devices on lower extremity coupling when landing from a jump,** Jeanne Graf, Hannah Bendahmane
10:00-11:00	P66	**Divided-attention Responses in Older vs Younger Adults Following Training with Multi-directional Stepping or Endurance and Leg Strengthening,** Samantha Moore

10:00-11:00	P67	**Role of ACSL1 in Mitochondrial Skeletal Muscle Fatty Acid Oxidation in Human Skeletal Muscle,** Rocio Ellis, Julie Cox, Robert Hickner, Hyo-Bum Kwak, Tracey Woodlief
10:30-11:30	P68	**Strength & Endurance Changes in Healthy Older Adults versus Healthy Younger Adults After Six-Weeks Using Different Training Programs,** Katherine Schendt, Sue Leach
10:30-11:30	P70	**Balance Responses in Older and Younger Adults Following Training using Multi-directional Stepping or Strength and Endurance Protocols,** Trudy Bundy

Technology and Computer Science – Graduate (9:00am – 10:30am)

9:00-10:30	P61	**Sigma-Feature Based Online Face Recognition**, Muhammad Mehdi
9:00-10:30	P62	**Implementation of a Practical Public Key Cryptosystem Provably Secure against Adaptive Chosen Ciphertext Attack**, Steven Ulrick
9:00-10:30	P63	**On-Board Sound Intensity Noise Measurements of North Carolina Pavements**, Richard Shores, Josh Botts,

*Natural Sciences – Graduate (10:30 – 11:30am **and** 1:00pm – 4:30)*

10:30-11:30	P71	**Nanoparticles affect the growth and microRNA expression in plants**, Caitlin Burklew, Taylor Frazier, Guiling Sun, Baohong Zhang
10:30-11:30	P72	**Establishing a Signature for Polycyclic Aromatic Hydrocarbons from the Deepwater Horizon Oil Release, to Trace in Marine-to-Land Transport**, Kimberly Scalise, Siddhartha Mitra
10:30-11:30	P73	**Different kinds of habitat complexity alter predator-prey interactions in different ways**, Jon Davenport, David Chalcraft
10:30-11:30	P74	**Distribution of Diagnostic Carbon Fixation Genes in a Deep-Sea Hydrothermal Gradient Ecosystem**, Heather Blumenfeld, Matthew Schrenk, William Brazelton, Cody Cutler, Sarah Chowdhury

1:00-3:00	P75	**Understanding biodiversity: testing species boundaries within North American tarantula diversity (Araneae, Mygalomorphae, Theraphosidae)**, Christopher Hamilton, Jason Bond,
1:00-3:00	P76	**Incorporating field techniques and ArcGIS to assess trends in reptile and amphibian diversity across varying levels of urbanization**, Scott Jones, Thomas Pauley
1:00-3:00	P77	**Effects of mesozooplankton grazing on phytoplankton growth in the chlorophyll maximum of the Neuse River Estuary**, Benjamin McGlaughon
1:00-3:00	P78	**Gametogenic Development and Spawning in the Arctic Bivalve *Macoma calcarea* (Gmelin, 1791) in Adventfjord, Svalbard**, Andrew Cathey
1:00-3:00	P79	***Packera tomentosa* (Asteraceae) Seed Mass Characteristics and Implications for Germination Behavior**, Lindsay Leverett, Chelsea Barbour, Courtney Koch, Jason Paxton, Claudia Jolls
1:30-3:00	P90	**An in situ exploration in jellyfish-hypoxia research,** Mahealani Kaneshiro-Pineiro, Benjamin McGlaughon
1:30-3:00	P91	**Separation of Preservatives Using Green Subcritical Water Chromatography,** Brahmam Kapalavavi
1:30-3:00	P92	**Kinetic modeling of the reaction and crystallization of acetylsalicylic acid using ATR UV-vis spectroscopy,** David Joiner, Julien Billeter, Mary Ellen P. McNally, Ron M. Hoffman, Paul J. Gemperline
1:30-3:00	P93	**Spatial and Temporal Variability of Surface Shelf Sediments on the Waipaoa River Margin, New Zealand,** Joseph Kiker, J.P. Walsh, D. Reide Corbett
3:00-4:30	P94	**Is predation by turtles sufficiently strong to affect invertebrate biodiversity?** Charles Williams, David Chalcraft
3:00-4:30	P95	**Illuminating 2D porosity and pore geometry in moldic limestones: An example from the Upper Castle Hayne Aquifer, North Carolina,** Alexander Culpepper, Alex Manda

3:00-4:30	P96	**Diversity and group specific degeneration of the RNA polymerase II C-terminal Domain,** Chunlin Yang
3:00-4:30	P97	**Surfactant Assisted Electrospray Ionization Time of Flight Mass Spec of non-polar Synthetic Polymers coupled with chromatographic separation,** Robert Raines, Christopher Williams
3:00-4:30	P98	**From Dormancy to Dominance: How Priority Effects and Predation Influence Temporary Pond Crustacea,** Lauren McCarthy, David Chalcraft
3:00-4:30	P204	**Subsurface fracture distribution and influence of fractures on groundwater flow in the Piedmont and Blue Ridge physiographic provinces of North Carolina,** Justin Nixon, Alex Manda

Social Sciences – Graduate (1:00pm – 4:30pm)

1:00-3:00	P80	**Integrating the Coordinated School Health Program(CSHP) into School Health and School Based Mental Health Interventions to Prevent Suspension, Academic Failure, and Dropout in Ayden School Community**, Richelle Smallwood, Danielle Harmon
1:00-3:00	P81	**Practice Change: Implementation of SBIRT Substance Abuse Protocol in Primary Care**, William Atherton, Marina Stanton, Paul Toriello
1:00-3:00	P82	**Medical Family Therapy in a Primary Care Setting: A Model of Integration**, Daniel Marlowe
1:00-3:00	P83	**Reducing Liability: an assessment of agritourism practices**, Shannon Arnold
1:30-3:00	P84	**Social Networks in Rural Tourism Destinations**, Jerry Tsao, Paige Schneider, Carol Kline
1:30-3:00	P85	**Planning for Hurricanes in Coastal North Carolina: A Typology of Organizational Decision Making**, Michelle Covi, Donna Kain
1:30-3:00	P86	**An Osteobiographical Analysis of the Foscue Plantation Burial Vault, Pollocksville, Jones County, North Carolina**, Melinda Seeman
1:30-3:00	P87	**A Systematic Review of Interventions for Military Couples**, Melissa Lewis, Angela Lamson
1:30-3:00	P88	**Becoming Hmong-American for a Day: Immersion into Hmong Culture**,

		Jacqueline Coleman-Carmon
1:30-3:00	P89	**College Students Financial Attitudes and Behaviors: Multiple Influences**, Kristen Kaverman, Taylor DeMagistris,Tiffany Powell
3:00-4:30	P99	**Images of Race and Gender in State Travel Guides from the Carolinas: The Importance of Socially Responsible Tourism Marketing in the post-Civil Rights South**, Michaelina Antahades, Derek Alderman
3:00-4:30	P100	**Care, Education and Developmentally Appropriate Practices as understood by Day Nursery and Kindergarten Japanese Teachers**, Chisato Sugita, Archana Hegde
3:00-4:30	P101	**An Analysis of global trends in homicide (2003-2008): Do we live in a violent world?** Brittany Ausley, Rachel Frazier
3:00-4:30	P102	**Reinterpreting cribra orbitalia etiology in a coastal North Carolina Algonkian population using CT scans**, Crystal Vasalech
3:00-4:30	P103	**Sustainable Food System of Eastern North Carolina**, Garrett Ziegler,
3:00-4:30	P104	**Analyzing Resident Place Satisfaction in a Tourist Destination through Auto-Photography: The Case of Southern Shores, North Carolina**, Allison Hueber, Derek Alderman
3:00-4:30	P105	**Stop the Hovering: Helicopter Mentor, A New View on the Dysfunctional Mentor**, Catherine Buria
3:00-4:30	P106	**The Effects of Presentation Rate on Semantic, Syntactic, and Orthographic Processing on Reading Fluency in Children**, Donna Wolfe
3:00-4:30	P107	**College students and credit card debt: the role of parental interactions, work experience, and financial education**. Adam Hancock, Bryce Jorgensen, Meagan Rhodes

Humanities – Graduate (4:00pm – 5:30pm)

4:00-5:30	P108	**Lost in Mayberry: The Impact of the Andy Griffith Show on Sense of Place in Mount Airy, North Carolina**, Stefanie Benjamin, Derek Alderman
4:00-5:30	P109	**Utterance length as it relates to communicative variables in infant vocal development**, Joanne Naylor, Heather Ramsdell, Andrew Stuart
4:00-5:30	P110	**History of a Killer: The Spread of Malaria Throughout the World,** Emily Bone, Angela Thompson
4:00-5:30	P111	**17th Century Corolla Wreck: A Dynamic and Mobile Shipwreck**, Daniel Brown, Brad Rogers
4:00 -5:30	P201	**Autism in Eastern North Carolina: Stories from the Families**, Karen E. Fieselman, Todd Savitt

Wednesday, April 6, 2011 – Undergraduate Oral

Great Room 1

Biomedical Sciences – Undergraduate (9:00am – 11:20am)

9:00-9:20	O53	**The Neurobehavioral Effects of Maternal Iron Status in a Rodent Model of Fetal Alcohol Spectrum Disorder**, Dorothy Dobbins, Iola D Conchar, Ellen M Sheffer, Andrew Norris, Sara Afridi, Lily Medina, Tuan D Tran
9:20-9:40	O54	**Pro-Tumor N2 Neutrophils May Form a Pre-Metastatic Niche**, Dare Imes, Dave Milbourn, Kathryn Verbanac, Jered Cope Meyers, Keith Pittman
9:40-10:00	O55	**The Effect of Whole Body Vibration on Spinal Excitability During Muscle Contraction**, Rebecca Mueffelmann, Tibor Hortobágyi
10:20-10:40	O56	**Transcription factor activity in nanotube induced granulomas in the lungs of mice**, Janki Patel, Isham Huizar, Anagha Malur,Yasmeen Midgette
10:40-11:00	O57	**Sensory dysfunction following spinal cord injury is associated with changes in glycogen synthase kinase-3β activity**, Andrew McGowan, Tiffany Lee, Kori Brewer, Sonja Bareiss
11:00-11:20	O58	**Comparing Clustered DNA Damage Levels in Tissues Distal and Proximal to Tumors in Vivo**, Anastassiya Georgiev

Natural Sciences – Undergraduate (1:40pm – 3:40pm)

1:40-2:00	O59	**The Effects of Simulated Aquifer Storage and Recovery upon the Microbial Diversity and Load in Laboratory Microcosm Experiments**, Amandeep Gujral
2:00-2:20	O60	**Potential Benefits of Cleistogamy in Triodanis**, Emily Stewart
2:20-2:40	O61	**Synthesis and Photophysical Characterization of N^C*N Tridentate Cyclometalated Platinum (II) Complexes**, Deepak Ravindranathan, Dileep A.K. Vezzu

2:40-3:00	O62	**The Role of Synaptopodin-2 in Cancer Cell Differentiation**, Kelli Shortt
3:20-3:40	O64	**Differential expression of FABP in both parenchymal and non-parenchymal liver cells following chronic ethanol exposure.** Sherri Moore

Nutrition and Dietetics – Undergraduate (3:40pm – 4:00pm)

3:40-4:00	O63	**FoodMASTER: Utilizing Hands-on, Food-based Lessons to Introduce New Foods in the Preschool Classroom**, Ashley Roseno

MSC Room 244

Social Sciences, Humanities, & Fine Arts – Undergraduate (9:00am – 11:00am)

9:00-9:20	O65	**An Interpretive Phenomenological Approach: The need to serve among hospitality professionals**. Chelsey Leffet, Alleah Crawford
9:20-9:40	O66	**ECU-Greene County Partnership to Improve School-Based Mental Health: The Relationship of Adjustment, Stress, and Knowledge in Undergraduate College Students to Succeed as a Tutor of At-Risk Middle School Students**, Samantha Scuderi
9:40-10:00	O67	**The Association Between Big Five Personality Characteristics and Frequency of Obsessive Relational Intrusion Incidents**, Mary Madrake
10:20-10:40	O68	**Computer-Based Cognitive Rehabilitation in Pediatric Cancer Patients and Survivors**, Eden Rouse, Tamara Warner
10:40-11:00	O69	**Updating Visitor Profiles at the USS North Carolina Battleship: 2010-2011**, Melissa Sayre, Melissa Emery,Sandra Power,Virgina Annab
11:20-11:40	O70	**"Here we don't die, we shop": The role of the Supermarket in Don DeLillo's White Noise**, Megan Oakes
11:40-12:00	O71	**Nags Head Sustainable Feasability Study**, Brenna Laffey

12:00-12:20	O72	**Piero della Francesca: A New Perspective on "The Flagellation of Christ,"** Allie Craver
12:20-12:40	O73	**Media Influences on Sexual Socialization Among Emerging Adults**, Aisha Powell

Wednesday, April 6, 2011 – Undergraduate Poster

MSC Room 15

Biomedical Sciences – Undergraduate (9:00am – 10:00am)

9:00-10:00	P112	**Peripheral Nociceptive Sprouting After Spinal Cord Injury Correlates With Pain Behaviors**, Tiffany Lee, Kristin Hernandez, Kori Brewer, Sonja Bareiss
9:00-10:00	P113	**Epigenetic Effect of Paternal High Fat Diet on Offspring Susceptibility to Glucose Intolerance in Mice**, Maneesh Jeyakumar, Matthew Parker
9:00-10:00	P114	**Yeast two hybrid interaction studies**, Wayne Rummings,
9:00-10:00	P115	**Regulation of Connexin 43 by Cyclic AMP in Vascular Smooth Muscle**, Danielle Martin, Jonathan C. Fox, Chintamani N. Joshi, David A. Tulis
9:00-10:00	P116	**Effects of GPR4 on Tumor Cell Migration and Proliferation**, Jatin Patel, Reid Castellone, Li Yang
9:00-10:00	P117	**ANALYSIS of COMPLEX DNA DAMAGE ASSOCIATED WITH TUMOR GROWTH**, Nicholas Ferguson
9:00-10:00	P118	**Variability in TMS-induced motor evoked potentials in the Tibialis Anterior at different stimulation intensities**. William Churchwell, with Jaime Talent, Paul DeVita, Tibor Hortobagyi, Gilbert Howatson, Steve Wiggins, Patrick Rider
9:00-10:00	P119	**Repeatability of Motor Evoked Potentials Produced by TMS During Increasing Intensity of Muscle Contraction in the Tibialis Anterior Muscle**. Steven Wiggins, Patrick Rider, Paul DeVita, Glyn Howatson, Tibor Hortobagyi, Jamie Tallent, William Churchwell
9:00-10:00	P120	**Immune Regulation Effects of the Poxvirus A35R Virulence Gene on Splenic Lymphocyte Populations**, Parteek Singla, Kristina Rehm, Rachel Roper
9:00-10:00	P121	**THE EFFECTS OF GROWTH FACTORS ON THE MITOCHONDRIAL PHYSIOLOGY OF HUMAN MESENCHYMAL STEM CELLS**, Arun Ajmera, Ethan Anderson, Maria Collins, Payal Pradhan, Barbara J. Muller-Borer

9:00-10:00	P122	**Creating Imprecise P-element excisions of Drosophila Mcm10**, Hannah Cantrell, Tim Christensen
9:00-10:00	P123	**Effect of PFOA on glycogen storage in an avian model**, Ian Bryan
9:00-10:00	P124	**Expression of TLRR (lrrc67) and Protein Phosphatase-1 Isoforms as Fluorescent Fusion Proteins in Mammalian Cells**, Caitlin Trumbo, Rong Wang, Ann O. Sperry
9:00-10:00	P125	**Using p-element excisions to determine the role of Ctf4 in Drosophila Melanogaster,** Tabitha Reel, Tim Christensen
9:00-10:00	P126	**Loss of TNFR1 up-regulates hepatic SIRT1 expression: possible role of micro inhibitory RNA processing factor DICER,** Kylie Gearhart
9:00-10:00	P127	**MOTILITY BUT NOT PERIPLASMIC FLAGELLA IS INVOLVED IN THE PATHOGENESIS OF LYME DISEASE**, Tristan Boquoi, MD Motaleb
9:00-10:00	P128	**Effect of HTLV-1-encoded protein, HBZ, on CREB mediated-cellular transcription**. Isabelle Nash, Nicholas Polakowski
9:00-10:00	P129	**J-series Prostaglandins Regulate Arachidonoyl Ethanolamide (AEA)-induced Apoptosis in Tumorigenic Keratinocytes**, Christopher Crout, M. Anna Jarvis, Drisheka Thati, Allison Danell, Rukiyah Van Dross
9:00-10:00	P130	**Investigating Tissue Remodeling in EphA2 Knockout Mice in Response to Ischemic Cardiovascular Injury**, Jackson Vuncannon, Susan Kent, Filza Faiz
9:00-10:00	P131	**The Effects of PFOA on TIAR vs. TDAR & PPAR-± Activity, John Creech,** Jamie DeWeitt
9:00-10:00	P132	**Characterization of DNA Polymerase Delta using a combined in vivo and in vitro strategy**, Lena Keller, Chad Hunter, Bonnie Bolkna, Tim Christensen

Human Health – Undergraduate (10:30am – 11:30am)

10:30-11:30	P133	**The Effects of Velocity Change on Lower Extremity Work During the Stance Phase of Running**. Olivia Ratcliff
10:30-11:30	P134	**Effect of a 16 Week Exercise Intervention on Total % Body Fat Changes in Prepubscent Children**, Jordan Overbey, Jeanette Mazzawi, Katie Thomas, Bryan Creidler, Chuck Tanner, Robert Hickner, Cody

		Squibb, Gabriel Geyer
10:30-11:30	P135	**Effect of Exercise Intervention on Submaximal Heart Rates in Lean and Obese Prepubescent Children**, Bryan Creidler, Gabriel Geyer,Cody Squibb,Chuck Tanner, Jeannette Mazzawi, Robert Hickner, Katie Thomas, Jordan Overbey
10:30-11:30	P136	**Effects of a 16 Week Exercise Intervention on Cardiovascular Risk Factors in Obese Prepubescent Children**. Katie Thomas, Jordan Overbey, Bryan Creidler, Cody Squibb, Jeanette Mazzawi, Gabe Geyer, Chuck Tunner, Bob Hickner
10:30-11:30	P137	**The Correlation Between Increasing and Decreasing Temperatures and the Presence of Fleas on Animals Collected by Animal Control in Pitt County North Carolina**, Sarah Raines, Alice L. Anderson
10:30-11:30	P138	**Comparison of Gait Biomechanics at Self-Selected and Standardized Walking Speeds**. Elizabeth Kitchens, Patrick Rider, Mike McNally, Erica Gibson, Tibor Horto, Patrick Rider, Mike McNally, Erica Gibson, Tibor Hortobágyi, Paul DeVita
10:30-11:30	P69	**Perceptions of a Healthy Weight Status in Obese Adolescents: Implications for a Healthy Weight Treatment Program.** Steffany Martin, Vanessa Buonopane, Emily Steinbaugh, Marissa Errikson, Dustin Burrell, David Collier, Lesley Lutes

Nutrition and Dietetics – Undergraduate (1:30pm – 2:30pm)

1:30-2:30	P139	**Omega-3 fatty acid consumption in children in the Southeast**, Kayce Clodfelter, Kimberly B. Heidal, Robert C. Hickner, Meagan N. Piland, Brian Schmitt, Patty Brophy, Charles J. Tanner
1:30-2:30	P140	**Possible Health Impacts from Smoking and Drinking in a College Setting**, Caroline Knauss, Samantha Walters, Kimberly Heidal
1:30-2:30	P141	**Effects of a High-Carbohydrate Diet on the Interleukin Levels of Older Adults**, LaDonna Maddy, Scott Gordon
1:30-2:30	P142	**Promoting Healthly Diet Tools for College Students**, Lamia Nasrallah, Elizabeth Wall-Bassett, Janie Owens, Tara Smith

1:30-2:30	P143	**Role of Liver Circadian Rhythm in Adaptive Immunity**, Laura Kashtan

MSC Room 221

Social Sciences – Undergraduate (9:00am – 10am)

9:00-10:00	P144	**SEXTING: Sexual Content/Images in Romantic Relationships**, Makeda Parker
9:00-10:00	P145	**The influence of religion on young adult's attitudes of dating events.** Sarah Miller, Alan Taylor, Damon Rappleyea
9:00-10:00	P146	**Maternal Sleep and Fatigue: Are They Associated with Maternal Verbal Limit Setting?** Sarah Bradley
9:00-10:00	P147	**The use of technology in dating relationships during emerging adulthood**, Ember McKown, Sarah Miller, Heather Carnahan, Alexis Garcia, Miriam Dari, Alane Collinson, Vue Vu
9:00-10:00	P148	**Testing the Effectiveness of Mindfulness Meditation**, Heather May, Alexandria Caple, Brooke Kemp, Taylor Rush, Benjamin Aydelette, Christyn Dolbier
9:00-10:00	P149	**ICD Shock Reduces Perceived Sense of Security in Patients with an Implantable Cardioverter Defibrillators: A US National Survey**, Justin D. Smith, Jessica Hauf, Katherine Cutitta, Kevin Woodrow, Ashley Walston, Kari Kirian, Garrett Hazelton, Avi Fischer, Julie Shea, Samuel F. Sears
9:00-10:00	P150	**"An investigation on the generalizability of the relationship between extraversion, social support, and health"**, Kelsey Ruffing, Jaleesa McMillan
9:00-10:00	P151	**The effects of sociability and neuroticism on personal health**. Darryl Wright
9:00-10:00	P152	**Female Masturbation: Attitude Change via Lecture vs. DVD (Personal Discussion)** Amanda Lee, Megan Keels, David Knox, Ken Wilson
9:00-10:00	P153	**Older lesbians dealing with the loss of a partner**, Amanda Edmundson
9:00-10:00	P154	**The Effects Of Teasing In Obese Adolescents As It Contributes To Stigma And Potential Impact On Subsequent Weight Loss Attempts**, Dustin Burrell, Emily Steinbaugh, Marissa Errickson, David Collier, Leslie

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Natural Sciences – Undergraduate (10:30am – 11:30am)

10:15-11:30	P156	**Exploring the Microbial Diversity of Alkaline Carbonate Biofilms of Newfoundland, Canada and Ligurian Springs of Italy**, Brigid O'Boyle, Bridget Nelson, William Brazelton, Matt Schrenk
10:15-11:30	P157	**Dorsal Pad Structure and Function in a Parasitic Copepod**, Aaron Wallace
10:15-11:30	P158	**Infrared Spectroscopy for Archeological Artifact Identification**, Brianna Biscardi
10:15-11:30	P159	**CD Spectroscopy**, Matthew Stump
10:15-11:30	P160	**Progress towards mapping indeterminate floral apex1, a gene required for maize inflorescence development**, George Vuong
10:15-11:30	P161	**Spatial correlates of nest box placement for optimizing reproductive success in Eastern bluebirds**, Claire Perry, Kimberly P. Wade, Charles E. Williams, William F. Davis, Dunya M. Safa
10:15-11:30	P162	**Determining the presence of lanolin from ancient bathtub samples obtained in Cyprus and Israel**. Kimberly Tillapaugh
10:15-11:30	P163	**Assessing Long Term Trends of Groundwater Levels in the Surficial Aquifer of North Carolina**, Jessica Kegel, Alex Manda
10:15-11:30	P164	**The Optimization of the Organic Synthesis of the Indanone Precursor to Indatraline**, Meagan Decker
10:15-11:30	P165	**Variation in Dentition of Threespine Stickleback**, Terra McSwain
10:15-11:30	P166	**Phenotypic correlates of female color polymorphism in a California stickleback population**, Samantha Mears
10:15-11:30	P167	**Effects of Biofuel Production Practices on Abundance and Diversity of Herpetofauna**, Zachary Aardweg, Jessica Homyack, David Chalcraft
10:15-11:30	P168	**Deciphering migration and gene flow patterns from historic and extant**

		population fragmentation effects in an endemic California spider Aphonopelma reversum, Xavier Atkinson, Chris Hamilton, Jason Bond
10:15-11:30	P169	**Fitness Components of Color Pattern Variation in a Female Polymorphic Stickleback Population**, Kevin Shah,
10:15-11:30	P170	**The Territorialism and "Social Networks" of Dusky Damselfish and Yellowtail Damselfish**, Jessica Pendergrass
10:15-11:30	P171	**Determining the Biodiversity and Microbial Load Associated with Restoration of the Queen Anne's Revenge Shipwreck**, Shanley Church, Matthew Schrenk, Shanna Daniel
10:15-11:30	P172	**Comparison of Microscopic Methods for Characterizing Rock Hosting Microbial Communities**, Hilary Conrad, Matthew Schrenk
10:15-11:30	P173	**Phylogenetics of the millipede genus Brachycybe Wood, 1864 (Diplopoda: Platydesmida: Andrognathidae) using mitochondrial and nuclear genes**, Nandita Rao, Michael Brewer, Jason E. Bond, Chad Spruill
10:15-11:30	P174	**Characterizing On-Site Wastewater Plumes with Electrical Resistivity Surveys,** Sarah Hardison, Charles Humphrey, Matt Smith, Michael O'Driscoll, David Mallinson
10:15-11:30	P202	**Developmental Regulators in the Red Alga Porphyra,** Justin Perry, John Stiller

Technology and Computer Science – Undergraduate (1:00pm – 2:00pm)

1:00-2:00	P175	**Techniques of Passive Solar Design**, Matthew Howard, Brittany Pearce, Robert Thobe, Christopher Fortune
1:00-2:00	P176	**ASMO: Getting Leaner**, Bryan Britton, Corey Phelps
1:00-2:00	P177	**Energy Savings Technologies in New and Previously Constructed Homes**, Johnathan Dennis, Chris Duryea, Regan Sigler, Hannah Tart, Ethan Ayers
1:00-2:00	P178	**Residential Landscaping Practices in Wake County, North Carolina as a Means of Improving Home Energy Conservation**, Bryce Oakley, Antwan Edwards, Tyler Hicks, Joshua Johnson, Ryan Ramsey

1:00-2:00	P179	**IENG 4900 Capstone Abstract**, Robert Daniel, Spencer Fox
1:00-2:00	P180	**Harper Brush VersaCall**, Pawan Bhat, William Anderson Winbourne
1:00-2:00	P181	**Grey Water Re-Usage Methods**, Amber Idol, Fredde Rivas, Christopher Borrell, Joseph Worthington, Andamo Ford

Humanities and Education – Undergraduate (2:30pm – 3:30pm)

2:30-3:30	P182	**The Quest for Ubiquitous Access in North Carolina's High School: The Digital Divide in Rural North Carolina**, Heather Ayers
2:30-3:30	P183	**Utilization of Expert Client for Interim Feedback in Engineering Design Project,** Paul Cox, Stephanie Sullivan,Cathy Hall,Eric Buller
2:30-3:30	P184	**Government and medicine: the evolution of the Chinese health-care system**, Brittany Carr
2:30-3:30	P185	**North Carolina Contemporary Indians: A Sense of Place**, Martha Wharton,

Engineering – Undergraduate (3:00pm – 4:00pm)

3:00-4:00	P186	**The Overall Efficiency of Selected Residential Insulation and Roofing Materials**, Jonathan Messer, Isaac Edwards, Michael Schultz, John Switzer
3:00-4:00	P187	**Essential Functions Analysis**, Kimberly Weaver, Constanse Floyd, Daniel Lee, Josh Carr ,Mike Markowkin, Sepideh Jahromi
3:00-4:00	P188	**NASA Capstone Abstract**, Taylor Brown, Jamelle Simmons, Anna Smith, Christian Denard
3:00-4:00	P189	**Preventive and Predictive Maintenance Program Design for an Industrial Equipment Fabrication and Repair Facility**, Scott Reed, Dao Dinh, Adam Hussaini
3:00-4:00	P190	**Rheological Functionality of Cross-linked Whey Protein Isolate/Pullulan Gels**, Jamelle Simmons, Eric Franson, Mohammed Akbar, Stephanie T. Sullivan, Thomas J. Fink, Michelle D. Robinson, David P. Cistola

3:00-4:00	P191	**Impact of sodium trimetaphosphate on aqueous protein-pullulan solution rheology and electrospinning**, Adam Hussaini, Dao Dinh, H. Ray Tichenor, Andrew M. Cathey, Stephanie T. Sullivan
3:00-4:00	P192	**Energy Consumption in Low-lift Walkie Trucks**, Matthew Liverman
3:00-4:00	P193	**Rear Impact Guard Test Stand, Michael Trapani**, James Herrison, Clinton Reges
3:00-4:00	P194	**Pullulan nanofiber crosslinking**, Victoria L. Miller, Thomas Deaton, Stephanie T. Sullivan
3:00-4:00	P195	**Solution electrospinning of hydroxypropyl-β-cyclodextrin and pullulan blend nanofibers**, Joseph A. Rose, Clayton D.Rice, H. Ray Tichenor, Andrew M. Cathey, Stephanie T. Sullivan
3:00-4:00	P196	**Crosslinking of protein-polymer solution electrospun nanofiber mats by heat treatment method**, Dustin Rogers, Abel Tesfaslassie, Stephanie Sullivan
3:00-4:00	P197	**Reduction of VOC Emissions**, Catherine Smith, Victoria Miller
3:00-4:00	P198	**Safety Restraining Device for Aft Transmission Installation and Removal**, Matt Uzzell, Ken Drake, Chuck Norris
3:00-4:00	P199	**Water Conservation Analysis and Design for DSM Pharmaceuticals**, David White, Travis Marsh, Nathan Berkner
3:00-4:00	P200	**Design of a Universal Filter Containment Housing**, Samuel Millard, Joe Rose, Cory Boughton

ABSTRACTS:
GRADUATE & UNDERGRADUATE

Online, Oral, & Poster

Graduate Online Presentation Abstracts	ID #
A Pilot Study: Undergraduate Nursing Students' Evaluation of an Online Survey to Assess Interest and Intent for a Future Faculty Role, Diana Bond, East Carolina University, Greenville, NC 27858 The purpose of this small pilot study was to solicit feedback about a Qualtrics' online survey created for a doctoral dissertation about undergraduate nursing students' interest and intent for a future nursing faculty role. In addition, the approximate amount of time for participants to complete the survey was measured and the functionality of the software was assessed. After Institutional Review Board approval, the study was described to 116 senior undergraduate nursing students enrolled in class at a southeastern university. All students were asked to check whether or not they were interested in piloting the survey and to provide their contact information. Twenty-three (20%) of the nursing students volunteered to pilot the survey and the names of five students were randomly drawn. All participants were female, mean age 21.6, and four of the five students were Caucasian and one was Latino/Hispanic. To determine how the online tool functioned, the participants were observed and timed while they completed the online survey. Three students met individually and two met as a group. While completing the survey, students provided feedback. At the end of the evaluation, students were given a $10 gift card in appreciation for their time and feedback. All of the students found the online interface easy to use. The mean amount of time to take the survey was 17 minutes (range 10-32 minutes), which included discussion time of the students' feedback. Three students asked questions and made suggestions about the survey on parent's education, the definition of peer teaching and the meaning of "assume" in "assume you want to become a faculty member" from a question stem. Two students also offered suggestions to improve the survey's functionality, such as adding spacing between the directions and the questions and a progress bar. Students were also asked for ideas about the type and delivery of incentives that would appeal to students for the larger dissertation study. Three students suggested a monetary incentive or a prize drawing. Students were asked if offering a donation to a charity would be an incentive. One student suggested that the researcher allow the respondents a choice among several charities and then allocate the appropriate percentage of $500 for those choosing each charity. This suggestion was accepted by the researcher.	D1

Meaning and Lived Experiences of Deployment as Perceived by Military Officer Spouses/Partners, Marcy Bitner, Department of Health Education & Promotion, East Carolina University, Greenville, NC 27858 This study addressed the question, "What is the lived experience of and meaning held by military officers' spouses/partners regarding multiple, year-long or longer deployments of their active duty military spouse/partner in the post-9/11 era?" A literature review indicated a paucity of information about this relatively new phenomenon and indicated that the impact on spouses/partners warranted investigation. Study findings provide insight for health professionals about stressors experienced and coping mechanisms used by military officer wives/partners who are parents and who had experienced at least two deployments of at least one year in duration. The findings afford an in-depth understanding of the complex and emerging issues faced by these individuals. The researcher used Max van Manen's approach to hermeneutic phenomenology to guide the study. This approach focused on employing individuals' reflections on their experiences in order to reach an understanding of the deeper meaning of the experience. The researcher used two primary methods of data collection: a) audio recorded in-depth, open-ended interviews with handwritten field notes taken during each interview, and b) letters written by each participant to a theoretical other partner or spouse of a frequently deployed military officer. The researcher used purposive sampling to recruit seven participants who had been military officer spouses for between five and seventeen years and who experienced between two and six spousal/partner deployments. Strategies to address study credibility included methodological congruence, triangulation, thick description, prolonged engagement in the field, continuing search for disconfirming evidence, verbatim transcription, engagement in reflexivity, maintenance of an audit trail, and data saturation. Data were coded and analyzed for patterns and themes in an effort to identify the essence of participants' lived experience. The researcher will present the findings associated with the study.	D2
Graduate Oral Presentation Abstracts	ID #
Always a Bigger Fish - The influence of size and habitat on the feeding habits of spiny dogfish (*Squalus acanthias*) in North Carolina waters, Charles Bangley, East Carolina University, Greenville, NC 27858 The spiny dogfish (*Squalus acanthias*) is a small shark that overwinters in large numbers in the coastal waters of North Carolina. Spiny dogfish are generalist predators and the majority of their diet is made up of teleost fishes. There is interest in the feeding habits of spiny dogfish due to suspicion of these sharks preying upon and competitively excluding species important to commercial and recreational fisheries. Stomach contents, size, and sex data were collected from 399 spiny dogfish sampled in North Carolina waters during the months of February and March, 2010. Data on depth, water temperature, and the abundance of other species were also collected from each	O1

sampling station. Prey species were identified to the lowest possible taxa and grouped into broad prey categories. Fish prey were more important with increasing dogfish size, while crustaceans and other invertebrates increased in prevalence with decreasing shark size. Dogfish size was correlated with both depth and temperature. The results of this study suggest that size may influence habitat use and feeding habits of spiny dogfish during their seasonal residence in North Carolina waters.	
Distribution Patterns of Juvenile Spotted Seatrout (*Cynoscion nebulosus*) and Red Drum (*Sciaenops ocellatus*) in relation to habitats along Pamlico Sound, North Carolina, Joey Powers, Anthony Overton, Wayne Mabe, East Carolina University, Greenville, NC 27858 The association of juvenile spotted seatrout and red drum with submerged aquatic vegetation is well documented; however, their association with other estuarine habitats including shallow sandy areas is not well understood. The goal of this project was to evaluate habitat use of juvenile spotted seatrout and red drum along shallow sandy beaches in Pamlico Sound, North Carolina. The specific objectives were to examine the spatio-temporal distribution of spotted seatrout and red drum. In addition, to evaluating the effects of environmental factors that influence distribution patterns. Juvenile spotted seatrout and red drum were collected bimonthly along Pamlico River, North Carolina from August through November (2009-2010). Spotted seatrout and red drum were most abundant in the central portion of the river, with the highest abundance accruing in October for red drum and September for spotted seatrout. Habitats were characterized by sand, detritus or SAV substrates and with favorable water quality. Red drum showed more of an association to detritus (66%), than to sand (12%) or SAV (22%) throughout both sampling seasons, while spotted seatrout showed a better association to SAV (55%). The results of this study show how a euryhaline environment and substrate could potentially influence fish distribution patterns within a watershed.	O2
Surfactant Assisted Electrospray Ionization Time of Flight Mass Spectrometry of Synthetic Polymers. Christopher Williams, East Carolina University, Greenville, NC 27858 Electrospray Ionization Time of Flight Mass Spectrometry (ESI-ToF-MS) has significant unrealized potential in the characterization of synthetic polymers. ESI is widely used for biomolecule characterization, but two factors currently limit the utility of this technique for synthetic polymer characterization: 1) electrospray ionization often results in multiply charged species for each component in the sample (each charge state results in additional peaks). Synthetic polymers contain a distribution of many compounds, with close, uniformly spaced masses. The presence of multiple peaks for each mass quickly results in data that is beyond any reasonable interpretation. 2) Electrospray ionization is best suited for polar, easily ionized species dissolved in polar solvents. The vast majority of synthetic polymers are relatively non-polar, do not ionize easily and are not	O3

soluble in the polar solvents most often used for ESI. By adding easily ionizable, surface active compounds that associate with polymer molecules during ionization, we have made significant strides in overcoming both of these limitations. Results so far indicate that the surface active molecule Cetyltrimethylammonium Bromide as a cationizing agent under proper experimental conditions can generate a clean ESI-TOF-MS mass spectra of only singly charged ions for poly(methyl methacrylate) and even relatively non-polar polystyrene samples well in excess of 10,000 g/mol. These results could not previously have been obtained and represent a step change in mass spectrometric characterization of synthetic polymers.	
Kinetic modeling of dissolution of salicylic acid with in situ ATR UV-vis spectroscopy, Chun H. Hsieh[1], Julien Billeter[1], Mary Ellen P. McNally[2], Ron M. Hoffman[2], Paul J. Gemperline[1] [1]Department of Chemistry, East Carolina University, Greenville, NC 27858, [2]E. I. DuPont de Nemours and Co.,Inc., Crop Protection Products and Engineering Technologies, Stine Haskell Research Center, Newark, DE 19711 Process Analytical Technologies (PAT) recommended by the Food and Drug Administration (FDA) have significantly increased during the past years in the design, control and monitoring of pharmaceutical manufacturing processes [1]. Nowadays PAT is also commonly used in Good Manufacturing Practices (GMP). Some PAT techniques employ on-line fiber-optic sensors to acquire non-destructive measurements of physical properties, kinetic information about dissolved molecule and solid fraction of particles in slurries, in real time [2]. This study uses attenuated total reflectance ultra-violet visible (ATR UV-vis) spectroscopy for kinetic modeling of the dissolution of salicylic acid in ethanol-water within a small-scale semi-batch reactor. The dissolution model, which relies on a power-law equation, can be obtained by adding aliquots of an ethanol-water mixture into a salicylic acid slurry. Near-infrared (NIR) diffuse reflectance spectroscopy is used to detect the degree of saturation and quantify the solid fraction using a classical Kubelka-Munk transformation followed by a calibration. A temperature probe is also used to monitor heat changes involved in this dissolution. **References** [1] Fevotte G., International Journal of Pharmaceutics 241 (2002) 263-278 [2] Gemperline et al, Analytical Chemistry 76 (2004) 2575-2582	O4

Spatial and Temporal Changes in the Biogeography of Fishes along Intertidal Sandflats in Pamlico Sound, North Carolina, Michael Mabe, Anthony Overton, Joey Powers, East Carolina University, Greenville, NC 27858 Fish distribution along estuarine systems can be influenced by both biotic and abiotic factors and can be system dependent. Some of the most important factors are temperature, salinity, and dissolved oxygen. Maintaining biodiversity is important to prevent loss of estuarine services such as economically important fish. Fish were collected bi-monthly from August through November in 2009 and 2010 using an 18.3m long beach seine. Fish were identified in the field, counted, and released. Water quality was measured using an YSI-Pro and a 1L water sample was collected at nine selected sites. Statistical analysis was calculated using PRIMER-6 software. In all 73,828 fish were counted representing 43 species. Five species (*Anchoa mitchilli, Menidia menidia, Brevoortia tyrranus, Leiostomus xanthurus,* and *Lagodon rhomboides*) accounted for more than 97% of the total catch. Using the ANOSIM function in PRIMER the data show that there is a significant difference in water quality and fish assemblage among the western, central and eastern sections of river. The SIMPER function was used to determine the contribution of each species to the structuring of fish assemblage. Key taxa are those accounting for over 90% of the similarity among sections. No one species accounted for 90% of the similarity, however, *Anchoa mitchilli, Menidia menidia, and Leiostomus xanthurus* together accounted for over 90% of the similarity at all three sections. The data show intertidal sandflats are important habitat for fish in Pamlico River estuary and they should be included in the delimitation of essential fish habitat.	O5
Asymmetric development of the female reproductive tract in elasmobranchs: a comparative-analysis of modes of reproduction and life history traits. Lyndell Bade, East Carolina University, Greenville, NC 27858 Elasmobranchs (sharks, skates, and rays) exhibit diverse reproductive modes, including internal fertilization, and either oviparity with external development or internal development via viviparity or ovoviviparity. For example, in many batoid species, the eggs are held internally, develop in the egg sac, and then the fetuses are fed through the excretion of a uterine fluid. Asymmetric reproductive tract development in the female is exhibited across many taxa, predominantly with left-sided functionality and vestigiality of the right side of the uterine tract. This is remarkably similar to birds, where it is viewed as a flight adaptation. It is conceivable that this is a load-lightening adaptation in elasmobranch species that travel long distances. A literature review will be used to identify reproductive modes and life history traits across elasmobranch diversity. Comparative analysis will be used to relate asymmetric development of the reproductive tract with reproductive mode and ecomorphology, as well as ecological traits such as migratory habit, migration distance, natal dispersal pattern, and habitat type. The study of reproductive anatomy of elasmobranchs is at a	O6

rudimentary stage, where life history and reproductive traits of many species are poorly known due to difficulties with observation and capture logistics. Furthermore, new species are being discovered at a high rate. This study will add to our knowledge of reproductive adaptation of these fascinating but imperiled animals.	
Surface and groundwater quality in the Alligator River estuarine system, North Carolina, <u>Angela Giuliano,</u> Alex Manda, Department of Geological Sciences, East Carolina University, Greenville, NC 27858 The Emily and Richardson Preyer Buckridge Coastal Reserve is a low-lying, peatland-dominated peninsula that is bounded by drowned tributaries of the Alligator River estuarine system. For over a century, construction of a canal network dedicated to forestry activities and draining of adjacent agricultural lands has altered the hydrology of the reserve. In recent years, observations show that saltwater intrusion linked to the Alligator River is degrading the ecosystem. In this study preliminary results indicate elevated levels of salinity in groundwater, canals and the Alligator River. Electrical conductivity data indicate that brackish water conditions are present in both the canal network and the groundwater system. Salinity levels in the Alligator River are observed to be more elevated upstream than downstream, particularly under the influence of southwesterly winds. The groundwater data also reveal that salinity levels are lower in the north than the south and the north has less variability in electrical conductivity. Based on these observations, it is hypothesized that the intra-coastal waterway to the south of the reserve is acting as a conduit for saltwater intrusion from the Pamlico Sound. Canals that are not directly connected to the Alligator River have less variability of salinity than canals that are connected to the river which are influenced by variable wind tide directions. Ongoing monitoring of salinity distributions in the canal network and groundwater system will be used to determine processes that could contribute to the degradation of the ecosystem in the reserve.	O7
Prey risk assessment and antipredator behavioral choices in larval anurans, <u>Molly Albecker</u>, Heather Vance-Chalcraft, East Carolina University, Greenville, NC 27858 Larval anurans assess risk and make behavioral choices to avoid predation. Since antipredator behaviors may reduce foraging opportunities, prey behavioral decisions can be constrained by a tradeoff between survival and growth. To improve our understanding of prey risk assessment, we asked whether *L. sphenocephala* tadpoles make behavioral choices based on characteristics of predators, such as their lethality, microhabitat use, or taxonomic group. To test this question, we ran an experiment in aquaria that included 13 treatments (6 predators x lethal/non-lethal plus a no-predator control), replicated eight times in a temporal block design. Three predators occupy benthic microhabitats (White crayfish, Pachydiplax dragonfly larvae, and Pirate perch), and three occupy	O8

pelagic microhabitats (Bluegill sunfish, Broken-striped newt, and Fishing spider). We made behavioral observations of each aquarium twice during each trial, and recorded the prey remaining at the end of each 20-hour trial. Predator microhabitat use and taxonomic grouping influenced prey behavior, but predator lethality did not. Benthic predators reduced prey movement and the number of tadpoles along the benthos. Fewer prey were visible throughout the tank and fewer prey inhabited the benthos when confronted with a fish predator. Vertebrate predators induced more prey to hide in leaf litter but caused proportionately fewer tadpoles to occur in the benthic region. Our work suggests that the simple lethality of a predator is not used as the primary risk assessment strategy by larval anurans. Rather, predator characteristics such as microhabitat use and taxonomic affiliation may be assessed by tadpoles when determining the potential risk of predation.	
The Influence of Leaf Litter Type on the Biodiversity of Temporary Ponds, Robert Deans, David Chalcraft, East Carolina University, Greenville, NC 27858 Understanding the factors that affect biodiversity in nature is a fundamental goal of ecology. One such factor that has been underestimated in pond communities is the input of detritus. Detritus, such as leaf litter, can have bottom-up effects on community structure in aquatic systems. Different kinds of leaf litter can vary in quality in several ways, including the rate at which they release nutrients and energy into the water and in the particular kind of habitat structure that they provide. We conducted an experiment to examine the influence of different kinds of litter on biodiversity within temporary ponds located in eastern NC. Temporary ponds can have unique and diverse communities, including some threatened species, and are often important components of regional biodiversity. We manipulated the kinds of leaf litter (sedge, pine, or maple) present in artificial ponds to evaluate whether there are differences in the abundance and diversity of macroinvertebrates and amphibians that successfully colonize the ponds. We conducted this experiment at two different spatial scales, within and among each of three plant communities (open-canopy grassland, pine forest, and hardwood forest). Preliminary results suggest that the type of leaf litter present in a pond affects the abundance and diversity of taxa in temporary ponds, but the type of canopy cover surrounding the pond seems to have a larger impact on biodiversity, with open-canopy systems supporting more diversity than forested systems. In addition to providing insight into a fundamental question of why some locations are more diverse than others, our work provides insight into how human activity that changes habitat (and hence litter) type alters the biodiversity of pond communities, and it could shed light on whether particular kinds of habitat may require more conservation priority than others.	O9

Trapped Photon Wavefunctions Near a Black Hole, Davidson Wicker, Orville Day, David Pravica, Department of Mathematics, East Carolina University, Greenville, NC 27858 Resonant (standing wave) photons of Ultra Low Frequency (ULF) are trapped by the gravitational potential energy well surrounding a black hole. The potential well and effective Schroedinger equation are given by General Relativity. We show the shapes of the lowest frequency photonic wavefunctions near a Schwarzschild black hole. The ULF resonant photons have the following interesting properties: (a) Near the supermassive black hole (SBH) (~3.6 million solar masses) around which our entire Milky Way Galaxy rotates, these trapped photons have the longest wavelength of any electromagnetic (EM) waves yet discovered in the Universe. This wavelength is very large since the SBH has a radius at the event horizon equal to 3.6 million times 2.97 km. The lowest frequency (~1 mHz) photons have a wavelength equal to 260 times the average Earth-Moon distance, or 5.6 min., at the speed of light. There are SBHs at the centers of neighboring galaxies, which have hundreds of times the mass of the one at the center of our own galaxy. Consequently, the longest wavelengths of photons trapped near them are hundreds of times greater than the longest near our own SBH. That would mean there are photons with wavelengths up to about 5000 minutes (~83 hours) at the speed of light, that are trapped near some black holes found in galaxies neighboring our own. (b) These photons are similar in several respects to Schumann resonant coherent photons trapped between Earth and its ionosphere (between 0 and 80 km altitude) except they have much longer wavelengths and much lower frequencies. The Schumann resonances have wavelengths of the size of Earth's circumference divided by small integers, n, whose wavelengths are approximately equal to 1/(10 n) times the Earth-Moon distance. (c) These photons produce observable results because of their large number and coherent nature, forming a Bose-Einstein condensate of spin-1 particles. The many electrons found in the hot plasma occupying the same region of space near the SBH are acted upon in coherent fashion, at a specific frequency, by the standing-wave photons. The effect, superposed upon the EM radiation emitted by the plasma electrons near the SBH, is detected at Earth. The results being reported here have been discovered during original research in General Relativity done by members of our ECU research group.	O10
Occurrence of changes in spiny dogfish male:female ratio in longline surveys in the Cape Cod area: management aspects, Andrea Dell'apa, Jennifer Cudney-Burch, Roger Rulifson, East Carolina University, Greenville, NC 27858 Observation by New England longline fishers, and results from past and ongoing research studies conducted by East Carolina University (Rulifson), provide support for daily sexual differences in habitat use between male and female spiny dogfish in the Cape Cod area and surrounding waters.	O11

We have observed this using commercial longlines in fall 2008 near Green Harbor, and again by longlines in fall 2010 near Chatham and off Stellwagon Banks. Gillnets have not shown this pattern. We present here result from a longline survey conducted off the coast of Chatham, southeast of Cape Cod. This survey is part of an ongoing project which was designed to assess migration patterns of spiny dogfish along the Northwest Atlantic coast. One of the study objectives is to test an hypothesis suggested by New England commercial longline fishers, that the male:female ratio in catches changes to mostly females as the day progresses. Our preliminary results for 11 October, 2010, show that this ratio change occurs, with an higher number of males in early morning, while an increasing number of adult females in later morning. Also, the average length of females increased as the day progresses, while male average length didn't significantly changed. If changes in the male:female ratio is consistent through day and season in specific locations, the possibility for a male-only directed longline fishery on a specific time and space scale framework could be considered for the implementation of spiny dogfish fishery regulation management in the study area. Avoiding fishing adult females, which are used as reference points for the determination of the spawning stock biomass (SSB), can provide direct benefits to the sustainability of the fishery targeting this species, which it is cause of concerns overseas in term of conservation and trade.	
Solvent-Controlled Switch of Selectivity between sp2 and sp3 C-H Bond Activation by Platinum (II), Dileep Atchyut Vezzu, Alex W Garner, Caleb F Harris, Robert D Pike, East Carolina University, Greenville, NC 27858 Cyclometalation reactions have been studied intensely for the past few decades, especially those containing palladium. The factors that control the process of the C-H bond activation, however, are not yet completely understood. C-H bonds are ever-present in organic molecules, but the vast majority of them cannot be exploited for chemical reactions due to their inert and stable nature. Early attempts to activate these bonds led to very complicated mixtures of products, and therefore not an acceptable means of C-H activation due to poor selectivity. Controlling the selectivity of a reaction is one of the most important issues surrounding synthetic chemistry. It is generally recognized that aromatic C-H bonds are more likely to undergo activation by platinum complexes, but in a recent study it has been illustrated that there is a delicate balance between sp2 and sp3 C-H bond activation in a platinum (II) complex system. This talk will discuss the solvent-controlled switch of selectivity between sp2 and sp3 C-H bond activation in platinum (II) complex systems. Ligands L1 through L3 were designed and synthesized to test the selectivity of cycloplatination of a reaction with potassium tetrachloroplatinate (II) in two different solvents, acetonitrile and glacial acetic acid. The mechanism of reaction will also be discussed.	O12

Use of otolith microchemistry as a method for inferring natal origins and migrations of adult river herring, Daniel Zapf, East Carolina University, Greenville, NC 27858 River herring stocks in North Carolina have been declining for more than 25 years. Important river herring spawning habitat must be identified to ensure that harvest moratoriums and other recovery efforts are successful. River herring are anadromous and evidence suggests they return to natal tributaries to spawn. Otolith microchemistry was used to investigate the degree to which adult river herring return to natal tributaries of the Albemarle Sound, NC to spawn. Adult River herring were collected from the Scuppernong River in 2009, and the Chowan and Perquimans Rivers in 2010. Elemental concentrations at the core of otoliths were measured with inductively coupled plasma mass spectrometry. Elemental concentrations were used to group fish by river of capture. Sr:Ca ratios were measured across the entire width of the otolith in order to infer migration history. Adult river herring were classified to the river in which they were captured with high accuracy. River herring of similar ages and origin showed variable lifetime migration patterns.	O13
Phylogeny of the Ecdysozoa inferred from all 13 complete mitochondrial protein sequences with emphasis on the arthropod superclass Myriapoda, Michael Brewer, Jason Bond, East Carolina University, Greenville, NC 27858 The relationships between the major clades within the animal superphylum Ecdysozoa, and its very existence, are contentious. The placement of the Panarthropoda as sister to the other chitinous, molting invertebrate phyla (Priapulida, Nematoda, Kinorhyncha, etc.) or the traditional sister phylum Annelida (=Spiralia) has been argued since the first evidence of an ecdysozoan clade. Within the Panarthropoda, a phylogeny of the Arthropoda has not been agreed upon. Recent evidence suggests the existence of the Pancrustacea (Hexapoda + Crustacea or a gradient of taxa), but the placement of the Myriapoda and Chelicerata are very much in doubt. Whether the myriapods are sister to the Chelicerata (=Paradoxopoda) or the Pancrustacea (=Mandibulata) has not been discerned. Herein, we examine all relationships mentioned above using full sequences of all 13 animal mitochondrial protein-coding regions. Site-specific models of molecular evolution are implemented along with recent, rapid Maximum Likelihood algorithms for phylogenetic inference. Additionally, the relationships between the diplopod (millipede) orders are noted. This work shows the usefulness of mitochondrial sequence data at deep levels. Future permutations of these analyses that include gene synteny information should further elucidate groupings that are difficult to interoperate presently.	O14

C. elegans oocytes cleave the protein synthesis factor eIF4G during germ cell apoptosis.
Andrew Friday, East Carolina University, Greenville, NC 27858

During apoptosis, general protein synthesis is reduced but the synthesis of cell death proteins is enhanced. In mammalian cells, selective translation has been attributed to disruptions to the protein synthesis machinery. Initiation factor eIF4G is cleaved by caspase-3 to suppress cap-dependent mRNA translation and induce a cap-independent mechanism. We have previously shown that disruption of the balance between cap-dependent and cap-independent C. elegans eIF4G isoforms (IFG-1 p170 and p130) promotes apoptosis in developing oocytes. Germ cell apoptosis was accompanied by the synthesis of the Apaf-1 homolog, CED-4.
We now demonstrate that *C. elegans* eIF4G (p170 and p130) are substrates for the worm apoptotic caspase, CED-3. Truncation of each eIF4G occurred at a single site. Recombinant CED-3 processed the eIF4Gs at a non-canonical motif, TTTD456, that was located 66 amino acids downstream of p130 start site.
To address whether eIF4G cleavage actually occurs in vivo in worms experiencing germ cell apoptosis, we utilized a strain with a temperature-sensitive mutation in the anti-apoptotic Bcl-2 gene (ced-9ts) and GFP-marked somatic sheath cells to monitor oocyte engulfment. Apoptosis was induced and subsequently monitored by fluorescent decoration of germ cell corpses in live worms. Western blotting demonstrated the extensive cleavage of eIF4G in Bcl-2 depleted worms. Independent loss-of-function *C. elegans* strains deficient in CED-3 (caspase-3) or CED-4 (Apaf-1) showed no germ cell apoptosis when depleted of eIF4G p170. Apaf-1/CED-4 promotes further eIF4G cleavage by CED-3 and an upregulation of cap-independent protein synthesis reinforces a positive feedback loop for apoptotic progression.
Together, these data suggest that both eIF4G isoforms are cleaved in *C. elegans* germ cells undergoing apoptosis and that the resulting shift to cap-independent translation initiation further favors synthesis of pro-apoptotic CED-4/APAF-1 to complete the process. Furthermore apoptosis induced by cap-independent conditions was caspase-3 and apoptosome dependent, suggesting a signaling role for protein synthesis. These findings support a new paradigm in which modal changes in protein synthesis may be required to initiate the cell death signal, rather than occur merely as downstream consequences of the apoptotic event.

O15

Efficient utilization of heme as an iron source in *Brucella abortus* requires the heme oxygenase, BhuO, Jenifer Ojeda, East Carolina University, Greenville, NC 27858 *Brucella abortus* is a Gram negative bacterium that resides within the cells of its host in order to evade part of the host immune response. Humans are an accidental host to B. abortus, and the brucellosis disease symptoms include fever, chills, headache, backache, weakness, and weight loss. *Brucella abortus* resides in the phagosomal compartment of the host macrophage where essential nutrients such as iron are limited. Within this niche, heme is a readily available source of iron for the brucellae due to the breakdown of red blood cells by the host macrophage. Heme transport in Gram negative bacteria begins with energy dependent transport through the outer membrane. The TonB/ExbB/ExbD energy coupling system provides the energy for this process. When heme is in the periplasm it is bound by a periplasmic binding protein that shuttles the heme though the periplasm to the appropriate inner membrane transporter. Efficient utilization of heme as an iron source requires the processing of heme in the cytoplasm and is primarily carried out by a heme oxygenase. Heme oxygenases have been previously characterized in several Gram positive and Gram negative bacteria. Like mammalian heme oxygenases, bacterial heme oxygenases facilitate the breakdown of heme into ferrous iron, carbon monoxide, and biliverdin. *Brucella melitensis* BmeII0706 has been shown to have heme oxygenase activity in vitro. The gene is also found in *Brucella abortus* 2308, and has been renamed bhuO. bhuO has been targeted for mutagenesis in *B. abortus* 2308 to evaluate the role of the Brucella BhuO protein in heme utilization and during pathogenesis. Experimental evidence suggests that major sources of iron in B. abortus can be obtained from the production and subsequent uptake of siderophores as well as from heme in vitro. In fact, a mutation in the bhuO gene causes the brucellae to produce more siderophores, suggesting a compensatory role for these iron uptake genes. While a mutation the bhuO gene shows little phenotypic difference from wild type in vitro, creating the same mutation in a siderophore mutant background reveals a striking iron starvation phenotype that cannot be relieved by the addition of heme. Also, the bhuO mutant is significantly attenuated in the mouse model of infection, suggesting a role for bhuO in the pathogenesis of B. abortus.	O16
Alternative mRNA forms for CED-4/Apaf-1 during apoptosis, J. Kaitlin Morrison, Vince Contreras, Enhui Hao, Brett D. Keiper, East Carolina University, Greenville, NC 27858 Apoptosis is the process by which superfluous cells are eliminated by committing themselves to suicide. A shift in protein synthesis, during this process, leads to an upregulation of cell death related proteins and a down regulation of proteins required for general cellular processes and cell cycle progression. This study focuses on protein synthesis and apoptosis in developing germ cells in *C. elegans*, a common model organism used in the study of apoptosis due to the conserved apoptotic	O17

signaling pathway. During apoptosis in human cells and in the *C. elegans* germline cells, caspase-3 (CED-3) is activated which cleaves the translation initiation factor eIF4G (IFG-1). This cleavage hinders growth-regulated translation by inhibiting mRNA cap recognition by eIF4E/eIF4G. However, some mRNA molecules have internal ribosome entry sites (IRESes) that allow eIF4G to recruit mRNAs to the ribosome via a cap-independent mechanism. ced-4 mRNA, unlike its mammalian homolog Apaf-1, an apoptosome protein, does not contain a 5-untranslated region of the mRNA in which it could contain an IRES sequence. However, ced-4 is part of a polycistronic mRNA containing upstream genes that is spliced into a mature mRNA. Alternative splicing of this intergenic region could allow for an upstream addition of untranslated sequence that could contain an IRES element. In this study we focus on characterization of this upstream region to investigate if alternative splicing leads to an extended 5-untranslated region with a putative IRES that is used for translation of CED-4 during the inhibition of cap-dependent translation machinery. Investigation of the intergenic sequence revealed several regions containing potential IRES elements. RTPCR has demonstrated that there are forms of a mature sliced message with additional 5-sequence. Preliminary mRNA mapping using RNase Protection has demonstrated that there is a mature SL2 spliced transcript and another protected transcript with at least 50 nt of additional upstream sequence. Together with our previous findings this data can provide for a new understanding of apoptotic protein upregulation that incorporates multiple Apaf-1/CED-4 mRNA splice variants and their utilization under the induced cap-independent (eIF4G) conditions.	
The gene encoding the outer membrane heme transporter BhuA is regulated at the post-transcriptional level by the RNA chaperone Hfq in *Brucella abortus* 2308, David Martinson, East Carolina University, Greenville, NC 27858 *Brucella abortus* is a Gram negative bacteria belonging to the alpha-proteobacteria group. *B. abortus* is an intracellular zoonotic pathogen causing a significant number of animal and human infections worldwide. During a *B. abortus* infection, the bacteria survive and replicate within the host macrophage in specialized compartments called Brucella-containing vacuoles. Like other bacterial pathogens, *B. abortus* must overcome the iron deprivation encountered in mammalian hosts, and experimental evidence suggests that heme serves as a critical iron source for the brucellae during their intracellular replication in host macrophages. BhuA is the TonB-dependent outer membrane transporter required for heme uptake in B. abortus 2308, and transcription of the corresponding gene (bhuA) is regulated in an iron-responsive manner by the iron responsive regulator Irr. Studies carried out in other bacteria indicate that the sRNA chaperone Hfq modulates expression levels of TonB-dependent outer membrane transport genes. Comparative analysis of the patterns of b-galactosidase production from a bhuA-lacZ translational fusion in B. abortus 2308 and an isogenic hfq mutant suggest that small regulatory RNAs (sRNAs) may also be playing a role in the regulation of bhuA expression. Electromobility shift assay experiments suggest Hfq directly	O18

binds to the bhuA mRNA indicate a direct interaction between Hfq and the 5-untranslated region of the bhuA mRNA resulting in post transcriptional regulation of bhuA in B. abortus 2308. Comparative Northern blot analysis using a probe for bhuA mRNA does not show an increase in bhuA mRNA levels between B. abortus 2308 and the isogenic hfq mutant. Our current model for expression of bhuA in B. abortus involves both transcription and post-transcriptional regulation. Under iron deplete conditions Irr promotes the efficient transcription of bhuA, however, Hfq and an unidentified sRNA appear to block translation of the bhuA transcript. We propose a second regulatory signal, such as the presence of exogenous heme is required for efficient translation of the bhuA transcript.	
Effects of electroporation assisted Photofrin mediated Photodynamic therapy, David Huffman, East Carolina University, Greenville, NC 27858 Many children treated for cancer experience cognitive late effects, including problems with attention and working memory, as a result of chemotherapy and/or radiation therapies. Very few empirically-supported treatments exist to address cognitive late effects, which can have significant effects on school and work performance as well as quality of life. Computer-based cognitive rehabilitation has been used with children to remediate attention problems and learning disabilities, both developmental and acquired. This project aims to assess the feasibility and effectiveness of a computer-based cognitive rehabilitation program in improving attention and working memory of pediatric cancer patients and survivors ages 6 to 20 years. Exclusion criteria include a history of head injury involving loss of consciousness or seizure disorder and non-native English speakers. Participants are administered an assessment battery consisting of well-validated measures of cognitive functioning to determine study eligibility (Full Scale IQ score > 65 and at least one impaired measure of attention or working memory) and to collect baseline data. Eligible participants proceed to the treatment phase, which consists of 15 one-hour computer-based cognitive rehabilitation sessions to be completed over a 5- to 8-week period. A software program called Captain's Log (BrainTrain) that is designed to improve attention, working memory and other cognitive skills is used for the cognitive rehabilitation sessions. The treatment sessions involved individual sessions 3- to 4- times per week with a trained "coach" who guides the participant through increasingly more difficulty video game-like activities. After completion of the training sessions, a post-treatment assessment to assess the effectiveness of the rehabilitation program will be completed. This study employs a single-case design with repeated measures. The participants are two adolescent males with acute lymphoblastic leukemia (ALL): a 12-year-old patient who is still in active treatment and a 19-year-old survivor who was diagnosed at age 3. Statistical analyses include Student's t-test comparisons using reliable change scores on pre- and post-assessment measures.	O19

Injury-regulated microRNAs 744 and 431 promote regenerative axon growth following sciatic nerve crush in mice, Di Wu, Elena Pak, East Carolina University, Greenville, NC 27858 MicroRNAs (miRNAs) are small, non-coding RNAs that regulate gene expression. Dysregulation of miRNAs have been implicated in many diseases including neurological disorders such as Alzheimer s disease and Parkinson s disease. The investigation of miRNAs expression and function has important implications for understanding the mechanism of disease and developing potential therapeutic interventions. Our previous work showed that peripheral nerve axons in vivo and in vitro contain functional miRNA machinery proteins that would respond to peripheral nerve injury. In addition, the deletion of Dicer, a key enzyme responsible for generation of miRNAs, would delay regenerative axon growth. These studies have indicated that miRNAs are likely to be important mediators of neuronal plasticity during peripheral nerve regeneration. In the current study, we hypothesized that some of the miRNAs may be key regulatory switches for peripheral axonal regeneration. A conditioning sciatic nerve lesion was performed on 8 week-old CD-1 male mice 5 days before the collection of dorsal root ganglia (DRG). MiRNA array data from injured versus naïve DRG neurons revealed a group of injury-regulated miRNAs. MiR-433 and miR-744, found to be highly up-regulated in DRG neurons following sciatic nerve crush in microarray,, were validated with real-time qPCR. To determine if these miRNAs could be the key regulators for peripheral axon growth, the gain and loss of function analyses for the chosen miRNAs were performed on DRG neuronal cultures by applying Pre-miR miRNA precursors and Anti-miR miRNA inhibitors. After 48 hours culture, neuronal cells and axons were visualized with antibodies against neuronal ²-tubulin. Comparison of axon length and the number of axon branches between miRNA precursors/inhibitors - treated groups and control groups revealed that miR-744 and miR-433 significantly promote axon growth. The treatment with miR-744 mimic enhanced the elongation of axon length by 30% and the branch numbers by 40%, and the treatment with miR-433 mimic resulted in an increase of axon length by 25%. Our observations provide further evidence in support of our hypothesis of miRNA involvement in peripheral nerve regeneration. MiR-431 and miR-744 could be promising candidates for the future miRNA based therapies that enhance the endogenous neuroregenerative or neuroprotective capacity.	O20
Mechanism of Pit-1-Dependent Growth Hormone Locus Control Region Activity, Tamra Hunsaker, Brian Shewchuk, East Carolina University, Greenville, NC 27858 The human growth hormone (hGH) gene cluster is regulated by a distal locus control region (LCR), located 15 to 32 kb upstream of the pituitary-specific hGH-N gene. A discrete region of the hGH LCR, DNaseI hypersensitive site I (HS I), is necessary and sufficient for high-level, position-independent and somatotrope-specific hGH-N expression in transgenic mouse pituitary somatotropes. The determinants of this activity bind the pituitary transcription factor Pit-1 in vitro, and mediate DNaseI hypersensitivity in this region and the establishment of a broad domain of	O21

histone acetylation at the hGH locus in transgenic mouse pituitary chromatin associated with hGH transgene activation. These findings suggest a model in which Pit-1 recruits a coactivator complex to the LCR that governs a chromatin modification mechanism vital to the transcriptional activation of the distal hGH-N gene. Consistent with this model, ectopic Pit-1 expression was sufficient for hGH locus histone acetylation and increased hGH-N transcription in heterologous cells. This activity is independent of the basal histone acetylation state at HSI, which supports a role for Pit-1 as a pioneer factor in the activation of the hGH locus. However, the order, causality and interdependence of these processes, the cofactors involved, and how the LCR and proximal hGH promoter cooperate remain open questions. Here we show that Brg1 colocalization with Pit-1 at the endogenous rGH locus in a rat somatotrope cell line results in corresponding reduction of Brg1 localization under shRNA(Pit-1) knockdown. Such endogenous cofactor interdependence supports previous findings that the putative Pit-1 elements at HSI recruit Brg1 in parallel with Pit-1 in vitro, suggesting that the targeting of a SWI/SNF-like nucleosome remodeling complex may be involved in HSI function. We also describe the development of a tri-stable ex vivo model employed to resolve, under time-course Pit-1 induction, the details of LCR-mediated processes in a physiological chromatin environment in cultured cells. Ongoing studies will seek to identify the order of proceedings occurring at the hGH locus by action of LCR determinants, and the role of these events in long-range hGH-N activation.	
Using Modulation Transfer Function for Characterizing Imaging Systems, Wenhuan Jiang, East Carolina University, Greenville, NC 27858 As a part of a long-term research program on diffraction imaging flow cytometer, we are developing a dual-polarization imaging system to acquire diffraction images of different polarization from flowing microsphere and cells. To compare different imaging system designs, we employ a method of modulation transfer function to characterize imaging systems. In this method, grating patterns of different spatial frequency are used as the objects to quantitatively measure the resolving capability of an imaging system. The imaging system consists of a microscope objective and a tube lens of different focal length. A 12 bit camera of 640x480 pixels is used to acquire images at the focal plane of the tube lens. A set of grating patterns with spatial period ranging from 1mm to 0.005mm is used to produce corresponding image of similar grating structures. From each acquired grating image of spatial frequency f, the grating patterns are analyzed to extract averaged Imax and Imin to calculate a parameter of contrast C = (Imax - Imin) / (Imax + Imin) as a function of f. The normalized contrast C as a function of f is termed as the modulation transfer function. We will present results to demonstrate how to characterize and optimize different designs of imaging systems using the modulation transfer function.	O22

Neutrophil Gelatinase-Associated Lipocalin - A Potential Role in Prostate Cancer Development and Progression, William Chappell, East Carolina University, Greenville, NC 27858 Prostate cancer is the second leading death causing cancer of men in the United States. Early stage tumors are often times successfully treatable with surgery and hormone/radiation therapy resulting in tumor remission. More advanced stages can breach the basement membrane of the prostate leading to tumor metastasis resulting in a cancer that is difficult to treat. This metastatic potential of prostate cancer is marked by the production of proteins necessary for cell detachment and the cell s ability to proliferate in an anchorage independent manner. Human neutrophil gelatinase-associated lipocalin (NGAL) is a secreted glycoprotein that was first purified from a complex with MMP-9 from neutrophil granules, where it was found to protect MMP-9 from autodegradation thereby decreasing its turnover rate, stabilizing its activity, and promoting tumor growth. Investigations of NGAL in malignant tissue exhibited an increase in expression levels of NGAL in various cancer tissue types including prostate. Using prostate cancer cell lines, our studies have suggested that NGAL may function to promote tumor growth and metastasis. Unlike some published reports in cell lines of other tissue types, NGAL expression levels do not appear to play a significant role in chemotherapeutic drug resistance in prostate cancer cell lines. Yet the presence of NGAL in prostate cancer cells does appear to promote anchorage independent growth which may be an important characteristic of a cancer stem cell. These studies along with other reports suggest that NGAL could potentially become a biomarker for disease progression and a possible target for chemotherapeutic intervention.	O23
Suppression of claudin-7 expression promotes cell proliferation and disrupts cell-matrix interactions in human lung cancer cells, Zhe Lu, Yan-Hua Chen Claudins are a family of tight junction (TJ) integral membrane proteins with at least 24 members in mammals. Reduced or altered expression of claudins has been reported in various human cancer tissues; however, their roles in cancers are largely unknown. Claudin-7 is a unique TJ protein in that it is not only localized at the apical TJs of epithelial cells, but also has a strong expression at the basolateral membrane. To study the function of claudin-7, we suppressed claudin-7 expression by lentivirus shRNA technology in a human lung adenocarcinoma cell line HCC827. Our study showed that claudin-7 knockdown (KD) cells displayed higher cell proliferation rate than the control cells. At the molecular level, the expression levels of phospho-MAPK, survivin, and phospho-BCL-2, which are cell survival and anti-apoptotic regulators, were all significantly upregulated in claudin-7 KD cells compared to that of control cells. More importantly, we found that depletion of claudin-7 also upregulated matrix metalloproteinase-3 (MMP-3) at both mRNA and protein levels. Real-time RT-PCR revealed that the transcription of several collagens, such as type V ±1, type XV ±1, and type XVI ±1, was dramatically decreased in claudin-7 KD cells compared to	O24

that of the control cells. In addition, integrin ²1, which serves as a collagen receptor, was also downregulated in claudin-7 KD cells. Consequently, when claudin-7 KD cells were plated on the uncoated glass surface, they were unable to attach to the glass and died the day after plating while the control cells adhered well and grew normally. This phenotype can be rescued by culturing the claudin-7 KD cells on either poly-D-lysine or collagen coated glass surface, suggesting that suppression of claudin-7 weakened the cell-matrix association. Thus, our current study highlights a novel non-TJ function of claudin-7 in maintaining epithelial cell-matrix interactions. We propose that suppression of claudin-7 reduced the production of extracellular matrix (ECM) proteins and disrupted cell-matrix interactions. The upregulation of MMP-3 by claudin-7 depletion accelerated the degradation of ECM proteins and contributed to the cell attachment defect in claudin-7 KD cells.	
Effects of Ketorolac (NSAID) on Vestibular and Auditory Evoked Potentials, Gary Gaines, Timothy Jones, East Carolina University, Greenville, NC 27858 The non-steroidal anti-inflammatory drug (NSAID) ketorolac (Toradol) is a candidate for use as a supplemental analgesic during major surgery in anesthetized rodents. The use of ketorolac during surgery is believed to reduce the anesthetic dose required to achieve and maintain an adequate surgical plane and thus improve the physiological conditions and survival of animals during long experimental procedures. Ketorolac has reported side effects of dizziness, "ear pain", hearing loss, tinnitus and vertigo in humans, but there has been no report of ketorolac s effect on the auditory and vestibular system in animal models. Thus the use of ketorolac during studies of the inner ear in anesthetized animals is subject to question. Our aim was to evaluate the effect of ketorolac on vestibular and auditory compound action potentials in the mouse (C57BL/6J). This was accomplished by recording linear vestibular sensory evoked potentials (VsEPs) and auditory brainstem responses (ABRs) during ketorolac administration. The effective analgesic dose range for ketorolac is reportedly 0.1 - 5 mg/kg with a lethal dose 50 (LD50) of 200 mg/kg (half-life ~3 hours). We evaluated the effect of ketorolac on VsEPs and ABRs during a series of doses (5 mg/kg, 10 mg/kg, 20 mg/kg, 40 mg/kg, 80 mg/kg) administered at 20 minute intervals in mice anesthetized (0.007ml/g) with a mixture of ketamine (18mg/ml)/ xylazine (2mg/ml). VsEP and ABR results for ketorolac were compared to those from a sham group receiving the same volume of Ringer's solution at the same intervals and a control group maintained under anesthesia for the same period. The peak amplitudes and peak latencies of control and sham groups were not significantly different with MANOVA analysis and were therefore grouped together for further analysis of controls versus drug effects. There were no significant differences between the peak amplitudes and peak latencies of the combined control group and the peak amplitudes and peak latencies of the ketorolac treatment group. Therefore, the amplitudes and latencies of VsEPs and ABRs were unaffected by ketorolac. These findings demonstrate that ketorolac can be used as an analgesic to supplement anesthesia in mice without concerns of modifying the linear VsEP and ABR. Supported by: NIH NIDCD 3 R01	O25

DC006443-04S1 (SMJ), Dept. of Communication Sciences and Disorders, East Carolina University	
A Putative Lrp/AsnC Transcriptional Regulator Directly Controls the Kynurenine Pathway in P. aeruginosa ,Claire Knoten, L. Lynn Hudson, James P. Coleman, John M Farrow III, East Carolina University, Greenville, NC 27858 Pseudomonas aeruginosa is an opportunistic pathogen that causes disease in the immunocompromised and those suffering from cystic fibrosis (CF). P. aeruginosa utilizes three known cell-to-cell signals that regulate up to 10% of its genome, including multiple virulence factors. One such signal is 2-heptyl-3-hydroxy-4-quinolone, also known as the Pseudomonas quinolone signal (PQS). PQS is synthesized by PqsABCDH from the precursor anthranilate, which is produced through two separate enzymatic pathways. The first pathway converts chorismate to anthranilate via the anthranilate synthase PhnAB. The second pathway, the kynurenine pathway, aerobically catabolizes tryptophan into anthranilate via three separate enzymes, encoded by kynA and kynBU. We have previously shown that the kynurenine pathway is a critical source for the production of anthranilate for PQS synthesis. The regulation of the kynurenine pathway was also suggested to be upregulated in the presence of kynurenine by an unknown transcriptional regulator. Gene PA2082 encodes a putative Lrp/AsnC type transcriptional regulator that is divergently transcribed from kynBU operon and is highly conserved in bacteria that harbor the kynurenine pathway. We have named gene PA2082 KynR. A mutation in kynR caused a significant decrease in PQS production and suggests that it plays a role in the biosynthetic route to PQS. When grown on L-tryptophan sole carbon source media, KynR is required for growth, an identical phenotype to mutations in kynABU. Furthermore, the upregulation of kynA and kynB transcriptional activity in response to kynurenine was completely abolished in a kynR mutant and suggests that KynR is required for the response to kynurenine. We also found that the kynurenine pathway genes are directly regulated by kynurenine due to the ability of KynR and kynurenine to increase the expression of kynB and kynA in E. coli. Native KynR was purified and able to bind kynA and kynB promoters during an electrophoretic mobility shift assay. Through the data presented, we propose that KynR directly regulates the kynurenine pathway genes. Understanding the regulation of each pathway is crucial to unraveling the biosynthetic route to anthranilate and, ultimately to the production of PQS.	O26

Biomechanical Correlates of Walking Velocity in Young Adults, Alexis Sidiropoulos, Patrick Rider, Aubrey Taylor, Steve Roseno, Tibor Hortobágyi, Paul DeVita, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Walking is a basic form of locomotion and walking velocity is a good predictor of human health with faster velocities indicating better health. While faster walking velocities have been attributed to overall increases in lower extremity joint torques and powers, the precise relationships of torque and power outputs at each joint to walking velocity remain elusive. We propose that these relationships are fundamental in developing effective training programs aimed at increasing walking velocity in older adults. As an effort to identify biomechanical correlates of walking velocity, we examined the relationships between maximum joint torques and powers in the lower extremities and gait velocity in young adults. We will determine these biomechanical factors in young adults as the 1st step in our work aimed at increasing walking velocity and improving health in the older population. The purpose of this study is to identify the relationships among maximum, sagittal plane hip, knee, and ankle joint torques and powers and walking velocity in young, healthy adults in order to identify biomechanical correlates associated with modulating walking velocity. Gait biomechanics were collected using 8 camera 3D motion capture and force platform systems. Twenty young healthy adults each walked at 20 speeds ranging from relatively slow to relatively fast. Maximum sagittal plane joint torques and powers derived through inverse dynamics were correlated to walking velocity.All maximum torques and powers were directly related to walking velocity. Maximum joint torques demonstrated a proximal to distal decrease in the strength of their relationships with walking velocity. In contrast, maximum joint powers were similarly related to walking velocity at each joint. Overall, mechanical output at the hip was the primary biomechanical correlate of walking velocity whereas mechanical output at the ankle was most weakly correlated to walking velocity. Although walking velocity in young, healthy adults was modulated by mechanical adjustments at all 3 major lower extremity joints, the mechanical output at the hip joint was most strongly associated with walking velocity. It remains to be seen if the associations are similar in healthy old adults and those with disability so that effective exercise programs can be designed to maintain or increase gait velocity in these populations.	O27
Linear and Rotational Baseball Batting and Effects on Bat Velocity, James Metzinger, Paul DeVita, Michael McNally, Tibor Hortobagyi, Patrick Rider, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Historical evidence suggests two fundamental batting strategies: linear and rotational. It is unknown if either strategy would afford a competitive edge in the form of greater bat and in turn ball velocity. The purpose of the study was to compare maximum bat velocity during linear and rotational batting	O28

techniques. Seven male, collegiate batters performed both swing styles and hit a baseball from a batting tee. COM displacement was larger in linear (26 ± 4.2cm) vs. rotational (15 ± 3.0cm) batting ($p<.001$).There was no significant difference in maximal bat velocity between the linear (37.65 ± 2.5 m/s) and rotational (37.65 ± 2.7 m/s) batting ($p>0.98$). Normalized to subject attributes, maximal bat velocity correlated with maximum angular velocity of the pelvis of ($r = 0.86$) and maximum angular velocity of the trunk ($r = 0.92$), but not with COM translation ($r = -0.13$). Two different batting strategies produced virtually identical maximal bat velocity, suggesting no competitive edge. Despite the emphasis on lateral displacement in linear batting, trunk rotational velocity was the primary correlate to bat velocity in both rotational and linear batting.	
Translation Initiation Factor eIF4G-1 Function during Apoptosis in Breast Cancer Cells,Whitney Crosson, Amber Blackwell, East Carolina University, Greenville, NC 27858 Cell proliferation and apoptosis are linked to specific gene expression events regulated by protein synthesis, which begins with the joining of various eukaryotic initiation factors (eIF) to mRNA and ribosomes to initiate translation. eIF4G-1 catalyzes two types of translation initiation. Cap-dependent translation requires eIF4E to bind a 5 -methylated mRNA cap and eIF4G-1 to facilitate recruitment and promotes translation of cell cycle and growth-related proteins. Cap-independent translation initiates internally through internal ribosome entry sites (IRES) and promotes translation of apoptotic mRNAs such as Apaf-1. We find that 5 isoforms and 8 variants of eIF4G-1 exist, each potentially forming a translation complex with differing activities. We hypothesized that the representation of eIF4G isoforms will vary, as will the predominant mode of translation initiation in tumor-forming breast cell lines vs. non-tumor-forming lines. However, when identification of eIF4G-1 isoform representation was determined in three breast carcinoma cell lines and one non-tumorigenic breast epithelium cell line, no such systematic change in individual isoforms was found. Using siRNAs we depleted eIF4G-1 isoforms in MCF7 cells and demonstrated induction of cap-independent translation from the Apaf-1 IRES indicating a shift towards pro-apoptotic protein synthesis. Likewise, eIF4G-1 depleted cells showed increased sensitivity to the chemotherapeutic drugs etoposide and cis-platin. We have now developed a novel dual fluorescence reporter containing the Apaf-1 IRES, or a viral IRES to assay the propensity of these cells toward cap-independent translation in vivo. Our preliminary results confirm the ability of this assay to measure the ratio of cap-dependent versus cap-independent initiation in single live cells as demonstrated by blue fluorescence or green fluorescence, respectively. We will next deplete eIF4G-1 isoforms in these cell lines, treat them with apoptotic drugs, and evaluate temporal shifts in their balance of cap-dependent to cap-independent synthesis, as well as specific utilization of the apoptotic IRES. By establishing the role of eIF4G-1 isoforms in pro-apoptotic protein synthesis, it may be possible to push a cell from proliferation to apoptosis by targeting certain isoforms.	O29

Comparing and contrasting the effects of exogenous and endogenous growth hormone on LNCaP prostate cancer cell function. Alena Nakonechnaya, Holly Jefferson, East Carolina University, Greenville, NC 27858 Human growth hormone (hGH) is a trophic anterior pituitary hormone that is strictly regulated at the endocrine level. Prostate cancer (PCa), the second leading cause of death in the US male population, expresses hGH and human growth hormone receptor (hGHR) RNA, suggesting an autocrine function in PCa, and the potential for growth promoting, survival, anti-apoptotic effects of such expression. To determine the relationship between hGH expression and PCa cell function, we overexpressed hGH in the LNCaP PCa cell line, and studied the resulting effects on cell migration, proliferation and survival. We found that exposure of LNCaP cells to exogenous hGH has a different effect on cell function than endogenous hGH. Wild type (WT) LNCaP cells increased their proliferation, motility and survival properties upon exposure to exogenous hGH. In contrast, LNCaP cells overexpressing hGH had decreased rates of cell proliferation, increased apoptotic rates and increased cell migration that was not affected by further stimulation with exogenous hGH. Investigation of key signaling pathways revealed that these changes were not due to hGH receptor up-regulation, but rather to differential activation of JAK2 kinase. Cell treatment with PI3K, MEK(1/2) and STAT5 inhibitors resulted in differential effects on cell proliferation, motility and survival in WT and hGH-overexpressing LNCaP cells. qRT-PCR array analysis of signaling pathway and transcription factor genes revealed transient fluctuation of these genes in response to exogenous hGH, whereas hGH-overexpressing clone showed stable down-regulation of survival and anti-apoptotic genes, and increased activation of motility-related genes. The latter was also supported by actin staining which showed actin reorganization in LNCaP-hGH clones, indicative of increased cell motility. These data suggest that hGH overexpression in LNCaP cells may lead to changes in signaling through hGH-hGHR system, which results in inhibition of one set of tumorigenic properties in these cells, and potentiation of others.	O30
Framework for the Verification of Google App Engine, William Jenkins, Puneet Sharma, East Carolina University, Greenville, NC 27858 This project is designed to verify the behavior of Google's App Engine APIs using different testing techniques like pair wise testing and base choice. App Engine is Google's cloud computing platform that is open for public development. For this we established methods for testing select APIs via a custom framework that supports test plugins. We use this approach in a case study with Google s App Engine platform. We built our framework as an App Engine application as it allows for us to have direct access to the APIs and to indirectly test the platform. We started our investigation using pairwise testing of Google's App Engine framework beginning with the URLFetch API. We have since expanded to include Blobstore and Multitenancy APIs	O31

which are each supported by their own plugins. Additionally, we have formalized a methodology from our experiences testing this system to one suited for testing other API intensive platforms. This tool accelerates and automates the testing of the various APIs and provides support for a wide range of testing methodologies and test cases. Our framework design has greatly accelerated testing and provided for parallel development due its modular nature. With each plugin acting as mini-program, they are empowered both in their minimalism and their directness to their testing target. Because only objects and variables referenced by tests are included designers can make more readable test plugins that are easier to maintain and adapt in the future. The project currently has few targeted APIs remaining to test. The currently supported APIs can be tested using a variety of different methodologies. Our overall goal is to provide a competent test suite that can be used both for testing for new bugs and for regression testing. Additionally, the test suite will eventually generate test cases for the user automatically without requiring the user to provide them. The framework itself has proven simple and robust but is currently undergoing alterations so that it can support our future goals. The various plugins are being developed in parallel to accelerate development while allowing for each plugin s development to benefit from the discoveries and improvements of the others.	
Process-based Software Defect Taxonomy ,Ali Asghary Karahroudy, East Carolina University, Greenville, NC 27858 Every year billions of dollars are lost in software industry due to the software defects. There are many instances of monumental software failures that have staggering losses up to and including the loss of human life. Defect prevention in early stages of software development life cycle is very cost effective, however, the more defect prevention processes are in place, the more costs will be imposed on the project budget. Therefore a very well balanced model is needed to fulfill both defect prevention and cost effectiveness. Current models like peer reviews, analysis tools, and different testing techniques catch different classes of defects at different points in the development cycle. Providing the justification that no existing model can be enough as a standalone model. Organizations are still asking how they can predict the quality of their software. Despite the substantial research effort over the last 30 years where different prediction models have been proposed. Complexity and size metrics have been used in an attempt to predict the number of defects a system will reveal in operation or testing. Reliability models have been developed to predict failure rates based on the expected operational usage profile of the system. The maturity of design and testing processes has been advanced as ways of reducing defects. Recently large complex multivariate statistical models have been produced in an attempt to find a single complexity metric	O32

that will account for defects. In this paper an overall analysis of existing defect taxonomies is presented also well defined process based taxonomy is carefully created and implemented using the existing defect taxonomies. Our study is focused on defects found based on the process in which they are found. These defects are selected based on the largest potential impact on the final product. The proposed model uses the existing models as a base and improves process control in those in order to prevent defects. A process improvement model is studied and outcomes are stated as an amendment to the other models.	
Predicting Software Faults, Aravind Alluri, V. Lakshmi Narasimhan, S. Ramasamy, East Carolina University, Greenville, NC 27858 Any new software that has been released to the market is prone to faults, whose detection and correction will chronically increase at the beginning and become stabilized at later stages. The time taken for this stabilization may range from a couple of weeks, months or years, based on the several factors such as, the size of the software, how well it has been developed and various compatibility issues, etc. Our research paper primarily discusses several statistical parameters such as, the average time taken for fault detection, the average time taken to resolve that fault and average number of fault resolvers needed to resolve those faults, etc. We have carried out this work by taking the Apache Tomcat 5.0 (a freeware) as an example to illustrate the above factors practically. From the analysis, a software development company can predict the number of faults and the number of fault resolvers (both testers and other human resources) needed to resolve the faults. One can also evaluate the probability of bug prevention by keeping track of the bugs that rise in general during the early stages of the software release; this improves the overall company standards and business for software development as the fault resolution can be carried out at a faster rate, thereby leading to better customer satisfaction. A fault tolerant system can eventually be evolved within a short span of time thereafter.	O34
Virtual Classroom, Sahar Bazargani, Troy West, East Carolina University, Greenville, NC 27858 Virtual classroom system records instructor s lectures and broadcasts them to the students. Students can watch the previously recorded or real-time lectures. This system has two main parts: AVR Server and AVR client. AVR Server is a C# windows application used by instructors to record lectures. The two most important parts of the Server application is the Whiteboard and PowerPoint Sections. The application records the instructor's notes that are written in the white board section during the lecture. The latest version of the AVR Server allows instructors to use Interactive whiteboards to record lecture notes off traditional whiteboards through a capture device. Virtual Classroom lets instructors to load their PowerPoint files in the application and use them in the lecture. During the lecture audio is recorded along with all the instructor's actions which are saved as a set of commands. With this method the amount of data to be transferred over the network is	O35

greatly reduced. The offline broadcast of the lectures, reads the commands and audio from a zipped file. In real-time broadcasting, the lecture commands are sent to the client directly from server. AVR client application is a windows application which includes a C# and a Unity3d part. Two main requirements led to the design of the 3D boards with 2 layers of textures in AVR: The need to show the instructor's writing on the white board and PowerPoints, and the ability to recall any pervious board to make changes. The top layer of the texture is clear with no colored pixels; the bottom layer is a static image. This allowed the top layer's pixels to be changed without changing the base image. Slides can be sent to the PowerPoint and white boards as images which form the base texture. To reduce the cost of dynamic change of the 3D boards, every other pixel from what was recorded is sent, and then the classroom interpolates the pixels between the two points. This was faster, instead of placing pixels one at a time and then sending the texture to the GPU each time groups of pixels could be sent. The C# section of the application, reads the lecture's commands from the lecture's zip file and convert them to messages which are understandable by the unity section.There are some script codes in the unity section to receive the messages from C# part of the system.	
The Journey of a Lifetime, Thea Johnson, East Carolina University, Greenville, NC 27858 Recent literacy pedagogy emphasizes skill development in an attempt to satisfy high stakes testing requirements, while losing sight of the significance of reading experiences and discussions. This article examines the current literature pertaining to both theory and practice of using dialogue in the literacy classroom to value the individual voice, harness language for student expression, encourage multiple perspectives and a tentative stance toward knowledge, flatten the traditional classroom hierarchy, and encourage dynamic learning. In addition, the article also advocates the vital practice of helping students empower themselves via the strategy of disconnecting from the texts they read. The perspectives and strategies described herein provide students an opportunity to interact meaningfully with texts, one another, and the world around them, allowing students to clarify their values, realize their strengths, and benefit from new perspectives in a way that dignifies their humanity.	O36
Trade Books in Elementary Education: Misconceptions in Science, Heather Wiles, East Carolina University, Greenville, NC 27858 Elementary pre-service teachers are typically required to take only a few science courses and are not likely to have the pedagogical content knowledge necessary to choose accurate science trade books. Incorporating trade books in the content areas is a method for integrating subjects and is a common practice among elementary teachers. Trade books can be used in a variety of teaching strategies including the 5E Learning Cycle, Know-Want to Learn-Learned (KWL) charts, direct instruction, questioning the author, and inquiry-based learning. The many opportunities for trade book inclusion make them practical textbook supplements.	O37

This study investigates the ability of pre-service elementary teachers to identify misconceptions in science trade book excerpts chosen by the researcher. Data sources include three book evaluations completed by two ECU professors, two audio-recorded interviews with an ECU professor in reading education and an ECU professor in science education, and approximately 100 student surveys completed online by students enrolled in SCIE 3216: Teaching Science in the Elementary School at a southeastern university. The survey has six sections; an informed consent document, three sections on selected children s book excerpts, two sections related to teaching resources, and basic demographic information. The book excerpt sections each consist of a book excerpt, link to a video of the researcher reading the book, and 4-5 follow-up questions. The survey information is quantitative and will be analyzed and described as such. Frequencies and percentages will be used to describe the study findings. Implications for the researcher, survey participants, professors, and the field of education will be addressed. If a large number of pre-service teachers indicate there is not a misconception in the books, then a link is missing between content knowledge and application. Professors of college students will have additional content to teach, while current elementary teachers could view this study as important to their own education. As a researcher, describing current pre-service teacher knowledge of science misconceptions will make me more aware of the content I am presenting and addressing science misconceptions in my elementary classroom.	
A Proposal to use Concept Maps and Vee Diagrams to Improve Learningin a Lecture-Lab Microbiology Course,Maurice Smith, East Carolina University, Greenville, NC 27858 Students often times fail to connect science course content and laboratory work. The separation in time and location between the lecture and lab components of a science course leaves students unable to connect the science concepts taught in lecture with investigations conducted in the laboratory. The disconnect between lecture and laboratory has given rise to problems in the microbiology laboratory course at East Carolina University. Biology and nursing majors enrolled in microbiology courses complain that lab and lecture components fail to cover the same material at the same time, which leads to confusion and frustration when students attempt to learn new material. To determine how confused and frustrated students were with the course material, five basic public-health-related questions were asked to gain insight into the understanding they bring to the microbiology course and their understanding of the material taught. The survey included questions such as ”What are bacteria?” along with other inquiries. From the preliminary data gathered, it is clear that many students lack an understanding of the some of the most basic concepts in microbiology. For example, when asked about bacteria, the majority of students stated that they were things that can make people sick. A review of the literature identified two distinct but complementary educational tools that instructors can use to bridge the lecture-laboratory gap and help students connect the microbiology concepts they are expected to learn with the investigations they complete in the laboratory, thereby helping them gain a firmer understanding of fundamental concepts in microbiology. The educational	O38

tools include the use of concept maps and Vee diagrams. These tools have been used in research to improve students' knowledge and understanding of core science concepts taught in college science courses. Data collection is in the early stages. The future aspirations of this study include using both the concept map and Vee diagrams in the laboratory course to promote improved student understanding. This study will also use different kinds of assessment tools throughout instruction to gauge whether the educational tools have been successful.	
Collaborating with stakeholders to develop surveys measuring the impacts of tourism and second home development in coastal communities, Whitney Knollenberg, Joseph Fridgen, Pat Long, Huili Hao, East Carolina University, Greenville, NC 27858 Tourism and its many impacts is typically viewed from the "eyes of the beholder" as either being generally positive, generally negative, or somewhere along a continuum of both, depending upon many factors. Areas that see intense tourism development, may also contend with high levels of second home development leading to absentee ownership, inflated housing costs, and changing demographics. Permanent residents and second home owners alike may be affected by tourism's impact on workforce issues, transportation access problems and environmental pressures. The Center for Sustainable Tourism at East Carolina University is conducting research assessing property owners (both permanent residents and second home owners) perceptions' of such impacts in four of North Carolina's coastal counties: Brunswick, Currituck, Dare, and Pender County. The results are intended to aid in effective decision-making that will contribute to the long term economic, environmental and socio-cultural sustainability of these communities. The survey instrument for these studies was designed to help developers, community planners, public officials and property owners understand and manage changes in their communities. In order for the data to be useful to stakeholders meetings were held with tourism officials, planners and Chambers of Commerce directors for each county. The objective of this particular presentation is to illustrate how the focus group process allowed for collaboration among researchers and stakeholders in the development of the survey. The meetings with stakeholders in each county included a tour of the county's tourism resources and in depth conversations regarding the area's tourism issues. Participants were asked to complete the survey and provide feedback on what could be improved. The qualitative data gathered from site visits and focus groups revealed there were issues such as the availability of sewer, resident's perceptions of sea level rise, and public parking that were not included in the survey. This qualitative feedback from site visits and focus groups was incorporated into the study's survey instruments. This will allow the study to serve as a tool for local decision makers to better understand the needs of different stakeholders in their communities.	O39
Community Hazard Mitigation: An Empirical Analysis of North Carolina Counties, Jingyuan Li, East Carolina University, Greenville, NC 27858	O40

Flooding events, including coastal, estuarine, and riverine floods, cause considerable losses to individuals and businesses in the United States. The National Flood Insurance Program (NFIP) has been successfully in helping flood victims get back on their feet. Prior studies, however, maintain that potential improvements to the program exist, such as more timely updates to Flood Insurance Rate Maps (FIRMs), the alleviation of repetitive losses for some parcels, and increasing premiums for some pre-FIRM policyholders. In order to motivate flood insurance purchase and promote increased flood hazard mitigation, the Community Rating System (CRS) credits 18 community floodplain management activities. FEMA classifies the portfolio of community flood management practices on a ten point scale, reflecting the overall level of mitigation. The CRS classification determines premium discounts for insurance purchases under the NFIP. Discounts range from five to 45 percent. Participation in the program, however, is low. As of January 2008, 1080 communities, representing only five percent of NFIP-eligible communities, had enrolled in the CRS. Many CRS hazard mitigation measures have elements of local public goods, as they provide community-wide benefits and individuals in the community are not excluded once they have been made available. Little empirical evidence exists, however, to shed light on what factors influence the establishment of local hazard mitigation projects. This study will examine the influence of physical, risk, and socioeconomic factors on community hazard mitigation decisions as reflected by CRS participation. One objective of this study is to provide such evidence through an examination of patterns in CRS participation across 100 counties in North Carolina from 2002 to 2008. The research will test a number of hypotheses previously offered to explain why some local governments adopt hazard mitigation but others do not. The results will forge a better understanding of community decision making under natural hazard risk on a national scale. Through an improved understanding of factors that motivate hazard mitigation, state governments and FEMA can better encourage participation in the CRS and similar voluntary, incentives-based programs in order to provide for better protection from flood hazard.	
The Effects of Prenatal Cocaine Exposure on Executive Functioning in Early Adolescence, Laura Daniels , Tamara Warner, Marylou Behnke, Fonda Eyler, East Carolina University, Greenville, NC 27858 Research on executive functioning in children with prenatal cocaine exposure (PCE) has yielded inconsistent results, with some studies showing poorer performance for children with PCE and others showing no group differences. Study of the effects of PCE on executive functioning has been limited to early and middle childhood. The frontal lobe and associated brain regions involved in executive functioning undergo extensive development during late childhood and adolescence. Questions remain about whether subtle negative effects of PCE become more evident with specialization of the brain regions involved in executive functioning. The purpose of the current study was to assess the effects of PCE on executive functioning in early adolescence. Participants (N = 251, mean age = 12.5 years) are predominantly African American (82%) youth living in rural	O42

communities and of lower socio-economic status (SES). Mothers were enrolled in a longitudinal study when they first entered prenatal care or presented for delivery. Cocaine users were identified by maternal history and urine specimens collected at two unanticipated times. Cocaine-using pregnant women were matched to a non-using comparison group on pregnancy risk, parity, race, and SES. The Stroop Color-Word Test (Stroop) was used to assess cognitive flexibility, inhibition, and focused attention. The Trail Making Test (TMT) provided a measure of processing speed, sequencing and shifting abilities. The Wisconsin Card Sorting Test (WCST) assessed sustained attention, shifting between cognitive sets, and hypothesis generating and testing. An abbreviated version of the Wechsler Intelligence Scale for Children, 4th Edition (WISC-IV) was used to assess general cognitive ability. Statistical analyses included group comparisons and multiple regression modeling. Other drug exposures, adjusted birth head circumference, and gender were controlled for in the regressions. No group differences were found between PCE and non-PCE youth on any of the measures of executive functioning or general cognitive ability. Tobacco exposure and adjusted head circumference were significant predictors of WISC-IV estimated Full Scale IQ scores. None of the models for predicting Stroop, TMT, or WCST scores were statistically significant. In this large sample, there was no evidence indicating that PCE predicts outcomes of executive functioning performance in early adolescence. As expected birth head circumference was associated with higher general cognitive ability and unexpectedly so was prenatal tobacco exposure. This study adds to a growing literature base demonstrating that PCE is does not have a direct effect on executive functioning or general cognitive ability.	

Using the ABCD Model for Asset Building and Community Development for Dropout Prevention in the Ayden School Community. Victoria Aeby, Richelle Smallwood, East Carolina University, Greenville, NC The Ayden School Community has a 35% dropout rate despite their community involvement with youth and efforts to create responsible, empowered young men and women. Generally, students live close to the school and the schools, elementary, middle, and high, are within walking distance of each other. Ironically, this close-knit community has a high crime rate with local youth committing crimes against their own community. Some of the community programs that are addressing the violence and poor school performance may be working in isolation without accessing community resources. Thus, this creates community division, particularly regarding race and socio-economic status. The purpose of this study is to map community assets and develop linkages among community resources for a stronger, unified effort to reduce school suspensions, academic failure, and dropout. By reviewing existing programs, identifying community resources, mapping assets, and illuminating potential partnerships, this may be one way to increase Aydens people power and to stimulate community engagement to effect change by using the existing assets and resources for dropout prevention. One program that attempts to address these dichotomies is the Straightway After-School Program where youth may have a supervised environment to do homework, receive tutoring, eat supper, and participate in groups. Masters of Social Work Interns assist the director with conducting the program by providing social work services, specifically life skills groups. In addition to working with the Straightway program, perhaps the MSW interns may serve as brokers to existing community resources through utilization of the ABCD model.	O43
The GATS and ECU: Globalization Hits Home. Therese Pennell, East Carolina University, Greenville, NC 27858 The General Agreement on Trade in Services (GATS) both facilitates globalization as well as is a product of globalization. What is GATS? Who will it affect? How does it work? Who stands to gain from it? These are all questions that this paper seeks to answer to clear up misconceptions and start a local dialogue on the issue. Is the economic environment that East Carolina University has found itself merely a product of the current recession or are there larger policies out there that is affecting the funding, or lack thereof, that the University receives? How the GATS work and connecting it to how public universities in the United States receive funding will be evaluated. Many of the signs that the GATS policies are affecting us here at home abound. How should ECU act towards this very globalizing threat to take advantage of the opportunities that the GATS holds and prepare for the tightening of federal funding that is sure to come. The GATS and ECU, globalization hits home.	O44
Physical Activity and Greenway Usage among Proximate and Non-Proximate Residents, Chip Davis, East Carolina University, Greenville, NC 27858	

Regular physical activity can reduce the risk of obesity and can help people live longer, healthier lives. One mechanism to increase physical activity and reduce the risk of obesity is to facilitate active living. Greenways can be used for active living purposes and can be seen as a strategy for physical activity promotion in a community. More research is needed to quantify the value of greenway development and the ability of greenways to increase physical activity levels in those living proximate to a greenway. The purpose of this study was to examine the relationship between physical activity levels and residential proximity to a greenway. Proximate was defined as one half mile or less and non-proximate was defined as one half to two miles to a greenway. In addition, the relationship between greenway proximity, overall physical activity levels, and social support were examined. Questionnaires were distributed to adults living within two miles of a greenway located in Greenville, North Carolina using mail and door to door administration. T-test analysis indicated that site-specific physical activity such as walking and vigorous physical activity (VPA) were related to greenway proximity. Correlation analysis indicated a relationship between social support and site-specific physical activity on the greenway. However, overall physical activity levels did not increase in respondents living proximate or non-proximate to a greenway. In conclusion, people who live proximate to a greenway potentially alter their physical activity with greenway usage instead of using other recreational amenities.	O45
Evaluating Group Climate and Interaction in an Intern Task Group, Melissa Valentine-Barrow, Tracy Carpenter-Aeby,Victor Aeby,Jaqueline Coleman-Carmon,Tori Aeby Group work is a routinely utilized in social work practice and intervention due to its economic value and evidence-based outcomes. Two practical considerations arise: (1) Some social work programs combine group skill development with family and community classes whereas other programs do not teach group work until the field education internships; and (2) group evaluations and outcomes are often omitted due to time and evaluation skill constraints. Thus, the dilemma is that almost one fourth of social work practice involves groups but little emphasis in education and training are devoted to it. The purpose of this study is to demonstrate group evaluation for a field education task group. Further, this study evaluates group dynamics, interactions, and climate for group development by examining the Group Process Recording form, Corey Group Members Evaluation of Group form, the MacKenzie Group Climate Scale Short Form, and sociograms with an intern group (N=8) composed of three BSWs, three MSWs, and two professors. The results indicated that group members assumed a more professional role, became more aware of their role within the group and appeared to become more aware of the attributes each contributes to the group as a whole. Moreover, group members who had previously worked primarily as individuals began functioning as a team following the task group, which was vital for this internship, a leadership and life skills academy for middle school utilizing group work.	O46

The impact of humor, distraction, and trait forgiveness on rumination regarding a past transgression, Julia Fondren[1], Doris G. Bazzini[2], Heather Littleton[1] [1]East Carolina University, Greenville, NC, [2]Appalachian State University Transgressions, such as making hurtful statements or disclosing personal information without permission, are an inevitable part of close relationships. The extent to which individuals are able to forgive loved ones for these transgressions is important for maintaining relationships. However, some individuals are more able to forgive than others (they vary in their trait forgiveness). Those who are more able to forgive may do so in part by distracting themselves from rumination (repetitive thoughts) about transgressions. The current study directly examined the impact of distraction on transgression-focused rumination. Two types of distraction were used - humorous material and pleasant imagery. Humorous distraction was evaluated given evidence that humor and anger are incompatible behaviors (Prerost, 1995). Thus, humorous material may be more effective at reducing rumination than other pleasant material. The study also assessed whether there was an interaction between trait forgiveness and distraction on rumination. Participants (n = 67) were instructed to write about a transgression they experienced in a close relationship and then were randomly assigned to watch either a humorous video, a pleasant/enjoyable video, or wait for a period of time (time-elapse condition) before completing measures assessing transgression-focused rumination and trait forgiveness. A median split was performed on the trait forgiveness measure to divide participants into high and low forgivers. There was no main effect of experimental condition (humorous video, pleasant video, time-elapse) on rumination. However, a significant interaction was found, such that there were no differences in rumination across conditions for low forgivers but high forgivers in both video conditions engaged in less rumination than those in the time-elapse group. Results support that for high forgivers, distraction is sufficient to interrupt rumination. For low forgivers, however, distraction alone was not sufficient for reducing rumination. Thus, it appears that high forgivers are able to use multiple strategies to reduce rumination. Low forgivers, by contrast, may require instruction in how to reduce their rumination. Future work should therefore focus on developing effective interventions to increase forgiveness and reduce rumination among those low in forgiveness.	O47
Women's Gender Schemas for OB-GYNs, Katherine Buck, East Carolina University, Greenville, NC 27858 Obstetrician-gynecologists (OB-GYNS) in the U.S. face rising malpractice rates, long hours and on-call schedules. As a result, there is an OB-GYN shortage with many areas having no or insufficient obstetric and gynecological care available. One overlooked factor that may be exacerbating the OB-GYN shortage is a sizable decline in men entering the field. The problem of sex imbalance may be occurring in part because men are being discouraged from specializing in OB-GYN due to concerns	O48

that women are not interested in seeing a male OB-GYN. Indeed, about 50% of women report a preference for a female OB-GYN. This preference could reflect that women hold schematic beliefs that female OB-GYNs are more likely than males to possess certain characteristics that make them better OB-GYNs. The two studies conducted for presentation investigated the content of women's schemas for male and female OB-GYNs and their impact on provider evaluation. In study one, 96 women were asked to describe the typical characteristics of a male or female OB-GYN and what happens during a typical provider visit. Results supported that male OB-GYNs were more likely to be described as awkward, and female OB-GYNs as easy to talk to, and knowledgeable. Visits to a male OB-GYN were also more likely to contain the use of a chaperone, and making small talk. Based on these results, male gender schema consistent and female gender schema consistent narratives of an OB-GYN visit were developed. Then, 126 women were randomly assigned to listen to two audio recording of fictional medical visits to male OB-GYNs or female OB-GYNs. In both conditions, one OB-GYN engaged in male schema consistent behavior and one in female schema consistent behavior. Results supported that providers who engaged in female schema consistent behavior were regarded more positively (i.e., had more positive attributes, had higher satisfaction ratings, and had higher ratings of likelihood to see again). In addition, females who engaged in male schema consistent behaviors were rated more negatively than males. These results support that women's schematic beliefs about male and female OB-GYNs may be influencing provider choice. Results suggested that women did not necessarily prefer female providers, but strongly preferred the behaviors and qualities they associated with female providers.	
"Way to Go!": The Effects of Tutoring on At-Risk Middle Schoolers, Albee Ongsuco, East Carolina University, Greenville, NC 27858 The purpose of this presentation is to introduce a tutoring program that promotes educational success in middle schoolers with behavioral difficulties and who are at-risk for academic failure. Middle school students who were referred to the school's Child Family Support Team for academic failure (N = 13) were given parental permission to participate in a school-based behavioral tutoring program. Tutors were college-age volunteers who were required to complete an 18 hour community service project (N = 7). The independent variable was the impact of the behavioral tutoring program, and the dependent variable was the students' number of discipline referrals and difference in grades from the first to second semester. The presentation will include the following features: the collaboration between the university and the school, the training elements of the program, the implementation procedures of the program, and the findings. Video clips of different aspects of the training sessions and the evaluation of the collaboration between the school and university will also be presented. Specific training elements include positive reinforcement techniques with verbal praise phrases such as "Way to go!" that were practiced within the training sessions. A behavioral checklist was also utilized to monitor students' progress within each training session. Challenging scenarios with students were also practiced with the tutors.	O49

Results include qualitative data, in the form of written exchanges among administrators, tutors, and tutees to demonstrate the impact of the tutoring program, and quantitative data, which consists of the number of discipline referrals and difference in grade scores before and after participation in the tutoring program. Attendees will gain information about promoting educational achievement in at-risk students through a tutoring program, which emphasizes data-driven procedures, positive reinforcement strategies, and inter-professional collaboration.	
Death of a Gangster: Nothing left but the violence, Christopher Stansbury, East Carolina University, Greenville, NC 27858 The gangster movie has progressed from the individual (Pretty Boy Floyd/Al Capone) to the collective (Godfather trilogy) to a somewhat new double protagonist approach (American Gangster). Throughout this evolution, a couple elements remain constant: the violent nature of the genre and the thirst for more from the American viewing public. As Worshow (1962) suggests, the gangster is the no to the Great American yes which is stamped so big over our official culture. There has even been a push toward movies where the villain receives sympathy from the audience and may prevail at the end. But has the gangster/noir genre run its course and left viewers simply with gratuitous violence and less of an understanding of consequences and reality? In this paper, I will explore some of the reasons Americans are drawn to the gangster style movies, how the character portrayals have transformed over the last century and seek to discover if viewers fully understand the ramifications of the violent acts.	O73
Web Design & Global Advocacy: Information design for international audiences to implement social change, Joseph Dawson, East Carolina University, Greenville, NC 27858 In recent years, corporations have begun to use the Internet not only as an e-commerce tool but as a platform to influence public policy. Corporations can influence societal change through the interaction of mutually defining ideas and alliances. Ideas about issues shape alliances, and strategic considerations of building and maintaining alliances in turn shape the ideas people adopt and seek to implement [Stone, 2002]. Special interest groups and nonprofits have been utilizing the Internet for years because of the relatively low cost involved, the speed of information dissemination, and access to a global audience. Corporations are finally catching on and utilizing the web for advocacy purposes. As technical communicators continue to engage in activities such as web design, it is important that they stay aware of the various trends in the field that can add tremendous value in the workplace. Utilizing data from a discourse analysis of a blog posts and websites of multinational companies, this article will discuss considerations that must be made for corporate activist websites designed for international audiences and focuses on three different dimensions: awareness for advocacy, mobilization to form community, and action/reaction to implement social change. This presentation provides a model for effective corporate activist websites designed to persuade decision makers	O50

across the globe as well as insights into effective textual design features in digital spaces for technical and professional communicators. This article also seeks to provide teachers of technical and professional communication with an avenue to discuss the intersections of international business and political discourses in technical communication and the web designer as advocate. **References** Stone, Deborah. 2002. Policy paradox. New York: W.W. Norton & Company.	
An analysis of the social and cultural dynamics of women's alternative naming use, Myleah Kerns, East Carolina University, Greenville, NC 27858 In much of western culture, people's first names are chosen by their parents or family members upon, or even before, their births. The first name is often a reflection of an ideal or another person's identity valued by the giver. Given names sometimes fail to reflect who that person is based on personality, culture, and self-identification; given names can be undesirable or have characteristics that seem to limit the named person (McDavid & Harari, 1966; Mehrabian & Piercy, 1992). Because of this, alternative names are often used and can totally replace one's given name in certain situations. Alternative names can be shortened versions or unconventional spellings of one's first name, or a name that seems to better 'fit' or describe the holder. It may also be more contemporary than one's first name. Alternative names can be bestowed upon or taken by a person, and they usually coincide with how or what the named person identifies. Using an alternative name into adulthood is often the result of an awareness of who one is or how she wants to be perceived by others. For example, traditionally female names Kitty, Chris, and Lei don't solicit the same reactions as Catherine, Christine, and ShaLeka. When and why women use alternative names can highlight how they view themselves contextually and how they perceive their own social and cultural identities. To better understand how women construct their social and cultural identities through their choices of alternative names, More than 70 women were surveyed about their use of alternative names. Respondents have reported that they regularly use an alternative name in a variety of situations - social, professional, familial, et cetera. I will identify trends among women's alternative name choice and usage, and the benefits and/or consequences participants define based on when and why women choose to identify themselves with alternative names or nicknames.	O51

Micro-writing , Critical Thinking, and the First-Year Student, Celestine Davis, East Carolina University, Greenville, NC 27858 While some traditionalists favor writing instruction that focus primarily on grammar and mechanics, I argue that engaging students as early as possible and as often as possible in activities that facilitate critical thinking is paramount to their development as academic writers. Theoretical concepts of two national curriculum reform movements, Writing Across the Curriculum and the Critical Thinking Movement in North America acknowledge the effectiveness of writing instruction as one of the most powerful avenues by which to increase critical knowledge. As composition theorists have begun to debate ways of making knowledge that would most benefit writers, micro-writing tasks such as free-writing and prompted writing are becoming more prevalent in the composition classroom. Both facilitate what Peter Elbow describes as intuitive and creative first order thinking that are free of the constraints of formalized writing assignments requiring the discipline of second order thinking (37). Elbow suggests that micro-writing tasks are effective for teaching critical thinking skills and admonishes educators who do not "see that the situation is not either/or, it's both/and… the more first order thinking, the more second order thinking, and vice versa" (40). Smagorinsky argues, "Most current theorists agree that instruction in essay form is insufficient and, according to some, counterproductive" (339). I will review research that answers: How does micro writing increase critical thinking skills? What are the best strategies, practices, and methods for micro-writing that will increase critical thinking skills leading to better student writing?	O52

Graduate Poster Abstracts	ID #
HTLV-1 Viral Protein HBZ Inhibits Histone Acetyltransferase Activity of the Cellular Coactivators p300/CBP, Diana Wright, East Carolina University, Greenville, NC 27858 HTLV-1 is a retrovirus that causes Adult T-cell Leukemia (ATL), an abnormal proliferation of the infected CD4+ T-cells. HBZ, an HTLV-1 viral protein, is uniquely transcribed from the antisense mRNA of the provirus and is the only viral protein consistently expressed in ATL cells. HBZ has an N-terminal activation domain and a basic and leucine zipper region (bZIP domain) in the C-terminal. Our laboratory previously reported that the activation domain of HBZ interacts with the cellular coactivators p300 and CBP, and more specifically with the KIX domain of these proteins. These coactivators are required for viral and cellular transcription. The interaction between HBZ and p300/CBP allow HBZ to sequester them away from the viral promoter and inhibits viral transcription. Recently, we additionally found that HBZ interacts with the histone acetyltransferase (HAT) domain of p300/CBP. The HAT domain is important for relaxing the histone tails of chromatin through acetylation and recruiting cellular transcription factors and RNA Polymerase II to cellular promoters, as well as altering or increasing functionality of cellular proteins. We have determined that HBZ inhibits the activity of p300 using in vitro HAT assays with histones as the substrate. Interestingly, the bZIP region alone has a stronger inhibitory effect than the full-length protein, pinpointing the bZIP domain as the cause of the inhibition. We also show that HBZ inhibits p300-mediated acetylation of another protein, p65, which is a member of the NF-kB family. This experiment demonstrates that HBZ-inhibition of p300 HAT activity is not simply substrate-specific, and this may elucidate the possible mechanism of binding, interaction, and inhibition. Through immunofluorescence we show that HBZ inhibits p300 HAT activity in vivo as well. The inhibitory effect of HBZ on the HAT activity of p300/CBP could be important for the deregulation of cellular gene expression observed in diseases associated with HTLV-1.	P1
Multiplex Profiling Demonstrates That Circulating Adipokines are Related to Insulin Sensitivity but not BMI, Joseph R. Pierce[1], Raymond M. Kraus[1], Joseph A. Houmard[1,] William E. Kraus[2], Charles J. Tanner[1,] Myung Dong Choi[1], Robert C. Hickner[1] [1]East Carolina University, Greenville, NC [2]Duke University Medical Center, Durham, NC Increased adiposity is suggested to be functionally linked to insulin resistance through a low-grade pro-inflammatory state; yet, secreted cytokines from adipose tissue (adipokines) and specific relationships with body composition and insulin resistance remain to be elucidated. **PURPOSE:** To further examine relationships between circulating adipokines, BMI, and insulin sensitivity (IS), with IS assessed via minimal modeling and relevant adipokines via multiplexed profiling. **METHODS:**	P2

Overnight fasted men and women (n=25; 51 ± 6 yr) underwent a 3-hr intravenous glucose tolerance test (IVGTT), subsequently yielding an IS index (S_I). Comparisons of circulating adipokines (IL-1β, TNF-α, MCP-1, Resistin, and Adiponectin) were performed on basal blood draws before the IVGTT using a multiplexed Luminex assay. To examine the effects of body composition on adipokine profiles, volunteers were split into Lean and Obese BMI classes (BMI $\leq$ 27.2 and $\geq$ 33.5 $kg*m^{-2}$, respectively). To examine how IS could potentially be mediated by circulating adipokines irrespective of BMI, Low and High S_I tertiles were examined ($S_I \leq 3.88$ and ≥ 6.34 $mU*L^{-1}*min^{-1}$, respectively). Comparisons between stratified groups were made using unpaired t-tests, and correlations among adipokines and either BMI or S_I were performed using Pearson correlation. Data are mean ± SD, and α-level was set at $p \leq 0.05$. **RESULTS:** There were no differences in any circulating adipokines between the two BMI classes (all $p > 0.05$). Further, no significant correlations were observed between BMI and circulating adipokines ($p > 0.05$). However, when we examined differences in adipokines between the Low and High tertiles of S_I, circulating adiponectin was higher in the High S_I tertile (Low S_I: 15.87 ± 5.30 vs. High S_I: 30.42 ± 10.30 $\mu g*mL^{-1}$, $p < 0.01$). Moreover, unlike BMI, S_I was positively associated with both adiponectin ($r = 0.54$, $p < 0.01$) and MCP-1 ($r = 0.60$, $p < 0.05$). **CONCLUSIONS:** Although previous data suggest that adipokines are secreted from adipose tissue, these findings suggest that BMI may not be the best indicator of circulating adipokine profiles, as it appears that increased circulating adipokines may be more functionally related to insulin sensitivity instead. **Acknowledgments**: Funding support provided by NHLBI Grant R01 HL-57354 and NIDDK Grant R01 DK-071081.	
Bioengineering cartilage to study anabolic and catabolic metabolism of genetically modified cells. Ben Danielson, East Carolina University, Greenville, NC 27858 Osteoarthritis is a debilitating disease that is recognized anatomically by the loss of cartilage located on the ends of articulating long bones. One of the first events observed in early osteoarthritis is the reduction of proteoglycan content; a structural component of the extracellular matrix in cartilage. The study of this phenomenon using genetically modified cells has been widespread, but also incomplete. These cells, termed chondrocytes, have traditionally been observed in cell culture models, thus excluding study of interactions taking place within the extracellular matrix. In order to investigate proteoglycan turnover in a more tissue-like environment, complete with cells embedded in an extracellular matrix, it becomes necessary to develop an ex vivo tissue model. The purpose of this study was to develop a "cartilage-like" tissue (neocartilage) generated using cells (some with specific gene modifications) pre-grown and expanded in vitro. In the current work, two different bioengineering approaches were used to establish neocartilage culture model systems. Both systems are being tested for responsiveness to growth factors known to modify matrix metabolism of cartilage. Two cell types were examined for their capacity to regenerate a functional neocartilage; primary bovine articular chondrocytes and rat chondrosarcoma chondrocytes. The isolated cells were grown initially as 3D cultures within alginate beads for periods up to 2 weeks. Alginate-recovered cells were then cultured as a multilayer tissue in Millipore filter inserts or as pellet	P3

cultures in conical tubes, each for varying culture periods. Cell viability was examined in both culture phases using a fluorescent live/dead cell assay. Resulting neocartilage discs and pellet spheres were characterized histologically and compared against each other as well as intact bovine articular cartilage explants using cartilage specific stains (safranin-O / fast green). Ongoing studies will examine the effect of additional serum or growth factors (e.g., BMP7 or IGF1) to enhance neocartilage formation. Once a sustainable tissue-like model is established, the cultures will be challenged in an effort to determine the role CD44, a cell surface receptor for hyaluronan, in the turnover of proteoglycan in the extracellular matrix.	
Characterization of DNA Polymerase Delta (´) using a combined in vivo and in vitro strategy, Chad Hunter, Lena Keller, East Carolina University, Greenville, NC 27858 Cancer can be caused by defects in the regulation of DNA replication. Abnormal DNA replication can lead to unregulated growth, failure to differentiate, and aberrations in chromosome biology. Numerous different proteins are involved in DNA replication and understanding the role of these proteins is essential in understanding the nature of cancer. Of these different proteins involved in DNA replication, one of the most important is DNA Polymerase Delta (´). DNA Polymerase ´ is involved in elongation of the lagging strand of DNA during the S phase of the cell cycle. Interestingly, little work has been done in multicellular organisms with regards to DNA Polymerase ´. Using two novel mutant fly strains along with cell culture, we show that mutations in DNA Polymerase ´ have effects on genome stability. The work employs a three-pronged approach consisting of an interaction analysis, a genetic analysis and a knockdown analysis in tissue culture. The interaction analysis was conducted using a yeast two hybrid system to confirm predicted interactions from humans. Interactions investigated include but are not limited to: DNA Polymerase Alpha, members of the GINS complex, Mcm10, members of the MCM complex, and PCNA. The genetic analysis of DNA Polymerase ´ consisted of using two novel mutant fly strains. Both homozygous lethal, missense mutations were found to be located in a conserved polymerase domain (G694N) and a conserved exonuclease domain (C496Y). These lines were assayed for any abnormalities in cell cycle progression using both mitotic indexes and EdU incorporation as well as for any chromosome aberrations. The knockdown of DNA Polymerase ´ in tissue culture was used to corroborate and extend the in vivo work. S2 cells were utilized in RNA interference studies to analyze effects on cell cycle progression as well as any morphological changes that might occur in cells or chromosomes. Understanding how DNA Polymerase ´ functions in vivo will help us to understand the further understand the role of DNA replication in the context of a multi-cellular organism.	P4

Ethanol Attenuation of Peripheral NMDAR-mediated Pressor Response, Marie McGee, Abdel Abdel-Rahman, Department of Pharmacology and Toxicology, East Carolina University, Greenville, NC 27858 Ethanol alters NMDAR signaling based on type of exposure. With clear dependence of ethanol actions on central NMDAR signaling, studies on the unexplored interaction between ethanol and peripheral cardiovascular NMDAR are warranted. These studies tested the hypothesis that ethanol blockade of peripheral NMDAR results in attenuation of NMDA-evoked pressor response and vascular ROS and NOS-derived NO generation in conscious male Sprague Dawley rats. Femoral vessels were catheterized 2 days prior to drug injections. Four groups (n=5-6) of conscious male rats received the vehicle or the following drug treatment: 1) Saline, 2) NMDA (125,250,500 & 1000 µg/kg), 3) Ethanol (1g/kg) or 4) Ethanol + NMDA. Ethanol or its vehicle (water) was administered by gavage 30 min prior to bolus i.v injections of NMDA or saline. Ethanol alone did not produce any change in blood pressure. However, ethanol pretreatment caused downward shift in the dose-pressor response curve constructed with systemic NMDA. The pressor response elicited by bolus i.v. NMDA was short lived (approx 5 min). Therefore, it was also important to investigate the interaction between ethanol and vascular NMDAR signaling during sustained activation of peripheral NMDAR. Four groups (n=5) were used as follows: 1) Control 2) Saline + NMDA 3) Ethanol 4) Ethanol (1g/kg) + NMDA. Ethanol (1 g/kg) or its vehicle (saline or water) were administered 30 min prior to NMDA infusion or its vehicle (saline). NMDA (20 mg/ml, 9µl/min) was infused for a period of 30 min. Ethanol attenuated the sustained NMDA pressor response during the entire 30 min of NMDA infusion. Blood samples were collected at baseline and every 15 min thereafter until the end of the experiment to determine blood ethanol concentrations and for nitrite/nitrate and ROS biochemical assays in ethanol-treated rats in absence or presence of NMDA. Vascular (aorta) and cardiac tissues were collected at the end of each experiment for biochemical assays. These molecular and biochemical studies are currently being conducted. This research is funded by NIH grant AA07839.	P5
Real-time reactive oxygen species (ROS) measurements in isolated human subcutaneous adipose tissue preadipocytes, Artie Rogers, Jacques Robidoux, East Carolina University, Greenville, NC 27858 The rate of mitochondrial superoxide generation occurs within seconds making it a challenge to measure such short lived events. Although fluorescent microscopy, microplate, and flow cytometry based methods have been used to measure changes in ROS levels, there are several hurdles that prevent mitochondrial superoxide or hydrogen peroxide measurements during this short time frame. To resolve this issue, we used a new generation of flow cytometers, the Accuri C6, to monitor superoxide generation in a cell by cell basis for at least 100 minutes at a 0.01 second resolution. Human preadipocytes were preloaded with the mitochondrial superoxide indicator, MitoSox red.	P6

Preadipocytes were lifted non-enzymatically from the dish and transferred in Krebs buffer containing 4% BSA. Real-time measurements indicated that a proportion of free fatty acid (FFA) treated cells show a rapid increase (less than a minute) in mitochondrial superoxide. After 40 minutes the majority of cells displayed a ten-fold increase in fluorescence. Pre-treatment for 10 minutes with N-Acetyl Cysteine, an antioxidant, followed by FFA treatment prevented the increase in MitoSox fluorescence confirming our method was indeed measuring mitochondrial ROS production. With the new generation of cytometers, real time measurement of ROS, specifically superoxide, becomes extremely accessible and accurate, while providing extensive and valuable data regarding population dynamics.	
Altered Vascular Reactivity Following Exposure to Multi-Walled Carbon Nanotubes Increases Risk for Cardiac Injury, Leslie Thompson, Chad R. Frasier, Ruben C. Sloan, Erin E. Mann, Ben Harrison, David A. Brown, Jared M. Brown, Christopher J. Wingard, East Carolina University, Greenville, NC 27858 The unique physicochemical properties of multi-walled carbon nanotubes (MWCNT) present potential risks to physiological systems. We report here that an acute pulmonary instillation of MWCNT negatively impacts coronary flow (4.9 ± 0.6 ml/min/g vs. 6.8 ± 0.6 ml/min/g in vehicles) during reperfusion of isolated rat hearts subjected to global ischemia/reperfusion (I/R) injury. We hypothesized that MWCNT exposure blunts relaxation responses of vascular tissues. Male Sprague-Dawley rats were exposed to 100 µg of MWCNT suspended in 10% surfactant/saline (10%SS) or the vehicle only. 24 hours later, segments of the left anterior descending (LAD) coronary and thoracic aorta were mounted on a multi-myograph system. The segments were subjected to cumulative doses of acetylcholine (ACH), sodium nitroprusside (SNP), serotonin (5-HT), or endothelin 1 (ET-1). The LAD constrictor responses of the MWCNT group generated a greater magnitude of active stress (mN/mm2) to ET-1 (4.03 ± 0.41 vs. 2.62 ± 0.23) and 5-HT (3.76 ± 1.20 vs. 0.88 ± 0.34) compared to vehicle. Hillslope comparisons between groups revealed depressed aortic responses to ACH (-0.69 ± 0.23 vs. -1.95 ± 0.23) and ET-1 (1.08 ± 0.09 vs. 1.74 ± 0.21) in the MWCNT group. From these data we conclude that an acute exposure to MWCNT can be deleterious to vascular reactivity and increases risks for cardiac injury. Supported by NIH ES019311 (JMB) & ES016246 (CJW).	P7

Living with and Amongst HIV/AIDS in Ethiopia: Individual Spirituality and the Response of the Religious Community, Ashley Mabina, Nicole Jacobs, East Carolina University, Greenville, NC 27858 Spirituality in healthcare has become an important area of research as physicians are finding that it may play a role in an individual's health, thus contributing to their identity, coping mechanisms, and decisions about their medical management. Researching a disease with the expected clinical detriment such as HIV/AIDs in Ethiopia, a religious and culturally rich area, allows many opportunities to further explore this role of spirituality in healthcare. We hypothesized that religion/spirituality may play a significant role in an individual s interpretation of HIV. Individuals living with HIV/AIDS were asked 22 interview questions regarding the role that their individual spirituality plays in their overall health and well-being. Religious leaders answered 9 questions regarding the HIV/AIDS situation in their community. Participants were found from an organization called Dawn of Hope as well as local churches. Of the 21 participants living with HIV/AIDS, all admitted to believing in a higher being, 11 of the PLWHA were of the Protestant Faith and 10 were Orthodox Christians. One hundred percent of the participants believed that prayer or some other spiritual practice could heal HIV. Among the practices mentioned included prayer, baptism or holy water, and meditation, in addition to maintaining appropriate medical treatment. From the Catholic, Muslim, and Orthodox affiliations, all religious leaders shared a common belief that they are in a position that gives them the ability to change the HIV related stigma. From the results, it can be concluded that spirituality does play a role in the lives of individuals living with HIV/AIDS. Spirituality proved to serve as a coping mechanism for each of the participants that were interviewed. In comparison, the religious leaders also felt that they played a role in educating individuals about the disease and providing support for individuals actually living with HIV/AIDs. Study results are not representative of all religious affiliations and this topic should be further studied to expand on current results that support a correlation between spirituality and HIV/AIDS.	P8
The Impact of Hygiene-Related Skin Problems in Burma (Myanmar), Kay Khine, Maria Clay, East Carolina University, Greenville, NC 27858 Burma (Myanmar), located in Southeast Asia, is one of the poorest countries in the world. As a developing country, hygiene is not a priority for most citizens in the society; as a result, skin infections are prevalent and have medical and psychosocial impacts on individuals. Perceptions and coping mechanisms of skin infections vary between the rich and the poor in Burma. In Rangoon (Yangon), semi-structured interviews were conducted with thirty Burmese citizens, ages 18 and over. Two fifteen member groups were divided based on the living standard of having water system installed at home as compared to using public water outlets. The presence or lack of a water system was used as a proxy for dividing subjects between upper and lower living standards without having to ask income. Maximum variation sampling was used to parallel diverse impacts of hygienic skin	P9

infection. Domain analysis was conducted through a phenomenological method revealing divergence themes between the two groups related to: self-reported health status, factors determining where individuals seek treatment, water resources, hygiene products, diagnoses relating to skin and their causes, disfiguration concern, beliefs on individual duty to prevent transmission of skin problems, and the social impact of skin infections in daily life. The study also revealed similarities between the two groups on family structure and its impact on the treatment of infected individuals. The study showed the effect of different living standards on medical and psychosocial dimensions of skin infection among Burmese citizens. Further investigation should include larger samples in other areas of the country.	
AMP kinase/PK-A crosstalk in vascular smooth muscle, Joshua Stone, Avinash Narine, East Carolina University, Greenville, NC 27858 Aberrant vascular smooth (VSM) growth is pivotal in the pathophysiology of vascular disease. We previously reported that the cyclic AMP/PK-A system has capacity to attenuate growth of serum-stimulated rat A7R5 VSM cells (VSMCs). Our current data suggest that activation of the metabolic sensor adenosine monophosphate-activated protein kinase (AMPK) has a significant inhibitory effect on VSM growth. Interestingly, these anti-growth effects were truncated by inhibition of cyclic AMP-dependent protein kinase (PK-A). Therefore, in the current study we hypothesize that regulatory crosstalk occurs between the AMPK and cyclic AMP/PK-A systems in VSMC. Incubation of rat primary VSMCs with the AMPK activator AICAR significantly increased phosphorylation of both a catalytic Thr172 site and a proposed PK-A-inhibitory Ser485 residue on AMPK. Concomitantly, we observed an increase in AMPK activity shown by both phosphorylation of the downstream target Acetyl CoA Carboxylase (ACC) at Ser80 and an AMPK activity assay. This increase in AMPK activity was observed by direct stimulation with AICAR as well as stimulation with the cAMP agonist Forskolin. Furthermore, activity was completely abridged by both the AMPK and PKA inhibitors Compound C (CC) and PKI, respectively, suggesting that PK-A integrally communicates AMPK in VSMCs. AICAR also induced CC- and PKI-inhibitable PK-A activation measured by phosphorylation of a suggested PK-A specific Thr157 residue on vasodilator-stimulated phosphoprotein (VASP) and a PK-A activity assay. Interestingly, this activity was inappreciable compared to the observed PK-A induced activation of AMPK suggesting AMPK may act downstream of PK-A and a possible feedback threshold may exist influencing AMPK-mediated activation of PK-A. On a functional level, preliminary flow cytometry data show that AMPK inhibits cell cycle progression from G0/G1 corresponding to reduced VSMC proliferation, and AMPK also reduced PDGF-^{2}-stimulated VSMC migration using a modified transwell system. These provocative findings reveal a discrete nexus between AMPK and PK-A in VSM that may be capable of reducing vascular growth and lend credence for a potential metabolic target for quelling abnormal VSM growth.	P10

Initial Characterization of Programmed Cell Death in Pseudomonas aeruginosa, Kyle Tipton, East Carolina University, Greenville, NC 27858 *Pseudomonas aeruginosa* is a gram negative, mono-flagellated bacterium. *P. aeruginosa* is also an opportunistic pathogen that is especially problematic for those with cystic fibrosis and burn wounds. A characteristic of this organism is its ability to grow in an extraordinarily diverse range of environments where essential nutrients vary from soil to deionized water. In order to keep a viable population when nutrients become scarce the organism employs a programmed cell death function similar to eukaryotic apoptosis. We believe that this programmed cell death process is controlled by a set of opposing proteins called CidA and LrgA which belong to a family of proteins called holins. Holins were first characterized in bacteriophage as the mechanism for timing of progeny phage release and host cell lysis. Interestingly, most bacteria encode holin homologues for purposes that have only been theorized. The definite functions of these proteins are not known, but it is speculated that they could be involved in daughter cell septation, peptidoglycan remodeling, and/or the aforementioned programmed cell death. We present here preliminary results investigating putative holins as a facilitator of programmed cell death in *P. aeruginosa*. We constructed a CidA expression vector and saw a drastic growth defect when overexpressed in either Escherichia coli or P. aeruginosa. This effect can be seen in broth culture or on solid media. However, overexpression of LrgA does not produce a growth defect but greatly alters the pH of the media. CidA has been found to be maximally expressed in mid- to late-stationary phase as assessed by a cidA promoter-^{2}-galactosidase fusion. This expression was only minimal in different types of rich media but in Vogel-Bonner minimal media, expression was continuously increased from 12 hours through 196 hours. These data suggest that the holin/antiholin system is responsive to nutrient conditions and also may allow for sacrifice of weaker individuals to keep a population viable under stressful conditions.	P11
Parallel Increases In Energy Expenditure And Muscle Activation While Performing Clerical Work In Three Body Postures, Caitlin Pearl, Patrick Rider, Paul DeVita, Tibor Hortobagyi, Olivia Ratcliff, Jennifer Streeter, East Carolina University, Greenville, NC 27858 One cause for weight gain may be due to the increase in sedentary time leading to reduced energy expenditure, especially in the workplace. A potential advantage of performing clerical work in different postures such as standing or sitting on a therapy ball includes a slow accumulation of increased energy expenditure throughout the day. Presumably an increase in muscle activation causes the increase in energy cost while performing clerical work standing or sitting on a therapy ball but this hypothesis has not been tested. The purpose of this study was to determine the increase in passive energy expenditure and muscle activation during clerical work while sitting on a therapy ball and standing compared to sitting on a chair. Five young subjects copied a typed document using a computer under 3 randomized conditions: sitting on a chair, sitting on a therapy ball, and standing. Muscle activation in 2 upper extremity muscles, 4 lower extremity muscles, and 2 trunk	P12

muscles, in addition to passive energy expenditure were recorded for 15 minutes during each condition. A basal measurement was taken while lying down for 15 minutes. Quality of typing was calculated by assessing correct word count. Average VO2 while lying down was 3.40±0.53 ml/kg/min. Average VO2 while sitting on a therapy ball while typing, sitting on a chair while typing, and standing while typing were 4.57 ±SD 1.02 ml/kg/min, 4.40±.88 ml/kg/min, and 4.29±0.58 ml/kg/min, respectively. Average EMG in 8 muscles while lying down was 0.007±.001 mV. Average EMG across 8 muscles while sitting on a therapy ball, sitting on a chair, and standing while typing were 0.034±.009 mV, 0.032±.006 mV, and .032±.012 mV, respectively. Increase in EMG activity explained about 30% of variance in increase in VO2. Average words per minute for each condition was 46.5±12.4 in the chair, 48.5±9.7 on the therapy ball, and 49.6±12.5 while standing. These preliminary data seem to suggest that there is a parallel and moderately correlated increase in energy expenditure and muscle activation while performing clerical work in non-standard postures. Performing clerical work while sitting on a therapy ball or while standing for periods of time may help in closing the expended energy gap usually seen with weight gain without reducing the quality of clerical work.	
EFFECT OF REPEATED UNILATERAL ECCENTRIC AND CONCENTRIC EXERCISE ON SPINAL EXCITABILITY IN THE CONTRALATERAL HOMOLOGOUS PLANTARFLEXORS, Ryan Hill, Binal Motawar, Mike McNally, Patrick Rider, Paul DeVita, Tibor Hortobagyi, East Carolina University, Greenville, NC 27858 It is well established that unilateral muscle contractions can produce strength gains in the non-exercised contralateral homologous muscle, or cross education. Cross education tends to be greater during eccentric contractions, when the muscle is actively lengthening, compared with concentric contractions when the muscle is actively shortening. The mechanisms behind the strength gains of cross education are less clear. The purpose of this study was to compare spinal excitability in the resting right plantarflexors before, during, and after bouts of unilateral eccentric and concentric contractions of the left plantarflexors. We hypothesized that unilateral plantarflexion facilitates spinal excitability in the resting contralateral plantar flexors, and the facilitation will be task-specific according to the type of muscle contraction. Subjects participated in two exercise treatments, eccentric and concentric, separated by 10 min of rest. Each treatment consisted of 5 sets of 10 repetitions, with 120 s of rest between sets. During the protocol, H-reflexes were evoked during each contraction over the exercise bouts, every 5 s for 120 s in the between-set rest periods, and every 5 s for 120 s during the follow-up after the 5th exercise bout. Against expectations, spinal excitability decreased ~20% relative to baseline during each of the 5 exercise bouts and returned, in each bout, to baseline in ~30-35 s after each contractions. In addition, this recovery to baseline was extended in the follow-up so that spinal excitability actually became facilitated and increased ~20% relative to baseline. The data suggest that the somatotopic organization of spinal excitability is more complex than previously thought. First, during muscle contraction there is a strong inhibition of spinal excitability on the contralateral side. This inhibition is probably not task (contraction) specific.	P13

Second, the inhibition during contraction reverts to facilitation over 30s of rest between bouts. The recovery of depression to facilitation seems to be task (contraction) specific, with more facilitation after concentric contractions. Finally, the facilitation is long-lasting because it is still present 4 minutes after the last contraction and more so, again, after concentric contractions. Overall, it is unclear if spinal plasticity contributes to cross education.	
Coactivation of Antagonist Hamstring Muscles During Maximal Effort Knee Extension, Robert Brady, Tessa Cook, Paul DeVita, Patrick Rider, Tibor Hortobágyi, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Coactivation, or the simultaneous contraction of both the agonist and antagonist muscle during a contraction either concentric, eccentric, or isometric, is a mechanism used to increase joint stiffness leading to increased stability. Traditionally coactivation is measured as a ratio using EMG to quantify the amount of coactivation. Previous literature suggests that due to lower levels of coactivation based on EMG trained people invoke less coactivation compared to their sedentary counterparts. However, coactivation may be more accurately understood using muscle torque ratios because the primary outcome of coactivation, increased joint stability is a mechanical not neurological phenomenon. Using previously developed models we plan to investigate the distinct torques produced by both the agonist and antagonist muscles during maximal concentric contraction to better understand antagonist muscle force production. The purpose of the current study is to compare hamstring muscle coactivation during maximal effort knee extension between college aged trained, and sedentary individuals based on differences in both EMG ratios and muscle torque ratios. EMG for two knee extensor muscles (VL, VM) and two knee flexor muscles (BF, ST) and net knee extensor torque were recorded during maximal effort knee extension at 30 degrees per second on a dynamometer in trained (they regularly perform resistance training on the lower extremety for the past 6 months) or sedentary (no lower extremity exercise) subjects. EMG data were analyzed to determine coactivation ratios (agonist/antagonist). Quadriceps and hamstring torque were determined using a previously developed neuro-mechanical model. Trained individuals showed less coactivation based on EMG however the mechanical output showed increased coactivation for trained individuals. As expected, trained subjects produced greater net knee extensor torque and lower antagonist/agonist EMG coactivation ratios. However, when agonist and antagonist torques were calculated the ratio of antagonist to agonist torque was greater in trained vs. sedentary individuals. Trained individuals may not suffer a reduction in knee joint stability due to the increased force per unit EMG of trained muscle. Given this new information, based on mechanical output trained people actually show greater levels of coactivation than sedentary	P14

Introduction of a Visuomotor Task to Standard Weight Training: A Laboratory Demonstration of a New Model of Resistance Training in Humans, Jeffery Morgan, Stanislaw Solnik[1], Steve Wiggins, Bill Churchwell, Patrick Rider, Paul DeVita, Tibor Hortobágyi, Department of Sport Science, East Carolina University, Greenville, NC 27858
[1]Department of Kinesiology, Faculty of Physiotherapy, University of Physical Education, Wrocław, Poland

Conventional resistance training consists of repetitive and invariant movements in terms of direction and velocity while overcoming an external load. Magnetic brain stimulation and imaging studies have revealed that short-term resistance training evokes neurological changes within the motor cortex. An abundance of evidence exists that unloaded motor skill training involving complex variations in both time and position improves skilled motor output through increases in cortical excitability. These observations together, raise the possibility that the repeated practice of a motor skill with variations in position and velocity under a loaded condition may accentuate neural adaptations and lead to a greater motor output.
Methods: The proposed model combines motor skill training with a load used during traditional resistance training. The motor skill training consists of a biofeedback controlled visuomotor task in which the user pursues a target pathway. During the demonstration, an electronic goniometer will be affixed to the volunteers elbow. They will visually track a cursor, controlled by flexing and extending the elbow, along a complex target-template displayed on a computer monitor. The task is to match as accurately as possible the path of the cursor with the target line of the template. The visuomotor task is combined with a load recommended for traditional strength training (~60-80% maximal voluntary contraction) to increase the intensity while retaining the complexity of the flexion-extension movement of the elbow. We are currently conducting studies to determine if visuomotor training with a load compared to conventional resistance training would produce greater improvements in movement variability, movement accuracy, and maximal voluntary force as well as possible changes in agonist and antagonist co-activation in the trained and un-trained arm.
Application: The positional control model can also be adapted to a force-feedback control. These control types could be used in post-operative or stroke rehabilitation to assist in proprioceptive and muscle coordination deficiencies. Healthy populations may benefit in an increase in motor performance and the model could be developed into an in-home fitness trainer for use with video gaming platforms.

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N-3 polyunsaturated fatty acids primarily affect lipid rafts in vivo. Benjamin Rockett, Heather Teague, Saame Shaikh, Andrew Franklin, Mitchel Harris, East Carolina University, Greenville, NC 27858 The primary bioactive components of fish oil are the n-3 polyunsaturated fatty acids (PUFA) eicosapentaenoic (EPA) and docosahexaenoic (DHA) acid which have immunosuppressive effects. A potential mechanism of action for immunosuppression involves these unique fatty acids manipulating plasma membrane organization. We have previously shown, in vitro, that n-3 PUFA acyl chains can disrupt lipid rafts, cholesterol/sphingolipid rich ordered regions of the plasma membrane. However, in this study we first tested the hypothesis that n-3 PUFA treatment can also disrupt non-raft organization. EPA and DHA overnight treatment markedly increased binding of a non-raft probe, FAST-DiI, in EL4 cells. FRET microscopy also revealed that the distance between non-raft molecules was increased at the nanometer scale. Unexpectedly, cell size was increased under these conditions. When cell sized was unchanged, non-raft organization was not affected by n-3 PUFA treatment. To translate these in vitro findings to a whole animal, we fed mice a n-3 PUFA diet. Here we found that plasma membrane lipid rafts in B cells were disrupted, visualized by confocal and TIRF imaging, while non-rafts were unaffected. This suggested, while a large percentage of n-3 PUFAs will localize to non-rafts, the major structural impact to membrane organization by n-3 PUFAs in physiological conditions may be limited to just lipid rafts in antigen presenting cells. Understanding the mechanisms through which n-3 PUFAs exert immunosuppression will aid in dietary recommendations and potential treatments for chronic inflammatory disorders.	P16
A possible role of the spinal autonomic system in the dopaminergic modulation of the monosynaptic stretch reflex, Tracy Johnson, Stefan Clemens Department of Physiology, East Carolina University, Greenville, NC 27858 Descending dopamine (DA) projections from the brain modulate motoneuron function in the lumbar spinal cord. Recent evidence suggests the existence of electrical gap junctions between motoneurons and the intermediolateral nucleus (IML) in the thoracic cord, but the functional role of this connection between autonomic and somatic circuits was not addressed. Using electrophysiological and pharmacological approaches in the isolated in vitro mouse spinal cord, we tested the responses of the monosynaptic reflex (MSR) to DA and D2-like receptor ligands in the presence or absence of the spinal autonomic system. Spinal cords from male and female mice (P5-14) were harvested and exposed in a Petri dish filled with artificial cerebral-spinal solution, and suction electrodes were attached at dorsal and matching ventral roots of thoracic, lumbar, or sacral segments. MSRs were evoked by current stimulation of the dorsal roots (200-500 μA, 100-500 μs, intervals of 30-60 s) amplified, recorded, and digitized	P17

for later analysis. Drugs and control solutions were bath-applied for periods of 30-60 minutes. We found that the D2-like receptor agonist bromocriptine (10 µM) mimicked in the lumbar segments the responses previously observed with DA, but increased MSR in IML-containing segments (thoracic and sacral). In contrast, the highly specific D2-receptor antagonist raclopride (10 µM) had opposite effects, leading to a decrease in MSR in IML-containing spinal segments, and an increase in MSR in the lumbar segments without an IML. Additionally, blocking gap junctions with carbenoloxone led to loss of the differential response observed in the IML-containing segments. Our data indicate that the spinal autonomic system has an important modulatory control over the MSR, and they suggest that the actions of the IML on motoneurons are similar in the sympathetic or parasympathetic systems of the spinal cord. We are currently exploring the functional role of the IML/motoneuron connection as well as implications on physiological changes that may occur following spinal cord injury.	
Characterizing the role of Psf2 in maintaining genomic integrity, Jeffrey Chmielewski, Laura Henderson, East Carolina University, Greenville, NC 27858 In D. melanogaster, the CMG complex is a group of proteins that function as the DNA helicase during replication. The CMG is composed of cdc45, MCM2-7, and the GINS complex. The GINS complex is a heterotetrameric complex composed of the protein subunits Psf1, Psf2, Psf3, and Sld5. Recent research in human dermal fibroblasts shows GINS is essential for the initiation and elongation stages of chromosomal replication. My primary hypothesis is that proper dosage of Psf2 is necessary to maintain genomic integrity, and there may be an interaction between Psf2 and Chk2 (loki) modulating DNA replication. Working with null mutations in Psf2 and Chk2, both separately and in combination, I have designed a series of experiments aimed at elucidating the function of Psf2. We are using DNA fiber analysis to determine if reduced expression of Psf2 alters the rate of the replication fork. In addition to DNA fiber analysis, we are investigating if reduced expression of Psf2 increases the incidences of ^{3}H2AX foci, which could be indicative of Chk2 activation. Our lab has previously shown that the null mutation of Psf2 is homozygous lethal, we also have evidence of reduced viability in flies heterozygous for the null mutation. We are using acridine orange staining to determine if this reduced viability in flies heterozygous for the null mutation is a consequence of an increase in apoptosis.	P18
Morphological Correlates of Gravity Receptor Functional Aging in CBA/CaJ Mice, Jessica Pierce, Sarath Vijayakumar, Sherri M. Jones, East Carolina University, Greenville, NC 27858 Cdh23ahl (Ahl) is a genetic mutation located on mouse chromosome 10 that affects Cadherin23, a protein critical to sensory transduction. Ahl predicts age-related hearing loss; however, it may not predict vestibular functional aging. We are currently assessing vestibular functional and structural aging, and hypothesized that morphological aging of vestibular structures correlate with gravity	P19

receptor function as measured by vestibular evoked potentials (VsEPs). To test this hypothesis, we quantified hair cells, synaptic ribbons, and post-synaptic receptor sites in the utricle of CBA/CaJ mice (6, 12, and 22 months of age, n = 4 to 6 specimens per age), and correlated the structural data with functional VsEP data from previous studies. CBA/CaJ mice have no known genetic mutations affecting the inner ear and serve as an aging control model. Utricles were dissected and stained with CtBP2 (a marker for synaptic ribbons and hair cell nuclei) and Shank1a (a protein located within the post-synaptic density). Specimens were then imaged with a Zeiss LSM 510 confocal microscope. The number of hair cells, synaptic ribbons, and post-synaptic receptor sites were quantified and averaged for four distinct areas (~2300 µm2) across each epithelium. The number of hair cells was similar at 6 (73.45 ± 3.16) and 12 months (77.22 ± 4.65), but declined significantly by 22 months (56.54 ± 5.89). The number of CtBP2 per hair cell declined significantly from 6 (5.24 ± 0.51) to 12 months (3.74 ± 0.39) and from 12 to 22 months (2.14 ± 0.53). Shank1a also declined significantly between 6 (7.11 ± 1.36) and 12 months (4.47 ± 0.85), but not between 12 and 22 months (3.39 ± 0.39). CtBP2 and Shank1a counts per hair cell were significantly correlated with VsEP thresholds in that the number of synaptic ribbons and post-synaptic receptor sites per hair cell declined as VsEP thresholds became significantly elevated with age. Results suggest that gravity receptor functional decline with age is associated with an age related decline in synaptic and neural elements. This research was supported by NIH R01 DC006443 and DC006443-04S1.	
Tumor necrosis factor-± induces immediate onset of mitochondrial dysfunction in HL-1 cardiomyocytes and human heart tissue, Taylor Mattox, Alan Kypson, Evelio Rodregiuez, Ethan Anderson, Kathleen Thayne, East Carolina University, Greenville, NC 27858 The mechanisms by which elevation of inflammatory cytokines, such as tumor necrosis factor-±, cause heart failure in patients with septicemia and toxic shock are poorly understood. We propose that mitochondrial dysfunction may be a mechanism whereby TNF± exerts its rapid effects on the heart. To address this we measured the effect of 10 and 30 min TNF± exposure on mitochondrial respiration in HL-1 cardiomyocytes and intact muscle strips of right atrium from patients undergoing coronary artery bypass graft surgery. A TNF± incubation (5ng/mL/10 min) in HL-1c significantly decreased ADP-stimulated respiration supported by complex I substrates pyruvate/malate (PM, -46.5%), complex I+II substrates PM and succinate (PMS, -46.1%), and complex II substrate (S) alone (-36.4%) versus untreated cells. In human cardiac tissue, significant decreases in ADP-stimulated respiration supported by all substrates were seen following 5ng/mL/10 min TNF± (-30.8% PM, -23.8% PMS, and -33.7% S, versus untreated tissue) and were sustained following a 30 min incubation (-43.0% PM, -27.5% PMS, and -28.0% S). These findings are the first to demonstrate the impact of TNF± on mitochondrial function in human heart tissue and suggest that rapid onset of mitochondrial dysfunction may contribute to heart failure caused by TNF± during septicemia and toxic shock. Research was sponsored in part by grant HL098780 (E.J.A, A.P.K) from NIH.	P20

Whole body fat oxidation is not tightly coupled to subcutaneous abdominal adipose lipolytic rate over 24 hours. Kathleen Gavin[1], Wendolyn Gozansky[2], Kazunori Ohkawara[3], Audrey Bergouignan[3], Robert C. Hickner[4,5], Edward L. Melanson[3], [1]Department of Exercise and Sport Science, East Carolina University, Greenville, NC, [2]Division of geriatric Medicine, [3]Division of Endocrinology, Diabetes, and Metabolism, University of Colorado Anschutz Medical Campus, Aurora, CO, It is well-known that whole-body fat oxidation is coupled with plasma free fatty acid (FFA) availability, and that subcutaneous abdominal adipose tissue (SCAAT) is a major source of plasma FFA. However, it is not known whether changes in whole body fat oxidation rate are tightly coupled to SCAAT lipolytic rates, particularly over the course of a 24-hour period. PURPOSE: To perform a pilot study to obtaining simultaneous measurements of SCAAT lipolysis using microdialysis and whole-body fat oxidation using a whole-room calorimeter. METHODS: Four healthy adults (3 female, 1 male) were studied in the calorimeter over a 24 hour period. Prior to entering the calorimeter, microdialysis probes were inserted in the SCAAT, and an indwelling catheter was inserted into the antecubital vein for measurement of circulating substrates and hormones. Subjects consumed three meals and performed a standardized physical activity protocol to mimic typical free-living activity. In addition, subjects performed 1 hour (11am-12pm) of stationary cycling at ~50% of maximal aerobic capacity. Dialysate glycerol concentrations were used as an index of SCAAT lipolysis. Blood and dialysate were obtained hourly during the waking hours, once during sleep, and the following morning. RESULTS: There was a significant negative association between hourly respiratory exchange ratio (RER) values and both plasma FFA ($R2=0.341$, $p<0.001$) and plasma glycerol concentrations ($R2= 0.239$, $p<0.001$). There was a significant positive association between RER and plasma insulin concentrations ($R2=0.175$, $p=0.001$). However, there was no association between hourly RER values and dialysate glycerol ($R2=0.014$, $p=0.359$, 2.0¼l/min flow rate). Hourly RER was also not associated with plasma glucose concentrations ($R2=0.051$, $p=0.076$). CONCLUSION: We conclude that changes in whole body fat oxidation during a normal day are closely related to changes in plasma FFA availability and not necessarily to SCAAT lipolytic rates. This suggests that although subcutaneous adipose tissue provides FFA to the circulation, lipolysis in subcutaneous abdominal adipose tissue during non-fasting conditions is not tightly regulated by signals from muscle or other tissues resulting from alterations in fat oxidation.	P21
Oxygen Induced Resistance to Tert-butyl Hydroperoxide in *Bacteroides fragilis*, Michael Betteken, C.J. Smith, East Carolina University, Greenville, NC 27858 *Bacteroides fragilis*, an obligate anaerobe, is one of the most commonly isolated organisms from anaerobic infections in humans. Infections from *B. fragilis* can result in complications such as abdominal abscesses, perforated and gangrenous appendicitis, skin and soft tissue infections,	P22

endocarditis and bacteremia. In order to cause infection, *B. fragilis* must adhere, resist increased oxygen tension, and express a variety of different virulence factors. The increased oxygen tension presents a large challenge for the survival of the anaerobic *B. fragilis*. Another challenge for *B. fragilis* is the oxidative burst that is generated from the human immune response. Exposure to peroxides such as tert-butyl hydroperoxide and cumen hydroperoxide mimic similar conditions that *B. fragilis* may encounter during oxidative burst. Resistance to these peroxides is mediated in several different ways but is most commonly associated with a peroxide specific peroxidase. For example, the ohr gene in Pseudomonas aeruginosa encodes a thiol peroxidase that mediates detoxification of tert-butyl hydroperoxide. There is no known ohr homolog present in the *B. fragilis* genome however resistance to high concentration of tert-butyl peroxide (55mM) has been shown following aerobic exposure. Disk inhibition assays have shown that when *B. fragilis* is exposed to a lethal concentration of tert-butyl hydroperoxide, in the presence of oxygen, there is no inhibition of growth. Yet when the assay is performed under anaerobic conditions a growth inhibition occurs. Taken together it is believed that oxygen and potentially peroxide damage induces a response that allows *B. fragilis* to survive lethal concentrations of peroxide. Identification of the genes involved in the induction of this resistance would better help to understand the physiological changes that occur in *B. fragilis* during infection.	
Chronic MOG-Induced Atypical EAE in the Lewis Rat: A Novel Encephalitogen and A New Model for Neurodegenerative Disease, Alan Curtis, Derek Abbott, Ashtom Thomasson, East Carolina University, Greenville, NC 27858 Multiple Sclerosis (MS) is an inflammatory demyelinating disease of the central nervous system and is characterized by focal inflammatory lesions together with demyelinating plaques in periventricular and perivascular regions of CNS white matter. The chronic inflammatory insult against CNS myelin results in neurodegeneration with neuronal loss and gross brain atrophy. Experimental autoimmune encephalomyelitis (EAE) is an extensively studied rodent model of MS which can be readily induced in Lewis rats by a single immunization of myelin basic protein (MBP) or encephalitogenic peptides of MBP in Complete Freund's Adjuvant (CFA). This form of EAE is characterized by a monophasic disease course marked by 3-5 days of flaccid tail and hind-limb paralysis followed by complete spontaneous remission and motor recovery. In contrast, MBP emulsified in Incomplete Freunds Adjuvant (IFA) does not cause EAE. Myelin oligodendrocyte glycoprotein (MOG) is also a constituent of myelin, and causes EAE in rodents when emulsified in CFA. Immunization of Lewis rats with MOG in CFA causes a mild monophasic form of EAE. The results of this study revealed a novel model of chronic atypical EAE in Lewis rats. Atypical EAE was marked by unusual clinical signs such as forelimb weakness without hindlimb involvement, ataxia without flaccid paralysis of the tail, and/ or vertigo/ disequilibrium and torticollis. Lewis rats were immunized with the major encephalitogenic peptide of MBP and the recombinant extracellular domain of rat myelin oligodendrocyte glycoprotein (IgV-MOG) in CFA. After recovery from monophasic EAE, the rats were boosted with MOG in IFA. This booster resulted in the induction of chronic atypical EAE that persisted in several rats without recovery. A primary immunization of	P23

MOG in CFA followed by a secondary boost with MOG in IFA was sufficient for induction of chronic atypical EAE. In contrast, GP69-88 was invariably associated with induction of classical EAE. We also tested a novel fusion protein comprised of the extracellular Ig-like domain of MOG (IgV MOG) and the cross-reactive encephalitogenic epitope of neurofilament-M (IgV-MOG-NFM). Rats immunized with IgV-MOG in IFA did not show chronic EAE, but a booster immunization with IgV-MOG-NFM in IFA elicited in chronic-progressive atypical EAE. In conclusion, we derived the first model of atypical EAE in the Lewis rat and provided preliminary evidence that this disease can be induced without CFA.	
Ten Days of Exercise Improves Skeletal Muscle Lipid Oxidation Response to a 3-Day High-Fat Diet in Obese Individuals, Gina Battaglia, East Carolina University, Greenville, NC 27858 Obese individuals have diminished whole-body lipid oxidation and transcription of genes involved in fatty acid transport and substrate switching (i.e. reduced metabolic flexibility) in response to a short-term high-fat diet. Short-term exercise has been shown to improve skeletal muscle lipid oxidation in obese individuals, but has not been studied in conjunction with high-fat feeding. PURPOSE: To compare skeletal muscle lipid oxidation responses to a 3-day high-fat diet in sedentary lean and obese individuals, and determine the effects of 10 consecutive days of aerobic exercise on metabolic flexibility. METHODS: Eight lean (BMI=22.6±1.4 kg/m2) and eight obese (BMI=33.7±0.7 kg/m2) males consumed an isocaloric high-fat (70% of total calories) diet for 3 days. Fasting muscle biopsies were taken on days 1 and 4 and fatty acid oxidation (FAO) measured by incubating muscle homogenates with end-labeled [1-14C]. Ten days of aerobic exercise was performed and the 3-day high-fat diet repeated during days 8-10 of the exercise training, with muscle biopsies taken on days 8 and 11. RESULTS: Lean subjects increased FAO significantly in response to the 3-day high-fat diet (mean ±SEM 28.0±9.3%, p=0.04), whereas obese subjects did not (0.5±11.1%). After 10 days of exercise with a 3-day high-fat diet, lean individuals increased [1-14C]oxidation by 37.8±15.1% over their pre-diet biopsy on day 8(p=0.05). Obese individuals increased [1-14C] oxidation by 30.0±19.0% over their day 8 biopsy (p=0.06 vs. pre-exercise change). CONCLUSION: Lean, but not obese, individuals increase skeletal muscle lipid oxidation after a 3-day high-fat diet. Aerobic exercise may improve skeletal muscle lipid oxidation response to short-term high-fat feeding in obese individuals.	P24

Investigation of the Interaction between TLRR and Protein Phosphatase 1 Isoforms, Nicole Devaul, Ann Sperry, Rong Wang, East Carolina University, Greenville, NC 27858 Most male infertility cases are idopathic and only 10-20% of cases can be successfully treated. To design appropriate treatments for male infertility, molecular mechanisms underlying spermatogenesis must be better understood. Spermiogenesis, the third phase of spermatogenesis, involves transformation of germ cells from round, non-polar spermatids into elongated spermatazoa. During this phase, a mictrotubule structure, the manchette, forms around the nucleus and serves as a scaffold for proteins involved in transport and cell signaling. Using RT-PCR with primers specific to kinesin-related genes, KIFC1 was identified and found associated with the nucleus and manchette region of developing spermatids. KIFC1 was used in a Yeast 2-Hybrid screen to identify interacting proteins specific to testis. Testis Leucine Rich Repeat (TLRR), also known as lrrc67, comprised 50% of clones identified in this screen and contains four leucine rich repeats and a presumptive PP1 (Protein Phosphatase-1) binding site. There are three isoforms of PP1: PP1±, PP1³1, and PP1³2; the latter is found exclusively in testis. Immunofluorescence localization experiments demonstrated that TLRR is concentrated near the manchette region in mid-stage spermatids and relocates to the centrosome in late stage spermatids. Importantly, TLRR is found to co-immunoprecipitate with testis specific PP1 isoform, PP1³2, in testis lysate. It is our hypothesis that TLRR targets PP1 to the spermatid cytoskeleton to regulate proteins involved in spermatid transformation. The purpose of the experiments described here is to use Yeast 2-Hybrid to further provide support for interaction between TLRR and PP1 and to determine relative binding affinity of TLRR and PP1 isoforms. Plasmids expressing TLRR and different PP1 isoform proteins were co-transformed into yeast. This system allows for expression of ²-galactosidase when TLRR plasmids expressing the DNA-binding domain of the GAL4 transcription factor interacts with PP1 isoform plasmids expressing the activation domain of this transcription factor. Levels of ²-galactosidase can be quantified using Chlorophenol red-²-D-galactopyranoside (CPRG) assay, which releases a product visible between 570 and 595nm. Our preliminary conclusions suggest TLRR may have a higher binding affinity for PP1³2 compared to PP1³1 and many not bind to PP1±.	P25
Drosophila Mcm10: One protein implicated in multiple cellular processes, Michael Reubens, East Carolina University, Greenville, NC 27858 Mcm10 is an abundant nuclear protein that is essential for DNA replication. This replication factor, first discovered in S. cerevisiae, has been shown to interact with proteins of the pre-replication complex (Pre-RC), the pre-initiation complex (Pre-IC), and heterochromatin protein 1(HP1). As it is now becoming more apparent that the processes of DNA replication and the establishment of epigenetic chromatin states are more intimately linked than once thought; the D. melanogaster homolog Mcm10 provides an excellent subject by which the connections of these two essential	P26

processes can be investigated. Recently our lab conducted an analysis of two Drosophila Mcm10 mutants which demonstrated that Mcm10 not only plays a role in DNA replication, but also has a role in heterochromatic silencing and chromosome condensation. Interaction studies in yeast, as well as both phenotypic and genetic analyses in Drosophila, imply that the conserved C terminus is important for the many interactions carried out by this promiscuous protein. In light of these recent results, we have continued our investigation of the conserved Drosophila Mcm10 protein using three mutants which truncate the C terminus by 85, 263, and 388 amino acids respectively. Genetic and phenotypic analysis of the Mcm10-263 and Mcm10-388 truncation alleles have revealed a homozygous female sterility issue, that ultimately results from apoptotic-like event in later stages of oogenesis. The apoptotic-like phenotype observed in the ovaries of these homozygous mutant females phenocopies that of the minifly (mfl) mutant described by Giordano et al. 1999. These mutant phenotypes taken together with yeast interaction data suggesting an interaction between Mcm10 and RNA Pol1 associated factor PAF67 (CG5642), and both in vivo and in vitro cellular localization results depicting Mcm10 in the nucleolus; suggest that Mcm10 may function in ribosome biogenesis as well as its established functions in DNA replication and chromatin dynamics.	
Novel Anti-Cancer Activity of Cucurbitacin IIa Through STAT3/JAK2-independent, Survivin and PARP-Mediated Apoptosis and Disruption of Actin, Christi Boykin, RW Zhang, WM Yang, Qun Lu, Gen Zhang, Yan-Hua Chen, East Carolina University, Greenville, NC 27858 Cucurbitacin (Cuc) and triterpene derived natural products exhibit anti-cancer potential in addition to their conspicuous anti-bacterial and anti-inflammatory activity. Recently, inhibition of JAK2/STAT3 signaling was shown to underlie the effects of Cuc family members on inducing cell death in many cancer types. Here, we report that Cuc IIa, the active component purified from the medicinal plant Hemsleya amalils Diels, inhibited cancer cell growth, induced apoptosis, and reduced tumor growth in vivo. Cuc IIa induced the irreversible clustering of filamentous actin and the increases in G2/M populations in cell cycle, indicating the disruption of actin cytoskeleton as the likely mechanism of inducing apoptosis. Flow cytometry confirmed increased cell death whereas western blots showed reduced phospho-histone H3, consistent with reduced mitosis. Cleavage of Poly (ADP-ribose) polymerase or PARP, immediate upstream of DNA breakdown as a result of caspase activation, was increased dramatically. However, unlike other Cuc members, Cuc IIa did not suppress JAK2/STAT3 phosphorylation or increase phosphorylation of mitogen-activated protein kinases. Instead, the expression of the Inhibitor of Apoptosis Protein (IAP) survivin was reduced. Prostate cancer cells stably transfected with oncoprotein ´-catenin, which increased survivin expression and suppressed small GTPase RhoA, showed a reduced efficacy of Cuc IIa to induce cell death. Supporting the effects of Cuc IIa on actin cytoskeletal signaling, RhoA phosphorylation was reduced suggesting its increased activity. These studies highlight Cuc IIa as a novel class of anti-cancer drug in suppression of cancer cell expansion by disrupting the actin cytoskeleton and directing the cell to undergo PARP-mediated apoptosis through the inhibition of	P27

survivin downstream of JAK2/STAT3.	
HOX Expression in Exponentially Growing and Differentiated Colon Cancer Cell Line HT-29, Justin Castellow, Lucy Conaty, East Carolina University, Greenville, NC 27858 We are studying how the variation in HOX gene expression regulates the differentiation of two colon cancer cell lines; HT29 and Caco2. These colon cancer cell lines acquire differentiated characteristics after reaching confluency (Caco2) or after being exposed to galactose (HT29). When cultured for two weeks post confluency, Caco-2 cells develop brush border membranes, tight junctions, become polarized and express enzymes characteristic of a differentiated epithelium. HOX genes play an essential role in the patterning of the anterior/posterior and proximal/distal embryonic body plans. It has been recently demonstrated that these genes play an important role in maintaining tissue differentiation and become de-regulated in cancer cells. Nevertheless, the mechanism and role of HOX gene regulation during carcinogenesis remains unclear. Our research is aiming to answer these questions by analyzing HOX gene expression in proliferating and differentiated colon cancer cells. To date we have analyzed the expression of the 39 Hox genes in differentiated and undifferentiated cells using RT-PCR. Difference in expression are presently being more precisely quantified using qRT-PCR. From these data, we will select hox genes which are preferentially expressed in differentiated colon cancer cells and analyzed their role using gain and loss of function experiments.	P28
LasR interacts with the pqsR promoter region in Pseudomonas aeruginosa. John Farrow, Matthew Ellison, Everett Pesci, East Carolina University, Greenville, NC 27858 Pseudomonas aeruginosa is an opportunistic pathogen that causes both acute and chronic infections in immunocompromised individuals, and is a leading cause of morbidity and mortality for patients with cystic fibrosis. During infection these bacteria coordinate the expression of numerous virulence factors by cell-to-cell communication through diffusible small molecules. P. aerugionsa possesses two acyl homoserine lactone-based signaling systems: N-(3-oxododecanoyl) homoserine lactone with its receptor LasR, and N-butyryl homoserine lactone with its receptor RhlR. A third signaling molecule, 2-heptyl-3-hydroxy-4-quinolone (the Pseudomonas quinolone signal (PQS)), is also crucial for virulence. PQS acts as a coinducer for the transcriptional regulator PqsR (also known as MvfR), which induces the expression of the pqsABCDE operon. The first four genes in this operon encode proteins necessary for the biosynthesis of PQS and other quinolones, while the final gene, pqsE, encodes a protein which regulates multiple virulence factors in conjunction with the rhl signaling system. We have previously found that LasR interacts with the pqsR promoter region, and positively regulates its expression. In this study, using electrophoretic mobility shift assays and DNase I footprinting with purified LasR, we show that LasR interacts with a single 27 bp region centered 248 bp upstream of the pqsR transcriptional start site. This binding site also placed LasR	P29

221 bp upstream from the translational start site of the divergently transcribed nadA gene, suggesting that these two genes may be co-regulated. We identified the transcriptional start site of nadA using primer extension analysis, and tested the affect of LasR on expression of nadA using nadA -lacZ fusions. These data showed that LasR does not significantly affect the transcription of nadA, and indicated that LasR binding is primarily involved in the initiation of pqsR transcription. Further studies will be aimed at investigating how LasR participates in the process of transcriptional initiation from its distal binding site, as well as identifying other factors which play a role in the induction of pqsR. Understanding the regulation of pqsR will provide greater insight into the P. aeruginosa signaling network, and may identify new potential targets for disrupting signaling and reducing the virulence of this organism.	
Total Protein Concentration in Blood Serum as Determined by Benchtop Time-Domain NMR, Michelle Robinson, East Carolina University, Greenville, NC 27858 Total protein concentration in human serum is a commonly used diagnostic test. Abnormally high protein concentrations are observed in kidney or liver disease, hepatitis, and leukemia. Low concentrations are seen in patients with Crohn s disease, diabetic nephrosis and hyperthyroidism[1]. Current clinical methods for measuring total protein use the copper-based biuret assay in which the color intensity is indirectly related to protein concentration[2]. The biuret method is accurate for determining protein concentration in healthy patients without interferences from lipoprotein turbidity, bilirubin and hemolysis[3]. However due to the increasing incidence of obesity and diabetes in the population, this method may be a less reliable indicator of total protein concentration. These metabolic abnormalities often lead to hypertriglyceridemia. The excessive amounts of very low density lipoproteins and chylomicrons in the blood result in sample turbidity. To overcome these limitations, we are investigating the utility of bench top time domain NMR (TD-NMR) as a new method for measuring total protein concentration. This technique measures the spin relaxation behavior of 1H resonance of water and other components in serum. These measurements are sensitive to molecular mobility at both the particle and domain level. Unlike the biuret method, the TD-NMR requires no chemical reactions, use of reagents or sample perturbation. A range of protein mixtures were used to investigate the correlation between protein concentration(g/dL) and the relaxation rate, R2(s-1). We began with the most abundant protein in serum, bovine serum albumin (BSA) and human serum albumin (HSA), and found a linear positive correlation. Next, bovine gamma globulin (BGG) was tested and we found that the same relationship held true. Similar trends were seen in an increasingly complex series of BSA and BGG mixtures. Also, in dilution series of whole bovine and human serum the same association was observed. Finally, we prepared a dilution series of lipoprotein deficient human serum and found that that the lipoproteins in human serum did not effect the protein concentration dependence of R2. The non-invasive protocol and the ease of data collection indicates that benchtop TD-NMR is a promising tool for the accurate measurement of total protein and circumvents the present limitations of the biuret method.	P30

Duodenal-jejunal bypass surgery improves glucose homeostasis but does not decrease skeletal muscle inflammation in female ZDF rats. MA Reed, RD McKernie, RC Sloan, III, EZ Lukosius, JR Pender, V Boghossian, JJ Carter, K Parikh, JW Price, EB Tapscott, M Dar, WJ Pories, GL Dohm, and TP Gavin, East Carolina University, Greenville, NC 27858 Duodenal-jejunal bypass (DJB) has been shown to reverse type 2 diabetes (T2DM) in Goto-Kakazaki (GK) rats, a rodent model of non-obese T2DM. However, it is not known if this same reversal occurs in female ZDF rats which are a rodent model of high fat diet induced T2DM. Additionally, skeletal muscle inflammation has been associated with T2DM. The aim of the current work was to investigate the effects of DJB on glucose homeostasis and skeletal muscle inflammation. It was hypothesized that DJB would improve glucose homeostasis and decrease skeletal muscle inflammation in female ZDF rats. DJB and Sham operations were performed in female ZDF rats. At four weeks post-surgery, an OGTT and IPGTT were performed and inflammatory markers Toll-like receptor 4 (TLR4), c-Jun amino terminal kinase (JNK), phospho-c-Jun amino terminal kinase (p-JNK), IºB-kinase complex (IKK) were measured in the gastrocnemius. In DJB rats compared to the Sham operation, DJB improved glucose area under the curve (AUC) during the OGTT. There were no differences between the DJB and sham groups for any marker of skeletal muscle inflammation. Our preliminary data indicate that in high fat fed female ZDF rats; DJB restores glucose homeostasis but does not affect skeletal muscle inflammation, indicating that in this rodent model of T2DM skeletal muscle inflammation may not contribute to glucose homeostasis. Future studies will investigate the mechanisms through which DJB improves glucose tolerance.	P31
Systematic Study of CD Spectroscopy Data Collection Technique Using Signal-to-Noise Ratio, Julie DiNitto, East Carolina University, Greenville, NC 27858 Circular Dichroism (CD) is a spectroscopic technique using the difference in absorbance of left and right circularly polarized light to aid in the understanding of secondary structures of chiral molecules, primarily proteins. Shot noise (i.e., noise governed by Poisson statistics) is a dominate factor in signal degradation for spectroscopic techniques. A systematic study of it in CD spectroscopy has not been reported. To better understand the transfer function (i.e., signal) describing CD spectrometers, the effect of shot noise was systematically investigated as a function of different spectrometer parameters, such as bandwidth, response time, scan speed, and number of scans as well as its dependence on detector gain as determined by the detector voltage (HT). In particular, the noise characterization of the Jasco J810 and J815 CD machines in the lab of Dr Kenney (Physics Dept, ECU) and Dr Hicks (Chemistry Dept, ECU) is presented. In addition, the relationship between high tension and signal-to-noise ratio is discussed and a generalized (normalized) signal-to-noise ratio is determined as a function of HT.	P32

TPA-Mediated COX-2 Signaling is Blocked by Apigenin in the Mouse Epidermis, Alex Kiraly, East Carolina University, Greenville, NC 27858 Background: The most common type of cancer in the USA is non-melanoma skin cancer, with more than one million new cases expected each year. Skin carcinogenesis can be induced in animals by either the two-stage chemical carcinogenesis model using 7, 12-dimethylbenz[a]anthracene (DMBA) and 12-O-tetradecanoylphorbol-13-acetate (TPA) or the UVB-light induced model. Both chemically- and UVB-induced skin tumors overexpress cyclooxygenase-2 (COX-2). COX-2 is an enzyme that is induced by various stimuli and regulated by numerous signal transduction molecules including cytosolic phospholipase A2 (cPLA2). COX-2 is required for prostaglandin (PG) production, and PG generation contributes to tumorigenesis by promoting cell growth, cell proliferation, angiogenesis, and tumor metastasis. Evidence indicates that both COX-2 and PGE2 levels are elevated in tumors of differing tissue types. In addition, inhibition of COX-2 either pharmacologically or through genetic deletion, blocks tumor development. Apigenin is a non-mutagenic bioflavonoid present in various foods including apples, green leafy vegetables, and chamomile tea. Apigenin inhibits chemical- and UVB-induced skin tumorigenesis. Our previous data shows that apigenin inhibits TPA-induced COX-2 expression in cultured keratinocytes by decreasing arachidonic acid release through inhibition of cPLA2. Hypothesis: Apigenin inhibits TPA-induced COX-2 signaling in the mouse epidermis by inhibiting cPLA2 activation. Methods: Female SKH-1 hairless mice were treated topically with TPA in 200 ¼l acetone. Mice were pretreated one hour prior with apigenin in 200 ¼l DMSO or DMSO alone. Animals were euthanized 8 hours later and the epidermis isolated and pooled for Western Blot and PGE2 analysis. Results: Topical treatment of mouse epidermis with apigenin inhibited TPA-induced COX-2 protein expression and PGE2 synthesis. Apigenin also decreased activation of cPLA2 and increased apoptosis in the mouse epidermis. Conclusion: Collectively, our findings reveal that apigenin inhibits TPA-induced COX-2 signaling in SKH-1 mouse epidermis.	P33
N-3 Polyunsaturated Fatty Acids as Regulators of Antigen Presentation, Heather Teague, Saame Raz Shaikh, Benjamin Rockett ,Mitch Harris, East Carolina University, Greenville, NC 27858 N-3 polyunsaturated fatty acids (PUFAs), specifically docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) found in fish oil, exert immunosuppressive effects. However, the complete mechanism by which n-3 PUFAs suppress inflammation has not been elucidated. Furthermore, no previous studies have determined the effects of n-3 PUFAs on antigen presenting cells (APC), which present antigen to cognate T cells. In this study, we focus on the mechanistic effects of n-3 PUFAs on antigen presenting dendritic and B cells. N-3 PUFA uptake into the cell	P34

occurs rapidly, followed by incorporation into the plasma membrane. We propose that incorporation of n-3 PUFA acyl chains into the plasma membrane of APC disrupts the formation of lipid raft domains, which in turn decreases the activation of T cells. Initially we tested this hypothesis by quantifying the amount of DHA accumulating in lipid rafts. Treatment of splenocytes for 5 minutes with DHA revealed about 15% of DHA co-localized within the lipid raft domain. We then tested the effects of dietary supplementation with n-3 PUFAs in C57BL/6 mice. Significant increases in the size of lipid raft domains were noted in n-3 PUFA treated mice compared to controls. Finally, we investigated the functional consequences of disruptions within lipid raft domains by testing the ability of APC to activate T cells, following 3 weeks of n-3 PUFA supplementation. Preliminary data show a decrease in T cell activation, evident by decreased CD69 surface expression and IL-2 secretion. Similar trends were exhibited between dendritic and B cells. We are continuing to confirm our findings by conducting additional T cell activation experiments at shorter time points, looking at specific signaling events and using biochemical analysis to obtain a more accurate assessment of the plasma membrane composition. Deducing the mechanism of n-3 PUFAs immunosuppressive effects will lead to alternative treatments for inflammatory disease.	
Inhibiting mitochondrial uncoupling protein 2 exacerbates myocardial ischemia/reperfusion injury, Fatiha Moukdar, David A. Brown, Robert M. Lust, Reuben C. Sloan, Chad R. Frasier, East Carolina University, Greenville, NC 27858 Uncoupling protein (UCP) 2 is an inner mitochondrial membrane protein known to mildly dissipate the mitochondrial membrane potential and is expressed in several mammalian tissues, including the heart. When overexpressed, UCP2 has been shown to reduce oxidative stress-induced death in cultured cardiomyocytes, and cerebral damage in experimental ischemic stroke models. To test the hypothesis that UCP2 is an essential element of the cardiac response to ischemia/reperfusion (I/R) injury, we used hearts from Sprague-Dawley rats and subjected them to 25 min global ischemia (Langendorff model) followed by 60 min reperfusion with or without the UCP2 inhibitor, genipin. Hearts were instrumented to measure left ventricular (LV) systolic, end-diastolic, developed pressures (DP), and coronary flow. In genipin treated group, the drug was administered in the perfusate for 20 min before ischemia. Our results show that the inhibition of UCP2 was associated with increased infarct size (81.95 ± 1.994% of the area at risk vs. 34.08 ± 1.771%, $p<0.001$), and decreased post-ischemic recovery of both LVDP (7.9 ± 1.602% vs. 26.08 ± 1.215%, $p<0.001$), and coronary flow (35.36 ± 3.270% vs. 62.76 ± 4.340%, $p<0.01$). All values are expressed in percent of baseline and compare genipin treated group to control. Our data suggest that UCP2 participates in cardioprotection from IR injury, by limiting necrosis and by promoting functional recovery.	P35

Effectiveness of the C57BL/6 mouse strain within a chronic model of asthma, Stefanie Burleson, Michael Van Scott, Dianne Walters, East Carolina University, Greenville, NC 27858 Allergic asthma is a Th2-dominant, immune-mediated chronic disease marked by reversible airway obstruction, hyperresponsiveness, and inflammation to a variety of normally innocuous stimuli. Diverse animal models are used to study processes underlying asthma, and murine models are most common. The model typically involves injection of allergen and adjuvant to sensitize the animal, followed by a single strong antigenic challenge to yield a robust, short-lived respiratory response. The disease in humans is better represented by environmental exposure to low levels of antigen causing chronic responses. Chronic mouse models of asthma are often implemented using BALB/c mice. Few BALB/c transgenic phenotypes are available, however, limiting potential for genetic manipulation. In contrast, the C57BL/6 strain is often used in transgenic platforms, but induction of allergic responses is more difficult in this strain. Here, we investigate the use of the C57BL/6 mouse strain within a chronic model of asthma. Mice were randomly assigned to one of three experimental groups (n = 8/group): Animals sensitized with ovalbumin antigenic peptide (OVA323-339) and challenged with aerosolized OVA; animals sensitized with OVA323-339 and challenged with PBS; and naive animals. Animals (with the exception of naive mice) were sensitized on days 0 and 12 with OVA323-339 and aluminum hydroxide. Mice underwent five weeks of aerosol challenge (5% whole OVA in PBS or PBS alone); six challenges on week one and three challenges per week for the remainder of the study. Mice were sacrificed on days 29, 36, and 57 to ascertain the presence of a chronic response. To determine the severity of OVA-induced effects on airway and lung structure and function, measurements of resistance, compliance and methacholine sensitivity were obtained through a FlexiVent system; bronchoalveolar lavage fluid (BALF) inflammatory cell profiles were analyzed in BALF and cytospins used for differential cell counts; and histological analysis were performed on lung tissue sections. Animals sensitized and challenged with OVA exhibited airway inflammation and structural changes in the airway wall. No significant differences in airway hyperresponsiveness was observed. Thus, following chronic exposure to OVA, C57BL/6 exhibit some, but not all of the hallmark features of asthma.	P36
Decreases in reperfusion arrhythmias following ten days of exercise is not associated with improved mitochondrial calcium retention capacity, Chad Frasier, Fatiha Moukdar, Robert Lust, David Brown, Ruben Sloan, East Carolina University, Greenville, NC 27858 Exercise-induced cardioprotection is one of the few sustainable strategies known to decrease cardiac injury following an ischemic event, but the exact mechanisms remains at large. Recent studies have shown that preserving mitochondrial energetics leads to a decrease in the severity of arrhythmias. The purpose of this study was to determine if exercise induced cardioprotection is due	P37

to preservation of mitochondrial energetics via improved reactive oxygen species scavenging and/or delayed opening of the mitochondrial permeability transition pore (PTP) leading to a phenotype that is more resistant to cardiac arrhythmias. Female Sprague-Dawley rats were randomly assigned to either the sedentary handling control (Sed) or the exercise trained (Ex) group. Animals in the Ex group were placed on a motorized treadmill at speeds of 15/30/15 meters per minute for 15/30/15 minutes respectively for ten consecutive days. Twenty-four hours after the last session hearts were excised via thoracotomy and either instrumented for isolated heart experiments or used for mitochondrial isolations. Isolated hearts were exposed to global ischemia for 30 minutes, followed by 30 minutes of reperfusion. Ex led to a significant decrease in the severity of arrhythmias by: 1) reducing the arrhythmia score (5.7 ± 0.9 and 3.0 ± 0.6, for Sed and Ex group respectively, $P < 0.05$) and 2) decreasing the time spent in a ventricular arrhythmia (11 ± 3 and 2 ± 1 minutes, for Sed and Ex group respectively, $P < 0.05$). Western blots for both superoxide dismutase (SOD) isoforms showed that neither MnSOD nor Cu/ZnSOD protein levels were increased following Ex. In isolated mitochondria, the calcium retention capacity in Ex animals was significantly lower than Sed counterparts (433 ± 33 and 343 ± 10 nmoles of calcium, for Sed and Ex respectively, $P < 0.05$). Our results suggest that Ex causes intrinsic changes in the female heart that decrease the severity of arrhythmias without increases in protein expression of MnSOD or Cu/ZnSOD. Surprisingly, the mitochondria of trained animals were more sensitive to calcium-induced opening of the mitochondrial permeability transition pore. Future experiments investigating the kinetics of calcium uptake and extrusion in isolated mitochondria will improve our understanding of how mitochondrial calcium handling influences the propensity for arrhythmias.	
Muscle Force Sensitivity to Muscle Model Parameters during Single-Leg Squatting, John Pope, Tibor Hortobagyi, Anthony Kulas, Paul DeVita, East Carolina University, Greenville, NC 27858 Musculoskeletal models are routinely used to investigate how muscles influence human movement. Individual muscle parameters specific to the muscle itself are tendon slack length, optimal fiber length, pennation angle, and max isometric force. Previous sensitivity analyses during gait have shown the muscles most sensitive to changes of muscle parameters are the muscles most involved during gait. Optimal fiber length and tendon slack length are the 2 parameters most sensitive to producing changes in muscle forces (Xaio et al, 2010, n=3). We preliminarily examined the sensitivity of these same 2 parameters on the knee muscles during single-leg squatting (n=1), a task requiring greater knee range of motion compared to gait. We hypothesized that during squatting the knee muscles would be more sensitive to muscle parameter changes due to the increased knee range of motion.Muscle forces were est. using a Hill muscle model while a traditional static optimization procedure distributed the muscle forces among the all of muscles across the knee joint. Optimal fiber length and tendon slack length were altered +/- 10% for 8 knee muscles resulting in 32 altered optimizations. Sensitivity was calc. as the ratio of the % change in avg. muscle force over the course of the squat cycle to the size of the perturbation (+/- 0.10). Sensitivities > 1 were considered significant. A summary of our findings shows that perturbations to the optimal fiber length of the	P38

VL and RF muscles resulted in high sensitivities (1.0-16.2) in both the same muscle and the antagonistic hamstring muscles. For tendon slack length, perturbations to the hamstring muscles and VL resulted in high sensitivities (1.1-9.9) to all knee muscles during the squat. Generally, tendon slack length perturbations resulted in more frequent significant sensitivities compared to optimal fiber length. The sensitivity of muscle parameters to the muscles crossing the knee joint during squatting was greater compared to published sensitivity reports during gait (Xaio et al, 2010). Using direct muscle architectural measurements from ultrasound images may provide more realistic estimations of muscle forces vs. traditionally scaled muscle parameters, which aren't subject specific	
Establishing Linkage Between Gins Complex Sub-Unit Sld5 And Checkpoint Protein Chk2 Using Drosophila Melanogaster As Model Organism, Divya Devadasan, East Carolina University, Greenville, NC 27858 Eukaryotic DNA replication is controlled by a number of proteins that ensures the process takes place accurately. GINS is a hetero-tetrameric protein complex that is essential for the initiation and progression of eukaryotic DNA replication. The GINS complex plays a role by supporting interactions between the MCM2-7 complex and Cdc45 during S phase, along with the activation of polymerase μ and DNA pol ± primase complex. The GINS complex constitutes four subunit proteins; Sld5, Psf1, Psf2, Psf3. The Sld5 subunit of GINS is an evolutionarily conserved protein. Within the GINS complex Sld5 interacts with Psf1 via N terminal alpha helical domains and with Psf2 through a combination of ±-helical and ²-sheet domains in the C-terminal half of the protein. Sld5 has been previously shown to interact with the Drosophila Mcm10. Previous research from our lab also shows that Sld5 is required for normal cell cycle progression and the maintenance of genomic integrity. In addition the depletion of other GINS sub-units Psf1 and Psf2 by siRNA in human fibroblasts lead to genomic instability and activation of Chk2. Activation of this intra-Sphase checkpoint reduces the rate of DNA replication. Preliminary results in Drosophila show that there are mitotic defects and M-phase delays compared to wild-type in the Sld5 mutant lines. To further investigate the role of Sld5 in checkpoint signaling in eukaryotic organisms, a multifaceted approach is being used wherein a Sld5-Chk2 double mutant is generated to check for replication defects and cell cycle progression. The role of Sld5 in integrating DNA replication with checkpoint signaling is investigated by depleting Sld5 and determining its effects on Chk2 phosphorylation and various immunostaining techniques to detect double-stranded breaks indicative of DNA damage. Errors due to under-replication or over-replication can lead to disastrous consequences leading to several genetic diseases like cancer, developmental abnormalities etc. Therefore, analyzing the role of Sld5 in checkpoint regulation is essential for understanding its contribution in the maintenance of genomic stability.	P39

Mur regulates the gene encoding the manganese transporter MntH in Brucella abortus 2308, Evan Menscher, Clay Caswell, Eric Anderson, R. M. Roop, East Carolina University, Greenville, NC 27858 MntH is the only high affinity manganese transporter identified in Brucella. A previous study showed that MntH is required for the wild-type virulence of Brucella abortus 2308 in mice (E. S. Anderson, J. T. Paulley, J. M. Gaines, M. W. Valderas, D. W. Martin, E. M. Menscher, T. D. Brown, C. S. Burns, and R. M. Roop II, Infection and Immunity 77:3466-3474, 2009), and indicated that the mntH gene in regulated in a manganese-responsive manner in this strain by a Mur homolog. In the study presented here, the transcriptional start site for mntH in B. abortus 2308 was determined by primer extension analysis, specific interactions between Mur and the mntH promoter region were demonstrated in an electrophoretic mobility shift assay, and a Mur-binding site was identified in the -55 to -24 region of the mntH promoter by DNase I footprint analysis. The specificity of the interaction of Mur with the putative "Mur box" was further evaluated in EMSA employing oligonucleotides in which the consensus nucleotides in this region were substituted. These studies not only confirm the a direct role for Mur in the Mn-responsive regulation of mntH expression in Brucella abortus 2308, but also identify the cis-acting elements upstream of mntH responsible for this regulation.	P40
Effects of Nicotine on Caenorhabditis elegans - Development of Invertebrate Animal Model for Drug of Abuse, Michael Smith, Yanqiong Zhang, Baohong Zhang, Xiaoping Pan, East Carolina University, Greenville, NC 27858 Although much is known about the effects of nicotine on the nicotinic acetylcholine receptors (nAChRs), little is known about the effects on nAChRs subunits, and their targeting microRNAs (miRNAs). miRNAs may play a key role in regulating gene expression in response to nicotine exposure. These effects on gene expression may be the cause of long term use and the "addictive" behavior that is often exhibited with use of nicotine. Our goals are to elucidate the role of microRNAs following nicotine exposure and to develop the Caenorhabditis elegans (C.elegans) as a model organism in our lab for the assay of environmental pollutants. We hypothesize that 1) Nicotine affects survival and reproduction of C. elegans; 2) The expression of nicotinic acetylcholine receptor will be affected by nicotine exposure in a temporal and dose-dependent pattern; 3) miRNA regulates the expression of some genes coding for nicotinic acetylcholine receptors. We used nicotine, a common abused drug, to investigate effects of survival, behavioral, and gene/protein expressions in C elegans. In survival trials, we tested a range of doses in order to obtain a 24- hour dose-dependent pattern. The 24-hour LD5 and LD 80 in C.elegans correspond to doses of .1 ppm to 316 ppm of nicotine, respectively. Also we are performing behavioral assays, to measure effects on the growth, movement, and egg laying ability of the worms. Using qRT-PCR, we have revealed that a variety of egg-laying related genes are altered by nicotine which may be regulated by miRNAs. Future experiments will focus on the correlations of miRNA expressions and	P41

their targeting gene expressions.	
Modified Vaccinia Ankara as an Oncolytic virus and its use in Pancreatic Cancer, Andrew Freistaedter, Rachel Roper, Gwendolyn Jones, Emmanuel Zervos Pancreatic cancer is the fourth leading cause of cancer-related deaths in the United States, and it has less than a 5% survival rate over 5 years. Pancreatic tumors over-express the protein mesothelin compared to normal cells, and therefore, mesothelin may be a good tumor target antigen. Our current research focuses on using an improved Modified Vaccinia Ankara (MVA) virus to present mesothelin to the immune system to treat pancreatic tumors in mice. The improved MVA vector is a virus we made that has the poxvirus A35R gene deleted (A35R). The A35R gene inhibits MHC II antigen presentation, and we have shown that its removal improves both B and T lymphocyte responses. Wild-type (normal) and A35R MVA viruses were constructed to express mouse mesothelin. PCR was used to confirm the presence of the mesothelin gene sequence in the recombinant virus and to show its purity from parental MVA. Both Western blot and FACS analysis were used to verify mesothelin protein expression. Our hypothesis is that the A35R virus will be more efficient at stimulating the immune system and protecting from tumors caused by the Panc02 pancreatic adenocarcinoma cell line. MVA does not normally replicate in mammalian cells, but we have found that this virus can kill Panc02 cells, indicating that MVA is also an oncolytic virus for this tumor model. Preliminary results from a one-step growth curve suggest MVA can also replicate in Panc02 cells. Trials are underway in mice to assess the protective efficacy of MVA mesothelin and MVA A35R mesothelin cancer vaccines.	P42
Assessment of perfluorooctanoic acid (PFOA)-induced developmental cardiotoxicity, Qixiao Jiang, Robert Lust, Jamie DeWitt, East Carolina University, Greenville, NC 27858 Perfluorooctanoic acid (PFOA) is widely used as a surfactant and is persistent and widespread in the environment. Concerns of developmental toxicity have been raised by studies that have demonstrated that PFOA is capable of inducing development delays and increases in mortality. This study assessed morphological and functional changes in hearts from chickens developmentally exposed to PFOA. Chicken (Gallus gallus) eggs were air-cell injected prior to incubation (D0), with doses of 0, 0.5, 1 or 2 mg/egg kg in a sunflower oil vehicle. To assess morphology, embryos were removed from eggs and sacrificed on D19. Hearts were collected, formalin-fixed, embedded in paraffin, sectioned at 6 microns, and stained with hematoxylin and eosin (H&E) or for myosin. In H&E stained hearts, right ventricular wall thickness was decreased by 20.15% ($P<0.05$) in the 1 mg/kg group and by 18.06% in the 2 mg/kg group ($P>0.05$), relative to controls. Immunohistochemistry against myosin illustrated that the myosin dense layer was significantly thinner in both 1 mg/kg (27.07%, $p<0.05$) and 2 mg/kg (28.59%, $P<0.05$) groups. To assess function, one-day-old hatchling chickens were evaluated with cardiac ultrasound. Significant alterations were observed in heart rate, stroke volume and left ventricle morphological parameters.	P43

Specifically, heart rate was 7.7% lower in the 0.5 mg/kg group, 55.7% higher in the 1 mg/kg group, and 53.3% higher in the 2 mg/kg group when compared to controls (P<0.05). Stroke volume was 12.2% higher in the 0.5 mg/kg group and 29.5% lower in the 2 mg/kg group relative to controls (P<0.05). Left ventricular posterior wall diastolic dimension was significantly increased among all treatment groups (0.5 mg/kg: 5.6%; 1 mg/kg: 29.4%; 2 mg/kg: 71.4%; P<0.05). In addition, a cardiac myofibril ATPase assay indicated that the ratio of calcium independent ATPase activity to calcium ATPase activity was significantly higher in the 1 mg/kg group (30.7%, P<0.05), which confirms the alteration to cardiac function. In summary, morphological and functional changes present in PFOA-exposed chicken embryos/hatchlings, suggest that the heart is a developmental target of PFOA.	
Blocking mitochondrial permeability transition pore opening attenuates ischemia/reperfusion injury in diabetic hearts, Ruben Sloan, Chad Frasier, Fatiha Moukdar, Brian Hayes, David Brown, East Carolina University, Greenville, NC 27858 Diabetic patients are four times more likely to die following myocardial infarction than non-diabetics, and accordingly ischemic heart disease is the leading cause of death among the rapidly growing diabetic population. Following an ischemic event, cellular overload of reactive oxygen species (ROS) and calcium contributes to cell death by opening the mitochondrial permeability transition pore (PTP). The purpose of this study was to determine if increased mitochondrial calcium, heightened ROS and increased susceptibility to PTP opening augment ischemia/reperfusion (IR) injury in diabetic hearts. Isolated hearts from non-diabetic and streptozotocin-induced diabetic rats were perfused with a modified Krebs-Henseleit buffer and exposed to global no-flow ischemia for 20 minutes, with 120 minutes of reperfusion. Hearts were treated with either 5 uM NIM811 (PTP blocker), 1 uM minocycline (blocker of mitochondrial calcium influx) or 1 nM BendaviaTM (ROS scavenger) to determine the contribution of PTP opening, mitochondrial calcium influx, and ROS to IR injury, respectively. Diabetic hearts exhibited significantly higher infarct sizes when compared to non-diabetic animals (60 + 4% vs. 49 + 3%, respectively; P<0.05). NIM811, Minocycline and BendaviaTM reduced infarct size in diabetic rats (39 + 3%, 36 + 2% and 38 + 6%, respectively vs. 60 + 4%; P<0.05). Taken together, these data provide evidence that the increased susceptibility to IR injury in diabetic hearts is due to augmented PTP opening, increased mitochondrial calcium and elevated ROS. These insights may provide the framework for the development of novel therapeutic strategies seeking to improve IR injury in diabetic hearts.	P44

MicroRNA-34c loss of function promotes axon growth in regenerating primary dorsal root ganglion neurons, Mohamed Raafat, Abdalla H. Raafat, Di Wu, East Carolina University, Greenville, NC 27858 The peripheral nervous system is unique in its ability to regenerate axons after injury. Our lab previously assessed the miRNA expression levels of the regenerating sciatic nerve which indicated miR-34c up-regulation. MiRNAs are non-protein coding small RNA molecules, ~20 bp in length, that have been shown to control many basic cellular processes by post-transcriptional regulation. The purpose of this study was to identify the effect of miR-34c on regenerating axons of DRG neurons. 9 to 12 week CD-1 male mice were used for this study and were subjected to sciatic nerve crush lesion. Five days after surgery, animals were sacrificed, and DRGs were dissected and dissociated physically and enzymatically. DRG neurons were then grouped as follows: 1) non-transfected, 2) miR-34c mimic, 3) miR-34c inhibitor, 4) mimic negative control, and 5) inhibitor negative control. Cells were grown for 48 hours on glass cover slips, fixed, and incubated with primary beta-tublin III antibody and with secondary antibody conjugated with a fluorophore. Cells were viewed on an inverted fluorescent microscope, and images were captured using a digital camera. Axon length and branches were measured using ImageJ. Inhibition of miR-34c showed a 27% increase in axon length for uninjured cultures ($p<0.05$), a 23% increase in regenerating cultures ($p<0.05$), but no significant change in contra-lateral cultures when compared to the inhibitor negative control. Over expression of miR-34c showed a 16% decrease in regenerating cultures ($p<0.05$), but not in contra-lateral cultures. In conclusion, miR-34c inhibitor promoted axon growth in both uninjured, and regenerating cultures, but not in contra-lateral cultures. At the same time, over-expression of miR-34c produced a decrease in the number of branches in regenerating, but not in contra-lateral cultures. These results indicate that silencing of miR-34c may elicit a regeneration-like response in DRG neurons.	P45
Hypoxia and serum deprivation in human mesenchymal stem cells, and the protective role of thymosin β-4, Katherine Crifasi, Pradhan Payal, Collins Maria, Barbara J. Muller Borer, East Carolina University, Greenville, NC 27858 **Background**: Current literature suggests nutrient deprivation and hypoxia affect human mesenchymal stem cell (hMSC) survival after cell transplantation. Wound-healing protein Thymosin β-4 (Tβ4) has been shown to improve hMSC proliferation and prevent apoptosis. This study examines the effects of serum deprivation and hypoxia on hMSC survival, and the pro-survival effect of pre-treatment with Tβ4. **Methods**: To evaluate early cultures, hMSCs were grown under nutrient deprivation (1.5% FBS) with a 24 hour, 1ug/mL Tβ4 pre-treatment, then exposed to a 24 hours of hypoxia (1% O_2). After hypoxic exposure, hMSC intracellular stress was examined by a ROS assay, and proliferation was evaluated by a MTS assay. To evaluate expanded cultures, hMSCs were grown for 2 weeks in normal nutrients (16.5% FBS media), then nutrient deprived	P46

(1.5% FBS media) with a 24 hour, 1ug/mL Tβ4 pre-treatment, followed by 24 hours of hypoxia (1% O_2). Proliferation was measured with immunocytochemistry using a Ki-67 antibody. Protein expression of hypoxia inducible factor-1 alpha (HIF-1α), Vascular Endothelial Growth Factor- alpha (VEGF-α), caspase-3, B cell lymphoma-2 (Bcl-2), and Connexin 43 (Cx43) were measured with western blot. **Results**: In early cell cultures, nutrient deprived hMSCs showed increased ROS production and decreased proliferation compared to hMSCs in normal nutrients; hypoxia had no effect. In addition, Tβ4-treated, nutrient-deprived hMSCs under normoxia showed decreased ROS production and increased proliferation compared to non-treated hMSCs. After hMSC expansion, nutrient deprivation and hypoxia resulted in elevated caspase-3 protein expression. However, hMSCs subjected to hypoxia showed increased HIF-1α and VEGF-α expression. Additionally, Tβ4-treated, nutrient-deprived hMSCs trended upward in HIF-1α, VEGF-α, and Bcl-2 expression under normoxia and hypoxia, and upward in Cx43 expression under hypoxia. **Discussion**: These findings suggest that nutrient deprivation is the predominant factor affecting hMSC survival in early cultures. However, Tβ4 may promote survival in nutrient-deprived hMSCs in early and expanded cultures, and also stimulate angiogenesis in expanded cultures. Further studies regarding Tβ4 effectiveness will shed insight into its potential as a therapeutic agent in hMSC application.	
Effects of Cisplatin on the Actin Cytoskeleton: Potential Target for Reducing Cytotoxicity and Enhancing Anti-Cancer Therapy, Amy Friesland, Qun Lu, East Carolina University, Greenville, NC 27858 Widely-used chemotherapy drugs, such as platinum, exhibit a high level of treatment-associated toxicity including neurotoxicity which is often dose limiting and can be devastating to a patient's quality of life long after the therapy ends. We have identified that suppression of RhoA signaling by p160ROCK/Rho kinase inhibitor Y-27632, which inhibits cancer cell motility and invasion, can reverse anti-cancer drug-induced neurodegeneration in the novel cisplatin-induced peripheral neuropathy (CIPN) mouse model developed in this laboratory. Y-27632 not only reduces CIPN in mice, but also increases the cytotoxicity of cisplatin-treated lung cancer cells in vitro, supporting the translational potential of a combination regimen as an improved therapeutic option. Understanding the mechanisms underlying this pathway to increase cancer-attacking efficacy will have significant impact since both platinum and Y-27632 have proven to be clinically safe and can expand into many anti-cancer drug applications. In the present study, we further studied the potential mechanisms by which cisplatin inhibited cell cancer proliferation but also resulted in neurodegeneration. Flow cytometry of H522 lung cancer cells treated with cisplatin for 24 hours showed a mitotic blockade in the transition of G1 to S phase. Release of cisplatin restored cell cycle to G2/M phase, indicating that drug treatment did not affect actin-mediated cytokinesis. Interestingly, treatment of cells with cisplatin for 2 and 6 hours, while showing no visible nuclear abnormality, resulted in retraction of cellular processes as well as rounding up, as demonstrated with phalloidin staining in PC3 prostate cancer cell lines. On the other hand, examination of peripheral nerve tissues of CIPN mice revealed the activation of small GTPases RhoA, supporting the actin cytoskeleton as a non-DNA target of	P47

cisplatin. These results support that multiple targets of cisplatin lead to both cancer-killing activity and neurotoxicity in patients receiving this chemotherapeutic agent. Supported by NIH NCI-CA111891 and NIA-AG026630.	
The Resurfacing Debate: Historical Perspectives to Multiple Entry-Levels to RN Practice, April Matthias, East Carolina University, Greenville, NC 27858 The purpose of this historical study is to understand the socio-cultural-political context surrounding the decisions to develop the diploma, BSN, and ADN educational pathways; the historical debate concerning the role and functions, educational pathway, and professional identity of the entry-level RN; and the relationship between the educational pathway developments and the resurfacing historical debate. The nursing profession in America has sustained a state of disorder. The debate within the disorder historically exists in relationship to the multiple educational pathways for entry into RN practice. This historical debate regarding the role and functions, educational pathway, and professional identity of the entry-level RN has resurfaced for greater than a century without resolution. The diploma, BSN, and ADN pathway still exist today as pathways to enter into nursing practice through RN licensure. Therefore, it seems reasonable if not imperative that the three educational pathways diploma, BSN, and ADN and the decisions, debate, and disorder surrounding them, be studied historically in relation to one another. Historical research surrounding the developments of the three educational pathways may be significant and even timely in that the evidence gleaned from the study may help to shed light on professional issues resurfacing in the current "BSN in 10" legislative proposals. Historical case study research focused on three educational pathways associated with the three historical decision points for the developments: Diploma - The Bellevue Training School for Nurses in New York, 1873; BSN - The University of Cincinnati in Ohio, 1916; and ADN - The Orange County Community College in Middletown, New York, 1952. Archival retrieval of primary documents for all three case studies has been completed. Primary documents illustrate that each entry-level educational pathway development created a new and different type or kind of nurse through a different education model. Analysis continues today and new questions are surfacing.	P48
The Lost Art of Cooking and Generation Y, Meagan Piland, Barbara Woods, Stacy West, Kylie Gearhart, Kimberly Heidal, Sarah Colby, East Carolina University, Greenville, NC 27858 Cooking is an art that is on the decline in the typical American home. On average 42% of calories are consumed outside the home. Individuals 25 or younger report allocating 50.6% of their food dollar to food away from home. When individuals transition into young adulthood, the skills needed for good nutrition are lacking. The purpose of this study was to assess traditional aged college	P49

students' ability, desire and current practice of home cooked meals. It was hypothesized that college aged students (18-24) did not prepare the majority of their meals. A convenient sample (n=354) at a moderate sized Southern university completed a College Life Survey that contained 172 questions. Data collected included medical history, years enrolled in college, current cooking practices, university meal plan and nutrition consumption using food categories. Data was analyzed using SPSS version 18. The average meals prepared per week by college students was 4.04±3.28 while eighty-five percent of students reported having the ability to cook. Fifty-seven percent of students had a university meal plan and 41% consumed fast-food more than 3 times per week. The findings of this survey support the idea that college-aged students do not prepare the majority of their meals and that they do not possess the desire or skills necessary to cook healthy from scratch meals. A larger study examining this issue would be beneficial for nutrition educators.	
Multidisciplinary teaching approaches to food science maintains student attitudes and improves efficacy, Sara McLeod, Virginia Carraway-Stage, Melani Duffrin The university system of North Carolina has experienced substantial growth, providing an opportunity for food and agriculture science focused programs to attract higher quality students to these fields. Providing access and quality experiences in foods courses can help retain interest in these disciplines. Incorporating innovative foods education techniques into food science courses can improve student synthesis and application of foundation knowledge and skills. The study objective was to enhance a sophomore-level food science course for Nutrition Science and Family Consumer Science majors through multidisciplinary approaches using food science as a tool to understand the nature of living systems and the promotion of healthy living. Food science course content was enhanced with a multidisciplinary approach to subject matter. Introductory food science knowledge content remained the core of the course content while incorporating information, materials, and activities that created relevance for the learner in the context of other disciplines such as nutrition, health, environment, and consumer science. Researchers developed a 30-item self efficacy survey and a 41-item attitudinal survey using a five point Likert scale (5=Strongly Agree; 1=Strongly Disagree) to assess students pre and post participation in the food science course (N=32). Cronbach alpha coefficient of internal consistency for the survey was 0.942 (self-efficacy items) and 0.876 (attitude items) at post-test. Significant improvements were identified for 18 of the 30 efficacy items at post-test ($p < .05$). Attitude scores remained consistent from pre to post test with the exception of improvement in ease of calculating the cost of a recipe ($p=0.001$, $SD=0.976$, $\mu=-0.625$). Maintaining positive student attitudes and improved efficacy towards challenging food science course content can serve to recruit and retain quality students to pursue careers in food, food science, nutrition, agriculture, biotechnology, and other related fields.	P50

Validation of a Dietary Intake Tool among African American Hemodialysis Patients, Alexis Briley, Melani Duffrin, East Carolina University, Greenville, NC 27858 The purpose of this study was to test the reliability and validity of a dietary renal SPAN tool developed specifically for hemodialysis patients. A pilot test utilizing a small population of 30 African American, hemodialysis patients were recruited from a dialysis center in Rocky Mount, North Carolina. These subjects then completed a food frequency dietary renal SPAN tool first and then a 24-hour dietary recall was performed on the same patient, in which both tools reflected the dietary intake from the same day. The tool focused on problematic foods frequently consumed by this target population. SPSS tests were run to examine the reliability and validity of the dietary tool by comparing it against a 24-hr recall, which was reviewed by three different registered dietitians. The results from this study will help clinicians provide better nutrition education, promote compliance with the renal diet, and improve overall quality of life among this population.	P51
Approved Nutrient Content Claims and Health Claims; Effect on Consumer Perception and Purchase Behaviors, Shelley Opremcak, East Carolina University, Greenville, NC 27858 Nutrient content claims describe the level of a specific nutrient within a food, and function to improve consumer understanding of the nutritional composition of foods. The National Labeling Education Act states the primary purpose of nutrient content claims and health claims is to promote healthy choices, however current literature from the American Dietetic Association and the Food and Drug Administration report a need for further investigation of consumer interpretation of nutrition claims. The influence of nutrient content claims and health claims on consumer perception of product nutrition was examined using a cross-sectional, survey research design. Participants completed a card-sorting activity that involved examining a variety of healthy and unhealthy products and responding to interview questions. The prevalence of nutrient content and health claims on products at local grocery stores was assessed prior to the study, and 12 products containing at least one nutrition claim each were selected. The products were defined as "healthy" or "unhealthy" using FDA based standards. Two card sets were developed, set A and set B. Card set A contained 12 photos of products, half of which had the nutrient content claim or health claim removed. Card set B contained the same 12 product photos, however the nutrition claims were removed from the opposite six products as card set A. Each product card contained a color photo of the product package on the front side, and the complete nutrition facts panel on the backside. Individuals were randomly assigned to card set A or card set B, and were asked two questions about each product; (1) would you purchase this product, and (2) is the product healthy? Responses were recording using a likert scale ranging from 1-5 where 1 is strongly disagree and 5 is strongly agree. Difference scores will be computed by subtracting the scores of the products without nutrition claims from the products with nutrition claims. Multivariate models will be used to assess relationships between the sociodemographic variables and the difference scores. The influence of	P52

marketing on consumer perception of product health will be examined using a series of correlations, using significance level of $p<0.05$. PASW version 18 will be used to conduct the statistical analysis.	
Health Locus of Control and Coaches, Danielle Harmon, East Carolina University, Greenville, NC 27858 The Multidimensional Health Locus of Control Scale (MHLC) is a tool widely used by researchers to determine whether individuals are influenced by three factors: internal, powerful external others, and chance. The MHLC Scale consists of three forms: Form A, Form B, and Form C. The purpose of this research was to explore if coaches take responsibility for their health through the MHLC. The MHLC Scale, Form A consists of 18 questions with six-item subscale questions focused on the three factors of individuals beliefs. The study is based on a sample of 10 coaches from different areas of NC. Participants were on volunteer base. Based on the analysis of the surveys, with a MHLC Scale Score Model, it was evident that many coaches identified themselves to be more internally influenced towards their health behaviors, followed by powerful others as the second highest factor.	P53
Regression Equations for Skinfolds with DXA as Standard, Dustin Raymer, East Carolina University, Greenville, NC 27858 Assessment of body fat (%fat) is an important tool for risk stratification and sport participation. Skinfold assessment of %fat is classified as a "doubly indirect" method because equations were based on hydrostatic (indirect) weighing (HW) as the criterion. HW has long been considered the "gold standard" for assessment despite the fact that it is challenging to get reliable results. The SEE for HW is ~+ 2.5%. Dual X-Ray Absorptiometry (DXA) is a newer technique which shows promise because subject compliance is not an issue and it is a 3-compartment model which should improve accuracy over HW. The SEE for DXA is ~+ 1.8%. The purpose of this study was to create skinfold regression equations that predict %fat with DXA as the standard. Methods: 222 Caucasian Men participated in the study. DXA %fat was determined using a Lunar Prodigy Advance system. Skinfolds were taken from technicians trained by the same instructor. Conclusion: DXA related skinfolds will use age, tricep, abdominal and thigh as the three locations to predict %fat. The equation is as follows: 8.35991721156564 + (0.0890012875629363 * Age) + (0.397224808083077 * Tricep) + (0.223799731908348 * Abdominal) + (0.220693466179482 * Thigh)	P54

Vestibular and Ocular Motor Function Following Blast Injury, Kristal Mills, Stephanie Cole, Andrew Stuart, Timothy Jones, Sherri Jones, East Carolina University, Greenville, NC 27858 The war on terror has produced over 30,000 wounded troops with approximately 68% of injuries attributed to blasts (Dept. of Defense, 2010; Chandler, 2006). Dizziness and imbalance are common complaints among blast injured (BI) military personnel. The purpose of the study was to characterize vestibular and oculomotor function in military personnel less than one year post blast (N = 33) and greater than one year post blast (N = 60). Overall, 33 of the 93 participants exhibited normal findings on all test results (less than one year, N = 10 and greater than one year, N = 23). Ocular motor abnormalities (OMA) were the most common finding with 51 of 93 participants demonstrating at least one abnormal finding. Saccadic latency was the most commonly observed OMA with mean latencies of 178 ms for those classified as normal and 345 ms for those with OMA. Less than 1 year post-blast, 7 out of 33 (21%) exhibited findings consistent with a unilateral weakness (UW). One participant in this group had findings consistent with a bilateral weakness (BW). Greater than 1 year post blast group, 4 participants (6%) showed a UW and 11 (18%) had findings suggestive for a BW. All participants were able to visually suppress the vestibular ocular reflex (VOR) and the vast majority (95%) could also visually enhance VOR gain. Vestibular evoked myogenic potentials were normal in 42 of the 47 participants tested suggesting that saccular function is not significantly affected by blast exposure. The Dizziness Handicap Inventory and the Activities-specific Balance Confidence scales were poor indicators of peripheral vestibular status. Participants reported symptoms and case history did not predict test outcomes. Overall, the findings suggest that peripheral vestibulopathy is not prevalent following BI at least during the time frame tested here (4 months to 5 years post blast); however, ocular motor abnormalities are common in the BI population.	P55
Bariatric Surgery, Insulin Secretion, And Insulin Sensitivity In Type 2 Diabetics: Role Of Proximal Small Intestine Bypass. CI Amato, MA Reed, WJ Pories, WH Chapman, JR Pender, H Barakat, T Green, E Tapscott, CA Tanner, RH Peacock, TP Gavin, and GL Dohm, East Carolina University, Greenville, NC 27858 Bariatric surgery is an effective, rapid, and durable treatment for obesity and type 2 diabetes (T2DM). Roux-en Y Gastric Bypass (RYGB) resolves T2DM in 80% of cases, while gastric banding (LAGB) resolves T2DM in only 45%. One significant difference between RYGB and LAGB is the bypassing of the proximal small intestine in RYGB. Inadequate insulin secretion and insulin resistance are well known contributors to T2DM and both improve following RYGB. PURPOSE: To determine if RYGB produces greater improvements in insulin secretion and insulin sensitivity than LAGB in T2DM. METHODS: Obese, T2DM, Caucasian women underwent RYGB (N=8) or LAGB (N=3). Insulin secretion (AIRg) and insulin sensitivity (Si) were measured pre- and 1-wk post-surgery by an insulin modified intravenous glucose tolerance test (IVGTT). Post-surgery	P56

analysis at 1-wk eliminates the potential contribution of differences in weight loss or food consumption as these are rigorously controlled for 1 wk following these surgical procedures. RESULTS: From our preliminary data, Si improvements may be similar following RYGB (Pre: 0.76 +/- 0.16 AU and 1-wk: 2.30 +/- 0.43 AU) and LAGB (Pre: 1.2 AU and 1-wk: 2.87 AU). However, AIRg may be improved more by RYGB (Pre: 42.0 +/- 23.3 and 1-wk: 94.7 +/- 52.6) than LAGB (Pre: 23.0 and 1-wk: 11.9). CONCLUSIONS: From our preliminary results in obese, T2DM, Caucasian women suggest that insulin sensitivity may be increased similarly in RYGB and LAGB questioning the role of the proximal small intestine bypass in the reversal of insulin sensitivity following bariatric surgery. In contrast, improvements in insulin secretion may be greater in RYGB than LAGB. Additional gastric banding patients are required to provide adequate power for statistical analysis .	
Bariatric Surgery And Insulin Sensitivity In Obesity: Role Of Proximal Small Intestine Bypass, RH Peacock, MA Reed, WJ Pories, WH Chapman, JR Pender, H Barakat, T Green, E Tapscott, CA Tanner, CI Amato, TP Gavin, FACSM and GL Dohm, East Carolina University, Greenville, NC 27858 Bariatric surgery is an effective, rapid, and durable treatment for obesity. Insulin resistance is well known to occur in obesity. Roux-en Y Gastric Bypass (RYGB) and gastric banding (LAGB) improve insulin resistance; however these improvements may be greater following RYGB. One significant difference between RYGB and LAGB is the bypassing of the proximal small intestine in RYGB. Whether differences in the improvement in insulin sensitivity are due to differences in intestinal bypass, food intake, or weight loss following bariatric surgery is unknown. PURPOSE: To determine if RYGB produces greater improvements in insulin sensitivity than LAGB in obese. METHODS: Obese, Caucasian women underwent RYGB (N=8) or LAGB (N=1). Insulin sensitivity (Si) was measured pre-op, 1-wk post-op, and matched for weight loss (Match WL) post-op (3-mo for RYGB and 6-mo for LAGB) by an insulin modified intravenous glucose tolerance test (IVGTT). Post-surgery analysis at 1-wk eliminates the potential contribution of differences in food consumption as this is rigorously controlled for 1 wk following both surgical procedures. RESULTS: From our very preliminary data, Si improvements may be similar following RYGB (Pre: 2.94 +/- 1.02 AU; 1-Wk: 2.21 +/ 0.42 AU; and Match WL: 3.88 +/- 1.12) and LAGB (Pre: 2.11 AU; 1-Wk: 2.30 AU; and Match WL: 8.20). CONCLUSIONS: Our very preliminary results in obese, Caucasian women suggest that insulin sensitivity may be increased similarly in RYGB and LAGB questioning the role of proximal small intestine bypass in the reversal of insulin sensitivity following bariatric surgery.	P57

Transcriptional regulation of skeletal muscle GLUT4 by elevated long chain fatty acids, Laura Rice, Morgan Pearce, Terry Jones, Jonathan Williams, East Carolina University, Greenville, NC 27858 A high-fat diet plays a role in insulin resistance and suppresses the expression of the glucose transporter 4 (GLUT4) in skeletal muscle. The objective of this study was to determine the effect of individual long chain fatty acids on transcriptional activity of the human GLUT4 promoter. We used a full-length human GLUT4 promoter with a luciferase reporter transfected into rat skeletal muscle (L6) cells. Transfected myotubes were exposed to individual long chain fatty acids, both saturated and unsaturated and cis- and trans-confirmation. The fatty acids tested either had no effect on transcriptional activity or reduced transcriptional activity up to ~40%. Any decrease in GLUT4 expression in skeletal muscle results in a deleterious effect on glucose transport into skeletal muscle. On the other hand, increased cytosolic calcium, as seen with muscle contraction, regulates the human GLUT4 promoter by increasing GLUT4 expression in L6 cells up to 70% higher than control cells. An increase in GLUT4 results in increased transport into skeletal muscle. We exposed L6 cells to these particular fatty acids and then increased cytosolic calcium to see if there was altered GLUT4 transcriptional activity in the presence of each elevated fatty acid and increased calcium. Rescue of GLUT4 transcriptional activity in the presence of elevated fatty acids by increased calcium suggests that muscle contraction may play a role in ameliorating the consequence of elevated fatty acids resulting from a high-fat diet and/or obesity.	P58
Is Insulin Sensitivity Related to Skeletal Muscle Mitochondrial Function in Type II Diabetes? JM Ernst, HB Kwak, RD McKernie, AH Clark, P Brophy, M Dar, WE Pofahl, GL Dohm, TP Gavin, East Carolina University, Greenville, NC 27858 Type II Diabetes Mellitus (T2DM) is characterized by hyperglycemia and hyperinsulinemia. Insulin sensitivity and skeletal muscle mitochondrial content are reduced in T2DM patients. PURPOSE: To determine if insulin sensitivity is correlated with skeletal muscle mitochondrial function in T2DM. METHODS: Insulin sensitivity was assessed by the homeostatic model assessment (HOMA) from fasting glucose and insulin, where low HOMA translates to high insulin sensitivity. Mitochondrial function was determined from permeabilized fibers from vastus lateralis biopsies in T2DM patients (N = 4). RESULTS: There was a significant correlation identified between HOMA and the ratio of State 3 to State 2 respiration, an index of respiratory control. ($r = 0.96$; $p = 0.04$). CONCLUSIONS: Lower insulin sensitivity is correlated with lower skeletal muscle mitochondrial function in T2DM.	P59
Changes in running velocity result in changes in negative and positive lower extremity joint work, Jonathan Goodwin, Jon Cole, East Carolina University, Greenville, NC 27858 INTRODUCTION: Joint work is analyzed during the stance phase of gait as a partial measure of	P60

energetics during running. When running velocity is changed, there is likely a change in the amount of work in the lower extremities. It is not known how work changes with instantaneous changes in velocity. The purpose of this study is to compare the positive and negative work at the ankle, kne, and hip during acceleration, deceleration and steady state running. METHODS: Five individuals who regularly perform physical activity were recruited. Retroreflective markers were placed bilaterally on the subject's lower extremities. Kinematic data were collected with a 9-camera motion analysis system. Ground reaction force was collected from 2 force plates. The subjects ran with their normal gait pattern in acceleration, deceleration, and steady state. Subjects were asked to begin accelerating or decelerating at a specific point on the runway prior to hitting the force plates. 3D joint kinematics and kinetics were calculated with Visual 3D software. Joint work was calculated from sagittal plane power data for the ankle, knee, and hip. Single factor ANOVAs (p= 0.05) were used to determine differences across the three conditions for sagittal plane positive and negative work at each of the joints. RESULTS: No differences were found for knee or hip positive work across conditions. Ankle positive work decreased during deceleration (0.74W/kg) when compared to acceleration (1.09 W/kg) and steady state (1.09 W/kg). However, both knee (-0.47 W/kg) and hip (-0.08 W/kg) negative work decreased during acceleration when compared to deceleration (K:-0.76 W/kg, H:-0.18 W/kg) and steady state (K:-0.66 W/kg, H:-0.16 W/kg). There was a trend (p=0.08) toward decreased negative work during deceleration (-0.64 W/kg) in the ankle when compared to acceleration (-0.81 W/kg) and steady state (-0.87 W/kg). DISCUSSION: The decrease in ankle positive work during deceleration is due to lack of propulsion during this type of running. During propulsion, it appears that hip and knee do not play different roles across conditions. However, they play an important role in providing negative work during deceleration and steady state running. Training techniques specific to the muscles that create this work may aid in performance and injury reduction during sport.	
Sigma-Feature Based Online Face Recognition, Muhammad Mehdi, East Carolina University, Greenville, NC 27858 The major era of advancements in face recognition started in 1990 demonstrating that a simple neural network could perform face recognition for aligned and normalized face images. The type of network they employed computed a face description by approximating the eigenvectors of the face image's autocorrelation matrix; these eigenvectors are now known as Eigenfaces. Biometric SDKs have been used for very long time to process the static background images. But now with the requirement and advance devices involved these SDKs are restricted to finger prints and iris recognition. Basically Eigenfaces use the number of images of the same subject to combine the Eigenvalues of all images and identify the darker parts/features of the face. So it was found convenient to use the already existing algorithm for initial face and feature detections. A study was carried out to find the replacement for Eigenfaces in order to improve the speed of face and its feature identification. OpenCV library came out as a help as its built-in image processing functions provide a good interface to work on by giving an open access to the live video feed as 25	P61

frames/images per second at a very fast speed. Having Eigenfaces and Pixel displacement rule as the basis of the research project, the sigma feature of rastorization graph developed by our team was used to identify the features of different images or faces from live video feed. As for the recognition part, training images (Image database available online, provided by FERET and University of Oxford) from already existing databases were used and then tested on the subjects linked to this project and a very good accuracy percentage was obtained. Combined pixel displacement rule and rastorization graph produced results with faster recognition rate than the existing methods.	
Implementation of a Practical Public Key Cryptosystem Provably Secure against Adaptive Chosen Ciphertext Attack, Steven Ulrick, East Carolina University, Greenville, NC 27858 In 1998, Ronald Cramer and Victor Shoup developed a cryptosystem that is provably secure against adaptively chosen ciphertext attacks while still having the benefit of being a practical scheme. This is a significant breakthrough considering that even the popular RSA Cryptosystem and El Gamal cryptosystem are defenseless against adaptively chosen ciphertext attacks. The security of Cramer-Shoup cryptosystem is based on the assumption that the the Diffie-Hellman decision problem is intractable. We present an implementation of the Cramer-Shoup cryptosystem in C++ programming language developed in the Visual Studio Environment. We used NTL (Number Theory Library) to deal with arbirtrary precision integer arithmetic.	P62
On-Board Sound Intensity Noise Measurements of North Carolina Pavements, Richard Shores, Josh Botts, East Carolina University, Greenville, NC 27858 Mitigation of traffic noise has become increasing important consideration for highway agencies when constructing new highways or improving the existing systems. As a competitive alternative for noise mitigation, quieter pavement may provide advantages that noise barriers do not have, or to where sound barriers are not suited. The first step in developing quieter pavement is identifying the noise levels of different types of highway pavements, which is divided into three major tasks: (i) the development or selection of the appropriate measuring method to capture tire-pavement noise from the source; (ii) the selection of appropriate testing procedures excluding disruptive external impacts; (iii) proper data analysis to provide pertinent direction in developing quieter pavement. This poster describes the OBSI equipment established at East Carolina University and the tire-pavement noise measurement plan in North Carolina.	P63
Effects of six-week static and dynamic hamstring stretching programs on hamstring flexibility and lower extremity biomechanics, Lee Welch, Christina Pate, Dustin Turner, East Carolina University, Greenville, NC 27858	P64

INTRODUCTION: Decreased hamstring flexibility has been linked to a greater incidence of running injuries. Two stretching techniques that are commonly used among athletes are static and dynamic hamstring stretches. Static stretching involves taking the muscle to its end range and maintaining this position for a period of time. Dynamic stretching involves moving the muscle to its end range and back to its starting position in a smooth controlled manner. Evidence has suggested that dynamic stretching may have more of a positive impact on athletic performance than static but is less effective at increasing hamstring flexibility. The purpose of this study is to compare static and dynamic hamstring stretching on static hamstring flexibility and running biomechanics. METHODS: The study included 15 subjects ranging from age 18-50. All subjects ran a minimum of 6 miles per week. All subjects had tight hamstrings classified as > 25 degrees from zero where zero is full knee extension with the hip flexed to 90 degrees. Static hamstring flexibility was measured using a goniometer. Dynamic hamstring flexibility was measured using a 3-dimensional running analysis consisting of a 9-camera motion analysis system. The subjects were randomly placed into a control group, a static stretch group, or a dynamic stretch group and data was collected initially and after a 6 week stretching program. 3D joint kinematics and kinetics were calculated with Visual 3D software specifically for sagittal plane hip and knee flexion at heel strike. Two-factors ANOVAs ($p=0.05$) were used to compared pre-post intervention across the three groups for static range of motion, sagittal plane knee and hip angle at heel strike. RESULTS: No differences were found between the 3 groups for dynamic knee flexion at heel strike. Statistically significant differences were observed for dynamic hip flexion at heel strike for the dynamic stretch group, and for static hamstring flexibility for the dynamic and static stretch groups ($p<0.05$). There was no difference for the static stretch group on dynamic hip flexion. DISCUSSION: Static hamstring stretching appears to increase static flexibility but not dynamic flexibility, while dynamic stretching appears to increase both static and dynamic hamstring flexibility. This may have implications for athletes that want to improve dynamic flexibility.	
The effect of foot orthotic devices on lower extremity coupling when landing from a jump, Jeanne Graf, Hannah Bendahmane, East Carolina University, Greenville, NC 27858 INTRODUCTION: Female athletes injure the Anterior Cruciate Ligament (ACL) of the knee 2-8 times more frequently than male athletes when performing similar activities. Landing from a jump is one mechanism of injury for the ACL. Research suggests that females utilize a different landing strategy than males when landing from a jump. Currently ACL prevention research has been focusing on kinematics at the hip, or knee, or ankle during jump landings. There is a dearth of research that examines the joint coupling in the lower extremities during landing. The purpose of this study is to examine the effects of a foot orthotic device (FOD) on frontal and traverse plane motion at the ankle, as well as coupling of these motions, in male and female subjects performing a jump landing. We hypothesize that the FOD will decrease frontal plane ankle eversion and transverse plane tibial internal rotation in females. METHODS: 33 healthy physical therapy students (16 female, 17 male, μ age=24) with no history of lower extremity injury participated. Subjects were	P65

randomly assigned to perform 10 consecutive jumping trials with and without FODs. Kinematic data were collected using an 8-camera motion analysis system. Data was reported from foot contact to 0.13 seconds following foot contact. 3D joint kinematics were calculated with Visual 3D software. RESULTS: When comparing the FOD to the no FOD conditions, a significant decrease in tibial internal rotation (TIR) was demonstrated (p=0.00) in females but not in males. Comparison between males and females demonstrated significant differences in frontal plane ankle eversion (EV) excursion (p = 0.00) and in the ratio of ankle eversion to tibial internal rotation excursion (EV:TIR) (p=0.01). DISCUSSION: When landing from a jump, females demonstrated significantly more ankle eversion than males. Females also demonstrated a decrease in tibial internal rotation when wearing a FOD. Previously we found differences in frontal and transverse plane hip joint kinematics between genders, and gender differences in transverse and hip joint kinematics with the use of FOD. The current study appears to demonstrate gender differences can occur distally as well as proximally, and that females may land differently when using a FOD.	
Divided-attention Responses in Older vs Younger Adults Following Training with Multi-directional Stepping or Endurance and Leg Strengthening, Samantha Moore, East Carolina University, Greenville, NC 27858 Approximately 35-40% of generally healthy and independent persons aged 65 years or older experience a fall at least once a year. Particularly in situations when an individual is performing two tasks at the same time, such as a physical task and a cognitive task, it may be necessary to take a rapid step to prevent a fall. Older adults are at an increased risk of falling due to an impaired ability to initiate and execute quick, accurate voluntary steps when compared to young adults. The purpose of this study was to determine if training healthy older individuals using a divided-attention timed stepping accuracy task (DATSAT) incorporating a voluntary stepping and cognitive demand would improve performance in divided-attention situations when compared with younger healthy adults. Thirty healthy older (HO) adults (> 65 y.o.) and thirty healthy younger (HY) adults (< 30 y.o.) participated in the study. Participants were randomly assigned to either the Stepping group or the Bike and Strength (B&S) group. The Stepping group performed 12 sets of 8 repetitions of rapid multi-directional stepping in a divided-attention situation while the B&S group completed 15 minutes of stationary biking and 12 sets of 8 repetitions of progressive lower extremity strengthening exercises. Both training sessions were performed 3 x per week for 6 weeks. Pre- and posttest performance measures included the dual-task timed up and go (DTTUG) test and the DATSAT which included time to complete the task, accuracy errors, and movement errors. The statistical analysis included a 3-factor ANOVA (training, age, time) with an alpha level set at 0.05. With regard to the DTTUG, the HO improved significantly more than the HY regardless of training. There were no significant differences based on the type of training. The results for average time to complete the DATSAT demonstrated that the HO improved significantly more than the HY regardless of the training, and the Stepping groups improved significantly more than the B&S	P66

groups regardless of age. Examining accuracy errors on the DATSAT, the Stepping groups improved significantly more than the B&S groups regardless of age and there was not a significant difference based on age. There were no significant differences based on age or training for movement errors on the DATSAT.	
Role of ACSL1 in Mitochondrial Skeletal Muscle Fatty Acid Oxidation in Human Skeletal Muscle, Rocio Ellis[1], Julie Cox[1], Robert C. Hickner[1], Hyo-Bum Kwak[1], Tracey Woodlief[1], Ronald N. Cortright[1,2] [1]Department of Exercise and Sport Science and [2]Physiology, East Carolina University, Greenville, NC 27858 Obesity is considered a major health threat to the U.S. due to being a strong risk factor for developing type 2 diabetes and other metabolic diseases. The prevalence and severity of obesity is even greater among African-American Women (AAW). Metabolic dysfunction observed in obese AAW may be associated with an impairment of mitochondrial fatty acid oxidation (mtFAO) due to the recently identified reduction of long chain acyl-CoA synthetase (ACSL) activity. ACSs exists as five different isoforms, the roles of which are to activate fatty acids to acyl-CoAs in the initial step of fatty acid metabolism (synthesis or oxidation). In liver of rodents, ACSL-1 has been thought to direct fatty acids toward mtFAO, but its function is unknown in human skeletal muscle. Purpose: To understand the role of ACSL-1 activity in mtFAO in primary human skeletal muscle cells (HSKMC). To address the purpose of the study, we employed a model for over-expression (ACSL-1 OEX) and under-expression (ACSL-1 UEX) of ACSL-1 in HSKMC. Hypothesis: Overexpression would elevate, and under-expression of ACSL-1 would reduce, mtFAO. Methods: Primary human skeletal myoblasts isolated from vastus lateralis of six obese AAW (for ACSL-1 OEX; BMI 35 ± 3.1) and six lean Caucasian women (for ACSL-1 UEX; BMI 23 ± 0.9), were transfected (Amaxa Nucleofector) with ACSL-1 plasmid DNA or shRNA respectively, differentiated into myotubes, and harvested (7d). Rate of mtFAO was assessed in using [1-14 C] palmitate. Results: ACSL-1 OEX significantly elevated mtFAO by approximately 2-fold ($P < 0.05$) in HSKMC from obese AAW. Conclusion: This is the first report suggesting a role for ACSL-1 in human skeletal muscle mtFAO. We predict a reduction in mtFAO with ACSL-1 UEX in HSKMC from lean Caucasian women; experiments are ongoing. Supported by NIH DK075880 (RNC).	P67
Strength & Endurance Changes in Healthy Older Adults versus Healthy Younger Adults After Six-Weeks Using Different Training Programs, Katherine Schendt, Sue Leach, East Carolina University, Greenville, NC 27858 Falls in the elderly are a major problem in healthcare which will continue to grow as it is expected	P68

that 20% of the population will be over age 65 in 2030. 30% of all elderly fall each year and of these half will fall recurrently. Declines in muscular strength and endurance are important risk factors for falling. Enhancing lower body strength could be a long-term alternative to help community-dwelling older adults remain functional and reduce their vulnerability to falls. The purpose of this study was to compare strength and endurance between healthy older adults and healthy younger adults before and after a 6-week training period using two different training programs. Participants were 30 community-dwelling healthy older adults (65+ yo) recruited from greater Greenville, NC, and 30 healthy younger adults (18-30 yo) recruited from the ECU Campus. Participants were randomly assigned to either the bike & strength (B&S) or stepping (SS) groups before completing the pretest. Endurance was measured by the 6-minute walk test (6MWT) and strength was measured via a 1-repetition maximum (1RM) test for ankle plantarflexion/dorsiflexion, knee flexion/extension, and hip extension/abduction. The training programs occurred 3 times per week for 6 weeks. The warm-up for both groups consisted of 5 minutes on a stationary bike at a comfortable pace and a standardized stretching routine. The B&S group performed 15 minutes on a stationary bike at 60-70% maximum heart rate followed by 12 sets of 8 repetitions of a bilateral lower extremity strengthening routine progressing from 60-80% of 1RM during the study. The SS group completed 12 sets of 8 repetitions of a divided-attention timed stepping accuracy task as quickly as possible. The posttest was performed within one week of completing last training session. The statistical analysis included a 3 factor ANOVA (training, age, time) with an alpha level set a 0.05. The results showed that all groups improved in strength and endurance, as measured by 1RM and 6MWT respectively, regardless of the training program. The B&S training groups improved more in strength measures compared to the SS groups, whereas the SS groups improved more in the endurance measure.	
Balance Responses in Older and Younger Adults Following Training using Multi-directional Stepping or Strength and Endurance Protocols, Trudy Bundy, East Carolina University, Greenville, NC 27858 Falls are a major concern for older adults with more than 1/3 older adults falling yearly. Balance is a good predictor of falls and improving balance will decrease fall risk. Rapid stepping ability is associated with fall risk and older adults utilize a stepping strategy to regain balance more often than younger adults. The purpose of this study is to compare balance responses in older and younger adults following training on the divided-attention timed stepping accuracy task (DATSAT), which involves rapid multi-directional stepping to distances based on 60% and 80% of each individual's maximum step length (MSL), versus more traditional strength and endurance (SE) training. Thirty healthy younger (HY) adults (18-30 y.o.) and thirty healthy older (HO) adults (> 65 y.o.) were randomly assigned to either the DATSAT group or the SE group. Training sessions were performed 3 x per week for 6 weeks. The DATSAT group performed 12 sets of 8 repetitions of rapid multi-directional stepping in a divided-attention environment while the SE group pedaled a stationary bike for 15 minutes at 60% maximum heart rate and completed 12 sets of 8 repetitions of leg	P70

strengthening exercises progressing from 60% to 70% to 80% of 1 repetition maximum of the following muscle groups: ankle dorsiflexion, ankle plantarflexion, knee extension, hip abduction, hip extension, and knee flexion. Pre- and posttest measures included the Berg Balance Scale (BBS), the Timed Up and Go (TUG), and the Functional Reach Test (FRT). The statistical analysis included a 3 factor ANOVA (training, age, time) with an alpha level set at 0.05. The results showed that the HY adults have significantly better balance scores at pretest on the BBS, the TUG and the FRT compared to the HO adults. Although there were improvements within the groups from pretest to posttest on these measures, there were no significant differences in the amount of improvement between the HY and HO groups from pretest to posttest or between the DATSAT and SE groups. Balance can be improved at different ages in the lifespan using different training modalities.	
Nanoparticles affect the growth and microRNA expression in plants, Caitlin Burklew, Taylor Frazier, Guiling Sun, Baohong Zhang, East Carolina University, Greenville, NC 27858 Titanium Dioxide (TiO_2) is one of the most widely used pigments in the world. Due to its heavy use in industry and daily life, such as food additives, cosmetics, pharmaceuticals, and paints, many residues are released into the environment and currently TiO_2 nanoparticles are considered an emerging environmental contaminant. Although several studies have shown the effect of TiO_2 nanoparticles on a wide range of organisms including bacteria, algae, plankton, fish, mice, and rats, little research has been performed on land plants. In this study, we investigated the effect of TiO_2 nanoparticles on the growth, development, and gene expression of tobacco, an important economic and agricultural crop in the southeastern United States as well as around the world. We found that TiO_2 nanoparticles significantly inhibited the germination rates, root lengths, and biomasses of tobacco seedlings after 3 weeks of exposure to 0.1%, 1%, 2.5%, and 5% TiO_2 nanoparticles and that overall growth and development of the tobacco seedlings significantly decreased as TiO_2 nanoparticle concentrations increased. Overall, tobacco roots were the most sensitive to TiO_2 nanoparticle exposure. Nano-TiO_2 also significantly influenced the expression profiles of microRNAs (miRNAs), a recently discovered class of small endogenous non-coding RNAs (~20-22 nt). miRNAs are considered important gene regulators and have been shown to play an important role in plant development as well as plant tolerance to abiotic stresses such as drought, salinity, cold, and heavy metal. Low concentrations (0.1% and 1%) of TiO2 nanoparticles dramatically induced miRNA expression in tobacco seedlings with miR395 and miR399 exhibiting the greatest fold changes of 285 fold and 143 fold, respectively. The results of this study show that TiO_2 nanoparticles have a negative impact on tobacco growth and development and that miRNAs may play an important role in tobacco resistance to heavy metals/nanoparticles by regulating gene expression.	P71
Establishing a Signature for Polycyclic Aromatic Hydrocarbons from the Deepwater Horizon Oil Release, to Trace in Marine-to-Land Transport, Kimberly Scalise, Siddhartha Mitra, East	P72

Carolina University, Greenville, NC 27858 Previous research suggests that marine organic matter may be transported onto land via precipitation and storm events originating over marine systems. The 2010 Deepwater Horizon disaster in the Gulf of Mexico released a surface slick of crude oil extending to ~176,000 km^2. Many of the compounds in crude oil are toxic and/or carcinogenic. Hence, there is concern that some petroleum-derived toxic and carcinogenic hydrocarbons from the spill may have been transported landward to the Gulf Coast States. For this reason, it is important to determine the fate of these oil-derived compounds and quantify their potential landward transport via atmospheric processes. In order to effectively quantify marine-to-land transport of the oil release-derived hydrocarbons, it is critical to first establish a signature of the oil. With that in mind, the first objective of this study is to find a signature of the Deepwater Horizon oil release. Polycyclic aromatic hydrocarbons (PAHs) are one suite of organic compounds that have been used to fingerprint oil. In this study, the relative abundance of ~35 polycyclic aromatic hydrocarbons (PAHs) specifically derived from the Deepwater Horizon oil release will be compared to the same PAHs found in oil from ocean basins outside the Gulf of Mexico. These PAHs will be extracted from the oil samples using an accelerated solvent extractor. The extracts will be purified and then the PAHs will be quantified using gas-chromatography coupled to mass spectrometry. Preliminary results suggest that the Deepwater Horizon oil is enriched in lower molecular weight PAHs and alkylated PAHs relative to their parent homologs. Future research will involve comparing the PAH signature of the Deepwater Horizon oil release to the PAH distributions in air and water samples collected from several sites on land in the Gulf Coast States.	
Different kinds of habitat complexity alter predator-prey interactions in different ways, Jon Davenport, David Chalcraft, East Carolina University, Greenville, NC 27858 Habitat complexity has often been viewed as an important factor that can reduce the impact of predators on prey by providing refugia for prey. Sit-and-wait predators, however, may perform better in complex environments that provide more perches or hiding places for the predator. We conducted an experiment in artificial ponds to examine how different kinds of habitat complexity (amount of leaf litter versus amount of emergent vegetation) influence the effect of a sit-and-wait predator (larval dragonflies; Anax spp.) on fitness components of larval salamanders (Ambystoma opacum). We expected increasing amounts of emergent vegetation to enhance the effect of Anax on A. opacum fitness while increasing amounts of litter would reduce the effect of Anax on A. opacum fitness. Leaf litter and emergent vegetation amount had no effect on A. opacum survivorship in ponds with no Anax. Anax reduced A. opacum survivorship but the extent of reduction depended on the amount and kind of habitat complexity present. Specifically, increasing amounts of emergent vegetation in ponds with low amounts of litter enhanced the negative effect of Anax on A. opacum survival. The amount of litter present did not alter the effect of Anax on A. opacum survival except	P73

when there was a low amount of emergent vegetation present - in this case it reduced the effect of Anax on A. opacum survival. Our results demonstrate that different kinds of habitat complexity can alter predator-prey interactions in different ways - in some ways it benefits the predator while in others it benefits prey.	
Distribution of Diagnostic Carbon Fixation Genes in a Deep-Sea Hydrothermal Gradient Ecosystem, Heather Blumenfeld, Matthew Schrenk, William Brazelton, Cody Cutler, Sarah Chowdhury, East Carolina University, Greenville, NC 27858 The walls of deep-sea hydrothermal vent chimneys sustain steep thermal and chemical gradients resulting from the mixing of hot (>300°C) hydrothermal fluids with cold, oxygenated seawater. The chemical disequilibrium generated through this process has the potential to drive numerous chemolithoautotrophic microbial metabolisms; many have been demonstrated to be operative in pure cultures. In addition to the well-studied Calvin Cycle, at least five additional pathways have been discovered. Most of the newly discovered pathways have been found in thermophilic and hyperthermophilic Bacteria and Archaea, well represented in microbial diversity studies of hydrothermal environments. To date, little is known about the distributions or environmental controls upon the utilization of various carbon fixation pathways. The overlap of limited microbial diversity with distinct habitat conditions in chimney walls provides an ideal setting to explore these relationships. Multiple chimney structures were recovered from the Juan de Fuca Ridge in the northeastern Pacific and analyzed using PCR-based assays. Earlier work showed elevated microbial abundances in interior portions of mature chimney walls, with an increasing ratio of Archaea to Bacteria from the outer to inner portions of the chimneys. Common phylotypes identified in these regions included Epsilonproteobacteria, Gammaproteobacteria, and Desulfurococcales. Genomic DNA was extracted from mineralogically distinct niches of these structures and queried for genes coding key regulatory enzymes for each of the well studied carbon fixation pathways. Preliminary results show the occurrence of genes representing the rTCA Cycle (aclB), Calvin Cycle (cbbM) and Methanogenesis (mcrA) a proxy for the Reductive Acetyl-CoA Pathway within interior portions of mature hydrothermal chimneys. Representative samples have been cloned and ongoing analyses are aimed at sequencing distinct genotypes of these genes within the hydrothermal chimney gradients. Molecular biological results are being compared to chemolithoautotrophic enrichment cultures obtained from the same chimney materials. These data are being compared to a broad array of contextual data to provide insight into the environmental and biological controls upon the distribution of the various carbon fixation pathways.	P74
Understanding biodiversity: testing species boundaries within North American tarantula diversity (*Araneae, Mygalomorphae, Theraphosidae*),Christopher Hamilton, Jason Bond, East Carolina University, Greenville, NC 27858	P75

In order to understand biodiversity, we need to understand the patterns and processes that created what we see today. The North American tarantula genus Aphonopelma comprises the most speciose tarantula genus on Earth, with 90 recognized species throughout its range and 54 residing in the United States. In order to evaluate and measure this biodiversity and its evolutionary history, we tested the efficacy of two DNA barcoding regions, Cytochrome oxidase c subunit I (CO1) and the 16S large-subunit ribosomal DNA (ND1-16S), in determining both known and unknown species groups. Utilizing the phylogeny of a group of these spiders, in conjunction with species-delimitation and molecular dating techniques, we attempted to infer the historical biogeographic events that played a role in shaping the present-day numbers of species, their relationships, and distributions. In each analysis, every species was recovered as a strongly supported monophyletic group, suggesting there are 7 species (2 new to science), three of which represent a "cryptic species" group. Our data suggests the Pleistocene and subsequent population fragmentation due to climate change played a major role in the diversity of North American tarantulas. One species in particular, *A. hentzi*, responded to these perturbations of the Last Glacial Maximum by rapidly expanding its range and excluding all other species north of the Colorado River basin in Texas.	
Incorporating field techniques and ArcGIS to assess trends in reptile and amphibian diversity across varying levels of urbanization, Scott Jones[1], Thomas Pauley[2], [1]Department of Biology, East Carolina University, Greenville, NC, [2]Marshall University, Huntington, WV Urbanization forces many species to occupy smaller patches of habitat or new urban habitats. Some species can adapt to urban habitats, while others are excluded from them. Because of this, urbanization can play a large role in determining community composition. The goal of this study was to determine if urbanization or natural processes explained reptile and amphibian species richness at four sites in West Virginia. One site, a state park, was considered a non-urban habitat while the other three sites were considered urban habitats. This was confirmed in ArcGIS since the three urban sites fell within polygons of urbanization, showed high levels of nighttime lights, and had a high Human Footprint index, while the non-urban site was 7.62 km from the nearest polygon of urbanization, had low levels of nighttime lights, and had an intermediate Human Footprint index. Species richness ranged from 6 at one of the urban sites to 21 at the state park. Reptile and amphibian community similarity ranged from 25% between two urban sites to 57.1% between the third urban site and the state park. Tree community similarity ranged from 52.8% between two urban sites to 66.7% between one of those sites and the third urban site. Soil pH, moisture content, organic matter content, and leaf litter/organic soil combined mass were not significantly different between the sites ($P > 0.05$). Urbanization and animal species richness followed similar trends, but the environmental variables showed different trends, suggesting that urbanization may determine animal community composition at these sites.	P76

Effects of mesozooplankton grazing on phytoplankton growth in the chlorophyll maximum of the Neuse River Estuary, Benjamin McGlaughon, East Carolina University, Greenville, NC 27858 Phytoplankton biomass tends to accumulate in a distinct zone in the Neuse River Estuary (NRE) called the chlorophyll maximum (CMAX). This zone is characterized by optimal conditions for phytoplankton growth, including high nutrient concentrations, optimal light, salinity, and mixing conditions. Over 60% of the NRE phytoplankton biomass is found in the CMAX. Thus, the CMAX is a critical zone of primary production that forms the basis of the entire estuarine food web and few studies have documented the fate of phytoplankton production that occurs at localized spatial features such as CMAX. The aim of our study is to determine whether the majority of phytoplankton biomass in the CMAX is being consumed by microzooplankton or mesozooplankton. Experiments to measure mesozooplankton abundance, species composition, and grazing impacts will be conducted monthly at the NRE CMAX from March-November, allowing for a seasonal analysis of the system as the CMAX shifts position in the estuary. Zooplankton tows will be used to collect samples for taxonomic evaluation and water will be collected from two sites along the Neuse River to conduct grazing experiments, one located within the CMAX and another located upstream from the CMAX. Grazing experiments will determine clearance and ingestion rates of the mesozooplankton on the total phytoplankton community, individual phytoplankton taxonomic groups, and microzooplankton. Our grazing experiments will aid in the determination of primary pathways of phytoplankton carbon in the system.	P77
Gametogenic Development and Spawning in the Arctic Bivalve Macoma calcarea (Gmelin, 1791) in Adventfjord, Svalbard, Andrew Cathey, East Carolina University, Greenville, NC 27858 In an effort to more fully understand how climate change will influence population dynamics in Arctic ecosystems the reproductive cycle of the circumpolar bivalve *Macoma calcarea* (Gmelin, 1791) from a population located in Adventfjord, Svalbard was studied throughout a nine-month sampling period encompassing September 2007 to June 2008. Histological techniques were used to qualitatively stage gonadal tissue and to calculate oocyte relative diameter as well as the number of oocytes/follicle. Sediment photosynthetic pigments were analyzed using Reverse-Phase High Performance Liquid Chromatography for samples collected from November 2007 to June 2008 to investigate relationships between potential benthic food resources and reproductive periodicity. Oogonia were present by September with mature and spawning stage individuals observed by March. Mean oocyte relative diameter increased with the number of oocytes/follicle and peaked during June at 94.4¼m ± 10.08¼m. The number of oocytes/follicle peaked during April at 9.36 ± 1.6 during the middle of the spawning period. Individuals present in both the early stages of gametogenesis and the mature stage during June suggest that spawning events may likely continue through the summer months. Of four photopigments investigated fucoxanthin, chlorophyll a, and Chlorophyll b exhibited significant differences between months (ANOVA, $p < 0.05$). Fucoxanthin was the dominant photopigment present on most sampling dates indicating that diatoms were the	P78

most frequent algae encountered in sediments. During February significant increases in fucoxanthin concentration coincided with the first appearance of late active stage females and significant increases in both oocyte relative diameter and oocytes/follicle. Furthermore, mature and spawning stage individuals were first observed during March. Collectively, these data suggest that food availability may act as an environmental cue to stimulate rapid gonadal maturation and spawning events. The presence of oocyte diameters consistent with those reported by other authors suggests that food availability was sufficient to promote normal oocyte development in *M. calcarea.*	
***Packera tomentosa* (Asteraceae) Seed Mass Characteristics And Implications For Germination Behavior**, Lindsay Leverett, Chelsea Barbour, Courtney Koch, Jason Paxton, Claudia Jolls, East Carolina University, Greenville, NC 27858 Seed mass can influence germination behavior and seedling success. Plants with highly variable seed mass "hedge their bets" by producing seeds with dissimilar dispersal and germination behavior, which can increase progeny success in unpredictable environments. Seed heteromorphism, the production of two or more seed types with distinct forms and/or behavior, is an extreme form of mass variation. In the Asteraceae, seed heteromorphism or heterocarpy occurs between "central" and "peripheral" achenes produced by disc and ray florets, respectively. We examine seed mass characteristics and germination behavior in an eastern North Carolina population of *Packera tomentosa*, a native perennial of the Asteraceae distributed primarily within the eastern and southern Coastal Plain. Given the presence of heterocarpy in the close relative *Senecio jacobaea*, we also investigate whether P. tomentosa exhibits heterocarpy. To date, our analyses of P. tomentosa indicate that average seed mass is comparable to that of congeners (0.2746 mg ± 0.003 SE, N=872). Within-population seed mass variation is high (CV=34%), as reported in other species. Germination in a controlled environment can be high (72%, N=36) for large P. tomentosa achenes (> 0.3000 mg), suggesting that seed mass may influence germination behavior. Preliminary data show a statistically significant difference in P. tomentosa central and peripheral achene mass. Central achenes are approximately 20% heavier than peripheral achenes, a trend contrary to that typically reported for heterocarpic Asteraceae. We suggest the larger central achenes of *P. tomentosa* may be better competitors and have faster growth rates than the smaller peripheral achenes, as documented for other heterocarpic taxa. Additional investigations of germination behavior based on mass and seed type are currently in progress.	P79

Integrating the Coordinated School Health Program(CSHP) into School Health and School Based Mental Health Interventions to Prevent Suspension, Academic Failure, and Dropout in Ayden School Community, Richelle Smallwood, Danielle Harmon, East Carolina University, Greenville, NC 27858 In 2005, the CDC proclaimed that dropout prevention was a national health concern because education can determine how successful one is in life and the quality of life that one may have. While many families and youth may not consider education a priority, poor health and mental health behaviors may contribute to deficits in education. This study focused on integrating the Coordinated School Health Program (CSHP) into school health and school-based mental health interventions as mandated by North Carolina Department of Instruction. Specifically, the purpose of thisstudy was to identify the self-reported health and mental health behaviors of a small sample of students (N=5) who attended both Ayden Middle School and the Straightway After-school Program and implement interventions using the CSHP model. Participants were chosen based on referrals from community partners who interacted with the students and deemed them to have potential despite poor academic achievement, negative behavior, and factors that contributed to their risk of academic and personal failure. The mixed method design utilized genograms and ecomaps to enhance understanding of data from the Youth Risk Behavior Survey, Psycho-Socials, Fitness Gram, Grades, and Attendance. Based on the literature, researchers would expect that students may be at-risk for specific health, and mental health issues, low academic achievement; therefore in need of intensive school intervention inorder to improve their potential for quality of life and success.	P80
Practice Change: Implementation of SBIRT Substance Abuse Protocol in Primary Care, William Atherton, Marina Stanton, Paul Toriello, East Carolina University, Greenville, NC 27858 Substance abuse is largely under-diagnosed and under-treated in primary care settings. With our nation s primary care system becoming the de facto mental health care system, medical providers need help treating their patient s substance use and abuse issues. Evidence-based treatment protocols like the Screening, Brief Intervention, and Referral to Treatment (SBIRT) model, are useful mechanisms for helping providers address these issues without succumbing to the myriad of barriers inherent in taking time to assess, diagnose, treat substance abuse issues, as well as, refer for substance abuse treatment. Research has shown that the SBIRT protocol in the primary care setting is an effective method for identifying and treating patients with substance use disorders. The stigma of treatment can frequently prevent those suffering from substance use disorders from seeking treatment within traditional substance abuse facilities. SBIRT has been used effectively with a wide range of populations to address issues including: (a) smoking, (b) alcohol and/or illicit drug use and abuse, and (c) prescription drug use and abuse. Early detection of substance use and abuse issues can lead to successful treatment, and may prevent progression of both mental health and medical concerns.	P81

This poster presents information collected from a series of focus groups conducted with an academic family medical primary care center and with providers from four eastern North Carolina Community Health Care Clinics. Frequency statistics were generated from practice change data collected as part of a two year long grant funded by the North Carolina Foundation for Advanced Health Programs. Recommendations on how counseling professionals can assist are presented at the conclusion of this poster.	
Medical Family Therapy in a Primary Care Setting: A Model of Integration, Daniel Marlowe, East Carolina University, Greenville, NC 27858 In the following study, the authors present a framework for integrating primary care services with medical family therapists (MedFTs) as the behavioral health providers (BHPs) within the medical system. The framework, which was obtained through using ethnography of communication, describes the BHP's interactions with both patients and medical providers from initial patient contact through coordination of the treatment plan. Three different global patient conditions were identified as helping to provide the initial context for the encounter; (a) new patient, (b) return visit-worsening or no change in condition, and (c) return visit- improving condition. Next, five phases were identified that comprised the BHP's overall interactional process with the patient and medical provider; (a) patient briefing, (b) introduction, (c) elicitation of the illness story, (d) intervention, and (e) relaying information. Rules governing both solo (BHP only) and conjoint (BHP and medical provider) sessions are described, as well as how these phases and rules change based on whom is present in the exam room. Finally, future research generating a description of the entire care model, as well as the need for efficacy and effectiveness studies regarding similar systems of care are discussed.	P82
Reducing Liability: an assessment of agritourism practices, Shannon Arnold, East Carolina University, Greenville, NC 27858 Agritourism refers to the act of going to a region, or in this case, the state of North Carolina to visit a working farm or farm-related business-including restaurants, markets, produce outlets and natural attractions-for enjoyment, education, or active participation in activities and events (Eker, Clark, Cartwright, Kancans, Please & Binks 2010). As the popularity of agritourism grows across the state of North Carolina, owners and operators have expressed concern about liability for personal injuries of participants as well as meritless lawsuits. To render these concerns, providers of agritourism activities have presented legislators with ideas for an agritourism statute to limit liability for injuries resulting from inherent risks (Centner 2010). This study attempts to better understand the actions agritourism businesses in North Carolina are taking to improve guest safety and reduce their risk of being held liable when accidents occur. A pilot study was conducted in spring 2010 of agritourism	P83

business owner and/or operators in Eastern North Carolina. An electronic survey was emailed to the predetermined businesses with directions on how to complete and submit the answers electronically. The results of the pilot test were analyzed and questions were refined in order to distribute the survey across the state. The North Carolina Agritourism Networking Association distributed the survey electronically to all 272 members across the state. Additional data was collected at conferences focusing on agritourism throughout the state. Data collected from these surveys was calculated and analyzed using Excel and SPSS 17.0.2 for distribution to all interested participants.	
Social Networks in Rural Tourism Destinations, Jerry Tsao, Paige Schneider, Carol Kline, East Carolina University, Greenville, NC 27858 Within the last two decades, tourism development has been utilized as an economic development strategy in rural areas. Business development opportunities through tourism include the lodging, dining, retail, transportation, guiding and outfitting, and arts sectors of the economy. Social networks are the linkages between various stakeholders of the tourism industry sectors that enable small organizations and businesses to collaborate and leverage their individual resources towards a larger shared goal of regional economic development. These networks can produce benefits to both the community and the visitors. For the community, social networks foster collective action, encourage knowledge-sharing, further pooling of resources, and reduce economic leakage to facilitate increased entrepreneurial activity. For the visitors, strong social networks within the destination community can enhance the quality of tourism experiences. This study examines the social networks among tourism businesses and organizations in eastern North Carolina to determine the number, strength, diversity and nature of social networks held and the benefits derived from them. Adapting previous social network research, a survey instrument was developed and administered to tourism industry-related businesses and organizations spanning eleven municipalities in the Roanoke River Valley Region (RRVR). This survey was part of a larger effort to increase tourism in this rural region of the state through establishing a collaborative effort of the mayors of the eleven towns. Businesses/organizations included in the study were varied: lodging and restaurant venues, services and attractions such as river guides and outfitters, theaters, art galleries, craft shops, local, regional, and state park and recreation organizations, festival coordinators, wineries, and DMOs such as local conference and visitors bureaus and chambers of commerce. The list included both chain establishments and small, locally owned establishments. A pilot study of the survey instrument was conducted with the mayors and modifications made based on feedback. A modified Dillman (1978) technique will be used for the survey distribution. The study will build understanding of social networks among tourism businesses and organizations in eastern North Carolina.	P84

Planning for Hurricanes in Coastal North Carolina: A Typology of Organizational Decision Making, Michelle Covi, Donna Kain, East Carolina University, Greenville, NC 27858 Hurricanes are high consequence, low probability events for which planning is key to emergency management. Emergency communication and planning are critical for businesses and organizations of all sizes. Planning before a disaster is also a good indicator of whether a business will be able to stay in business after a disaster. This study employs measures of affiliation and uses of information sources, the association between these two factors and the use of a written emergency response plan as indicators of emergency preparedness. A typology was developed to identify organizations that might be at greater risk during a hurricane emergency. Collaborative and cooperative organizations, which scored higher on affiliation, were 26% and 28% more likely, respectively, than Independent organizations to have formal, written emergency plans. Isolated organizations, those with the lowest score for both affiliation and information, were less likely to have a formal written plan than any other type of organization.	P85
An Osteobiographical Analysis of the Foscue Plantation Burial Vault, Pollocksville, Jones County, North Carolina, Melinda Seeman, Department of Anthropology, East Carolina University, Greenville, NC 27858 In 2010, an early 19th century crypt was excavated on Foscue Plantation in eastern North Carolina as part of a National Historic site salvage project. According to historical records, three individuals purportedly were interred in the crypt; Simon Foscue, Sr, Simon Foscue, Jr, and his wife Christiana "Kitty" Rhem Foscue. The lack of research on "elite" 19th century rural populations in eastern North Carolina meant that remains recovered from the crypt could provide valuable information on their life histories beyond historical documents, including health, diet, disease, and burial practices. Excavation of the crypt in fact revealed nine individuals: 1 adult male and 4 adult females, a 3 year (± 12 months) old child, and three preterm fetuses, two of which were likely twins. The estimated age of the fetuses suggests that one of the females interred may have died eight months pregnant. The absence of some individuals in the crypt from the historical records could have been the result of later internment in the crypt during a period of poor record-keeping. Initial paleopathology analysis indicates that the childhood and adult health of these individuals is notably better when compared to free landowning individuals in other areas of the Southeastern U.S. These detailed osteobiographies presented in this study, along with the historical documents, provide a renewed picture of a cross-section of a rural plantation-owning family in 18th and 19th century eastern North Carolina.	P86

A Systematic Review of Interventions for Military Couples , Melissa Lewis, Angela Lamson, East Carolina University, Greenville, NC 27858 Military members and their spouses experience unique stressors compared to civilian couples making them vulnerable to a number of mental and physical health concerns. This research study collected data on the efficacy of current couple-based interventions for military members and their spouses. A literature synthesis was completed by evaluating over 3,400 scholarly articles. Articles that were included were those that were indexed and peer reviewed, included participants that were active duty, reserve or veteran members of the military, and had an intervention that targeted couples. Articles were excluded from the review if participants were seriously mentally ill, did not use an experimental or quasi-experimental design, did not have a measure of relationship dynamics and did not measure the effectiveness of the treatment intervention. In total, nine articles met the study s inclusion and exclusion criteria; however only two of the articles used a true experimental design. A majority of the articles used a survey instrument completed by both members of the dyad to gather couple data, while one used couple interviews. Although research was limited in number and by methodology, systems theory-based interventions were related to positive outcomes for the couples, Cognitive Behavioral Therapy interventions produced mixed results as did skills-based programs. Pre-marital counseling and interventions targeting domestic violence did not produce consistent, significant results. Limitations to this synthesis include the inaccessibility to research articles that the military has not released to the public and lack of studies that use randomized controlled groups. While this literature synthesis may guide clinicians and researchers who work with military and veteran couples, additional studies regarding couple-focused intervention, data collection, and analysis are needed to determine the efficacy of couple s interventions in the military population. Particularly, experimental methodology, a broader variety of couple s interventions, as well as survey and assessment tools are recommended to explore which interventions and assessment tools are most sensitive in gathering accurate data for military couples.	P87
Becoming Hmong-American for a Day: Immersion into Hmong Culture, Jacqueline Coleman-Carmon, East Carolina University, Greenville, NC 27858 Research assistants conducted qualitative interviews with students, faculty, and participants to explore authentic processes used to apply, integrate, teach, learn, and examine community partnerships as key components to engaged research. The interviewers were interested in how students, faculty, and participants (family members) viewed the processes of learning about Hmong culture as well as their own and how this might influence future cross-cultural practice. Students reported that they learned as much about their own culture as Hmong culture. They also indicated how much respect they had for the families who made it to the US. They appreciated being allowed to ask questions of Hmong focus group participants to determine how close the literature was to the reality of the Hmong experiences. ECU Faculty members were immersed into the Hmong culture by	P88

attending the New Year Celebration in traditional costumes. They reported that their teaching and outlooks on engaged scholarship had been transformed in positive ways. Hmong participants were happy to share their culture, answer questions, and teach others about Hmong people. This paper would be ideal for a panel discussion with each panel member giving a brief overview then responding to questions. The panel would consist of research assistants, social work students studying Hmong culture as a part of a cultural diversity class and a social work skills class, faculty members in social work (Engagement and Outreach Academy Scholar), health education (coaching in the Hmong community), and mentor for scholar, Hmong community participants.	
College Students Financial Attitudes and Behaviors: Multiple Influences, Kristen Kaverman, Taylor DeMagistris, Tiffany Powell, East Carolina University, Greenville, NC 27858 The financial habits that form during young adulthood are likely to persist throughout adulthood and are likely to have a profound influence on one's financial and personal life (Shim et al., 2010). Unfortunately, college students are significantly ill-prepared to manage their finances properly (Lyons, 2004). Many studies have shown that students who are in debt tend to lack not only financial knowledge (Norvilitis et al., 2006), but self-esteem, self-control, and experience feelings of isolation, depression, anxiety, and stress (Mowen & Spears, 1999). Researchers have found that many young adults learn financial literacy from their parents (Jorgensen & Savla, 2010), financial education classes and programs (Peng et al., 2007), and through the work place (Borden et al., 2007). One study found that young adults with strongly held favorable attitudes toward financial management were more likely to engage in positive financial behaviors (Shim et al., 2009). There is a lack of research that explores the relationship between financial attitudes and behaviors of college students apart from credit card use and credit card debt (i.e., Shim et al., 2009). In addition, little research has been done on the influence that work experience has on an individual s financial literacy. The purposes of the current study are: 1) to examine the influence of financial education and work experience on college students financial attitudes and behaviors, 2) to examine whether those who state that purchasing things is important to one s own happiness differ in their financial behaviors of budgeting, tracking expenses, and saving, and 3) to explore the relationship between financial attitudes, financial behaviors, and total amount of debt. This study combined social learning theory and family resource management theory in a way that considers environmental influences in regards to their financial knowledge, attitudes, and behaviors. Participants in the study were undergraduate students recruited across six states (N=462). The College Student Financial Literacy Survey measures financial knowledge, financial attitudes, financial behaviors, influences (e.g., parental and educator), and personal characteristics that affect financial literacy. The researchers are currently analyzing the data and writing the findings which will be included in the presentation at the research forum.	P89

An in situ exploration in jellyfish-hypoxia research, Mahealani Kaneshiro-Pineiro, Benjamin McGlaughon, East Carolina University, Greenville, NC 27858 Current literature suggests that jellyfish benefit from hypoxia (low dissolved oxygen bottom water, < 2 mg L-1) as opposed to fish. Persistent hypoxia may favor the survival and reproduction of jellyfish, leading to enhanced abundance. To evaluate the relationship between hypoxia and jellyfish, a pilot study was conducted in the Pamlico River (Summer 2010). Two jellyfish species (comb jellyfish *Mnemiopsis leidyi* and sea nettle *Chrysaora quinquecirrha*) and water chemistry data were collected along a transect line of five field sites extending from Pamlico River to Pamlico Sound. The primary objectives of this study were 1) to determine the abundance of both species in the Pamlico River and to determine if abundance was associated with hypoxic water; 2) to determine if histological methods could be used to identify the gonal tissue of *C. quinquecirrha*. Hypoxia was not present at any collection location. *Mnemiopsis leidyi* was the most collected jellyfish (n=42). Only two individual *C.quinquecirrha* were obtained during the sampling regime. Histology was successful in determining the sex of individual *C. quinquecirrha*.	P90
Separation of Preservatives Using Green Subcritical Water Chromatography, Brahmam Kapalavavi, East Carolina University, Greenville, NC 27858 The trend in the HPLC separation using organic solvents has changed greatly with the introduction of elevated temperature, which leads to high-temperature liquid chromatography (HTLC). The green approach of HTLC is subcritical water chromatography (SBWC), where the separation is achieved using pure high-temperature water as the mobile phase. The major advantage of subcritical water chromatography is the elimination of toxic and expensive organic solvents. In this Procter & Gamble funded project, the preservatives in Olay skincare creams have been separated and analyzed by both homemade and commercial SBWC systems at temperatures ranging from 100 to 200 °C on ZirChrom-DB, XBridge phenyl, or XBridge C18 columns. The same separation was also performed using traditional HPLC for comparison purpose. Our results demonstrate that SBWC separation is as efficient as that obtained by the traditional HPLC methods. Most importantly, the quantification results of three Olay cream samples are accurate and precise. Since the columns are relatively stable at high temperatures tested and the commercial system is reliable, the green SBWC methods developed using the commercial system can be applied in industrial plants.	P91
Kinetic modeling of the reaction and crystallization of acetylsalicylic acid using ATR UV-vis spectroscopy, David Joiner[1], Julien Billeter[1], Mary Ellen P. McNally[2], Ron M. Hoffman[2], Paul J. Gemperline[1] [1]Department of Chemistry, East Carolina University, Greenville, NC 27858 [2]E.I. DuPont de Nemours and Co., Inc., Crop Protection Products and Engineering Technologies,	P92

Stine Haskell Research Center, Newark, DE 19711 In industry, spectroscopy is used to monitor batch chemical reactions and to maximize production of a material for a minimum cost. However, there are many challenges involved in using spectroscopic methods to characterize reaction systems that undergo crystallization. For instance, the crystallization of a product in solution creates a slurry mixture for which it is hard to measure light absorption due to the nature of the mixture. Some of these problems are less prominent when using attenuated total reflectance (ATR) techniques (provided the enhancement of solid particles is low), due to its ability to circumvent the problems of separating light absorption from light scattering encountered in diffuse reflectance measurements [1]. The aim of this work is to formulate a kinetic model [2] for the reaction of salicylic acid with acetic anhydride that leads to the formation of acetylsalicylic acid and to its subsequent crystallization.The experiment involves a solid addition of salicylic acid into acetic anhydride, followed by an addition of water to consume the excess reactant, and finally a cooling step to initiate nucleation and crystal growth. The kinetic model will be constructed based on changes in light absorption measured by attenuated total reflectance ultraviolet-visible (ATR UV-vis) spectroscopy. In addition, near infrared (NIR) diffuse reflectance spectroscopy will be used to determine the onset of nucleation and the degree of supersaturation which is the driving force for a power law based model describing the crystallization of the product. **References** [1] Falconet et al, Applied Optics 47 (2008) 1734-1739 [2] Gemperline P., Practical Guide to Chemometrics, 2nd Edition (2006), Boca Raton, Taylor & Francis	
Spatial And Temporal Variability Of Surface Shelf Sediments On The Waipaoa River Margin, New Zealand, Joseph Kiker, J.P. Walsh, D. Reide Corbett The Waipaoa River Margin, located off the northeast coast of the North Island of New Zealand, affords the opportunity to assess the fidelity of the stratigraphic record and sediment dynamics in a coastal setting characterized by a narrow shelf (~20 km) and ample sediment supply (15 Mt y-1). Sediments are delivered to this margin via the Waipaoa River which drains a small mountainous catchment (2205 km2) comprised of highly erodible lithologies. As part of an NSF-funded project, time-series analysis of surface seabed properties is being used as a foundation to evaluate spatial and temporal changes in strata formation and sediment dynamics on the adjacent margin. Samples were collected on three cruises taking place in 2010 (January, May, and September) with a fourth scheduled for mid-February 2011. Preliminary results show that both erodibility measurements of the seabed and radioisotope inventories vary in a complex manner through space and time. Erodibility measurements (n=14) of mid-shelf depocenter muds, determined using a Gust microcosm, had a mean value (AVG) of 0.42 kg m-2, with a standard deviation (Ã) of 0.10 in comparison to measurements (n=12) made at	P93

coarser-grained sites on the margin (AVG = 1.44 kg m-2, Ã = 0.94), indicating depocenter muds are less erodible. Variations in physical seabed properties (e.g., grain size, total organic carbon, porosity) and amount of biological influence (e.g., bioturbation, biofilms) are likely responsible for the complexity of erodibility variations across the margin. The distribution of short-lived radionuclides, specifically 7Be, is also spatially and temporally complex. 7Be inventories suggest that short-term deposition does not necessarily mimic long-term sediment accumulation. Mid-shelf sediment depocenter data from January and September 2010 are characterized by high 7Be inventories in comparison to other areas of the margin which is consistent with previous research. Conversely, sediments collected in May 2010 from "Poverty Gap", a suspected sediment bypass region on the shelf, are characterized by high 7Be inventories, suggesting ephemeral deposition. The complete annual dataset combined with in situ sediment-transport measurements and modeling efforts of collaborators will give valuable insight into sedimentation in this complex system.	
Is predation by turtles sufficiently strong to affect invertebrate biodiversity? Charles Williams, David Chalcraft, East Carolina University, Greenville, NC 27858 Ecologists have long known that predation can have a strong effect on the diversity and abundance of prey present in ecological communities. Much evidence on the importance of predators in aquatic systems has stemmed from studies where individuals manipulate the abundance or occurrence of particular predator species or groups of predator species that are thought to play an important role. In freshwater aquatic systems, fish are often thought of as the most important predator in permanent ponds while salamanders and insects are often thought of as the most important predator in ephemeral ponds that dry. Turtles represent a taxonomic group of predators that is completely overlooked in studies assessing the importance of predation. This is surprising as turtles can consume a wide array of prey species and can be locally abundant. We conducted an exclosure experiment in an ephemeral pond that lacks fish to examine whether turtles play an important role in controlling the distribution and abundance of amphibian and invertebrate prey within the pond. The ability of turtles to graze in some plots but not others did not alter the number of prey species present within study plots or the evenness of prey species present within study plots. A comparison of species accumulation curves reveals, however, that turtles tended to reduce the total number of prey species found across all study plots where they had the ability to graze in contrast to that observed across all of the areas where they did not have access. PERMDISP results suggest that scale dependent differences in the effect of turtles on species richness are the result of turtles homogenizing the kinds of prey species that are present in areas where they could graze. Our results also suggest that turtles reduced the abundance of large invertebrates, especially dragonflies. The abundance of insects in areas that turtles had access to was approximately 75% of that observed in areas where turtles did not have access. Our results demonstrate that turtles can have an important affect on the abundance of invertebrates present in ponds and can cause a reduction in the total diversity of insects present in a pond by homogenizing species composition of different localities.	P94

Illuminating 2D porosity and pore geometry in moldic limestones: An example from the Upper Castle Hayne Aquifer, North Carolina, Alexander Culpepper, Alex Manda, Department of Geological Sciences, East Carolina University, Greenville, NC 27858 Limestone aquifers are vital sources of groundwater for domestic and industrial use throughout the world. To sustain rising population throughout the southeastern United States, aquifers are increasingly exploited to provide the populace reliable and clean water resources. One example of such aquifer is the Eocene Castle Hayne Formation, a moldic limestone, which is part of the Castle Hayne Aquifer System (CHAS) located in eastern North Carolina. Spanning nearly 12,500 square miles the CHAS is the most productive aquifer system in the North Carolina Coastal Plain. The relatively high porosity associated with this moldic limestone means that the aquifer is highly susceptible to contamination. In order to better manage groundwater resources and evaluate the potential for contaminant transport, detailed investigation of the complex hydrogeology of moldic limestones must be undertaken. In the past, digital classification systems had been difficult in quantifying 2D porosity, but advances in computer processing abilities and simplification of software programs now make digital porosity classification much more appealing for analyzing hydrogeologic properties. This study uses high resolution digital images of core samples collected from the CHAS and geospatial analysis techniques to quantitatively characterize the geometry, distribution, and scaling properties of macropores in the CHAS. With more accurate analysis of how spatial distribution of pores and pore geometry affect porosity, a greater understanding of how groundwater moves in moldic aquifers can be gained, and thus modeling and interpretation of ground water flow will only become more powerful and precise.	P95
Diversity and group specific degeneration of the RNA polymerase II C-terminal Domain, Chunlin Yang, East Carolina University, Greenville, NC 27858 The C-terminal domain (CTD) of the largest subunit (RPB1) of DNA-dependent RNA polymerase II, composed of tandemly repeated consensus Y-S-P-T-S-P-S heptapeptides, is highly conserved in most of eukaryotes. Previous research indicated that the CTDs of several species appear to have experienced degeneration from a tandemly repeated ancestral condition. The evolutionary mechanisms responsible for conservation or degeneration of the CTDs are still unknown; hence, we have undertaken an investigation of the evolution and diversity of CTDs from the six eukaryotic supergroups. In this study, CTDs were analyzed from more than one hundred species. Our results show that the CTD has undergone degeneration within many lineages of the Fungi group, mainly in the Basidiomycota and Pezizomycotina, whereas the CTDs s tandem structure tends to be more strongly conserved in unicellular yeasts. Intriguingly, degeneration of the CTD also occurred during the transition from unicellular life to multicellular life in red aglae. In contrast, the consensus structure of the CTD is strongly conserved within other multicellular eukaryotic lineages, including	P96

plants and animals. Finally, the CTDs of various protist groups, most notably the Apicomplexans, also have experienced rapid and variable evolution.	
Surfactant Assisted Electrospray Ionization Time of Flight Mass Spec of non-polar Synthetic Polymers coupled with chromatographic separation, Robert Raines, Christopher Williams, East Carolina University, Greenville, NC 27858 It is well known that a polymer's length, composition, and poly-dispersity govern most of that polymer's mechanical properties. Accurate analysis of these characteristics is vital to understanding the polymers in hand, and not just what is assumed from product labeling or work done in another's lab. We have been working to optimize accurate analysis of synthetic polymers through Surfactant-assisted electro-spray ionization and time-of-flight mass spectrometry. End group analysis was achieved on poly(methyl-methacrylate) and poly(styrene) while both reducing sodium charging and minimizing multiple charging. This was achieved by optimizing solvent composition to accommodate both the surfactant solvation and the reduction in sodium as a source of charging. Our results show "clean" single charging of both poly(methyl-methacrylate) and poly(styrene), including signs of backbiting in one of our poly(methyl-methacrylate) samples. Evidence for this was obtained using ESI-Tof-MS, and future work is expected to confirm that with both GPC and MS MS work. Future work will also include surfactant optimization for further analysis.	P97
From Dormancy to Dominance: How Priority Effects and Predation Influence Temporary Pond Crustacea, Lauren McCarthy, David Chalcraft, East Carolina University, Greenville, NC 27858 A growing amount of evidence indicates that both the order in which species enter into a community and the process of predation can play an important role in controlling community dynamics. Seldom considered are how colonization history and predation history interact to control community dynamics. Large branchiopods (fairy shrimp and clam shrimp) and cladocerans produce dormant eggs and exhibit diverse hatching patterns leading to differences in hatching phenology. Fairy shrimp eggs hatch quickly after a pond fills and may monopolize resources immediately causing a strong priority effect on later arriving species. Flying insect predators, particularly notonectids, increase in abundance as time after pond filling increases, and they can readily consume branchiopods and cladocerans. Thus, the impact of colonization order may be reduced in the presence of predation if predators preferentially consume branchiopods. To investigate these effects we will use artificial mesocosms, which can accurately mimic temporary pond systems and can be easily replicated. We will manipulate the sequence in which fairy shrimp, clam shrimp, and a cladoceran species immigrate into the plankton component of freshwater ponds that vary in the occurrence of predatory insects to test for priority effects. Each treatment will be replicated four times for a total of 48 mesocosms. We hypothesize the larger and more efficient filter feeding fairy	P98

shrimp will dominate plankton assemblages when they enter ponds early because they will inhibit smaller, less efficient clam shrimp and cladocerans. However, when predation occurs we expect to see a trade-off between competitive ability and predator invulnerability. The better competitors (fairy shrimp) will be negatively affected by predation and the poor competitors (clam shrimp and cladocerans) will be less vulnerable to predation, causing the plankton assemblage to be dominated by clam shrimp and cladocerans.	
Images of Race and Gender in State Travel Guides from the Carolinas: The Importance of Socially Responsible Tourism Marketing in the post-Civil Rights South, Michaelina Antahades, Derek Alderman, Department of Geography, East Carolina University, Greenville, NC 27858 Scholars and industry leaders have called for socially responsible approaches to tourism marketing that bring greater equity and diversity to imagery found in brochures and travel guides. The tourism industry has been criticized historically for representing the world through a masculine lens that maintains sexist stereotypes and constrains female identities. In addition, past research indicates that African Americans are often excluded from travel promotions. When depicted, they are often shown as servants and entertainers rather than tourists. These representational inequalities are neither ethical nor ultimately sustainable when one considers the growing market presence of minority tourists and the important role that women play in vacation travel decisions. The purpose of this project is to explore the extent and manner in which women and African Americans are represented within the state travel guides of North Carolina and South Carolina. A visual content analysis is performed on each state s 2010 official travel guide/magazine, determining the frequency and manner in which women and Africans are displayed in promotional photographs. Photographs play a powerful role in communicating meaning to tourists and framing their expectations. They participate in a "circle of representation" that not only attracts visitors to destinations but help in perpetuating certain iconic views of places and people. These iconic images transmit messages about who is most welcomed as a visitor (and, conversely, who is not) as well as the conditions under which that hospitality is extended. Using the collected data on photographs used in Carolina state travel guides, we proceed along inter-group and inter-role lines of analysis. Inter-group comparisons determine the frequency of African Americans being displayed in travel guide photographs relative to whites and the frequency of women being depicted versus men. Inter-role comparisons determine the extent to which African Americans are represented as tourists versus hosts, both in absolute terms and compared to the trend for whites. Inter-role comparisons for women focus on the extent to which they are pictured as participating in traditional gender roles versus non-traditional roles. Results of the study suggest that more critical attention should be devoted to monitoring the destination image communicated in the Carolinas.	P99

Care, Education and Developmentally Appropriate Practices as understood by Day Nursery and Kindergarten Japanese Teachers, Chisato Sugita, Archana Hegde, East Carolina University, Greenville, NC 27858 There has been a huge push towards integrating the care and education system of Japan, which is still being governed by two different ministries and has different teacher training requirements. Recent changes require that children from both the settings be exposed to the same curricula and activities which predominantly use a play-based philosophy for educating children. Play-based philosophy which is originally a western concept, also known as Developmentally Appropriate Practices (DAP) is played differently in Japan, which has elements of culture embedded within them. Thus, the purpose of this study was two folds; 1) To examine how day nursery and kindergarten teachers view play-based education (DAP) in Japan 2) To look for similarities and differences between teachers understanding of care, education and DAP. A mixed method study using surveys and interviews were employed to gather data. The survey designed, directly asked teachers concepts related to DAP (e.g. their understanding of use of group vs individual activities or use of formal assessments in the classroom), while the interviews used open ended questions which indirectly tapped into teachers beliefs regarding care, education and DAP. A total of 10 teachers, 6 from day nursery and 4 from kindergartens were interviewed. Survey data analyzed using descriptive statistics showed overwhelming similarities between teachers understanding of play based education, while open ended interviews revealed a few similarities and differences across the concept of care, education and DAP. For example, being a good role model for children, importance of outdoor environments, developing children's socio-emotional skills and teaching children to be a part of the greater community was given due importance by teachers across both the settings. All the themes were identified using constant comparative analysis developed by Glasser and Strauss. To conclude, this study gives insight into the Japanese early childhood care and education system from teacher's perspective which has been missing in the literature. Further, it also highlights how a few issues identified by Japanese teachers, such as fear of push down curriculum or need for more resources is not limited to just Japan but is a global issue for the field.	P100
An Analysis of global trends in homicide (2003-2008): Do we live in a violent world? Brittany Ausley, Rachel Frazier, East Carolina University, Greenville, NC 27858 Homicide is a global phenomenon, yet there are only few studies that have examined worldwide regional variations in homicide rates. Moreover, most criminal justice homicide research is based on micro-level data analysis which focuses on individual characteristics (for example, age, race, gender, motive, offending, and victimization). Few studies have examined the influence of macro-level factors on homicide rate (for example, the role of state authority, country wealth, and governance). This study seeks to build on the extant research on homicide by analyzing the factors that influence current worldwide homicide trends (2003-2008). The objectives of this study are two-	P101

fold. First, using the latest homicide data from various sources, we identify regions in the world with the highest and lowest homicide rates. Second, we investigate the macro-level factors that account for global variations in homicide rates in different countries. The findings of this study indicate that the Caribbean and Latin American countries are the most lethal regions in the world while Asian and European nations are the least lethal regions. The findings further reveal several principal factors that account for regional and country-level variations in homicide rates: weak state authority, narco-trafficking, social inequality, alcohol consumption, and country wealth. The limitations and policy implications of this study will be presented.	
Reinterpreting cribra orbitalia etiology in a coastal North Carolina Algonkian population using CT scans, Crystal Vasalech, East Carolina University, Greenville, NC 27858 Cribra orbitalia is visually characterized by porous lesions on the orbital roof and is often attributed to iron deficiency anemia, although other etiologies are possible. The main objective of this study is to reassess the diagnosis of iron-deficiency related cribra orbitalia in a North Carolina coastal Algonkian population (n= 50, AD 295-1460) using non-destructive methods. Microscopic techniques such as thin-ground sectioning have successfully differentiated between diploic expansion attributed to anemia as opposed to other etiologies. Such destructive techniques often are not possible with some U.S. samples because of NAGPRA provisions. Thus, we utilize non-invasive computed tomography (CT) scanning as a viable alternative to identify diploic expansion versus other sources of porosity in the orbital roof. Forty-five crania with varied forms of upper orbital lesions and 5 crania without lesions were selected for this analysis. The axial anterior-posterior CT images allow distinction between diploic expansion and resorption of the corresponding cortical bone and cortical bone porosity. This preliminary study therefore suggests that CT scanning is a viable replacement for histological assessment of pathologies in cases where destructive analyses are prohibited. By more accurately understanding the etiology of cribra orbitalia in archaeological populations, we can better understand their dietary habits, health, quality of life, and overall adaptations to their unique environment. Reconsidering the etiology of cribra orbitalia has important implications for the current interpretations of malnutrition and infectious disease in earlier human populations. This new non-destructive methodology has implications for paleopathological methodology, archaeology, and Native American history.	P102
Sustainable Food System of Eastern North Carolina, Garrett Ziegler, East Carolina University, Greenville, NC 27858 Food and beverage is an important part of any tourism destination, offering visitors an opportunity to learn about regional cuisine, artisan preparation, and the growth/production of their food. The social movement of local and sustainable food production has created a unique culinary culture in Eastern NC. This project looked at the sustainable food system of Eastern North Carolina and how	P103

it relates to the tourism of the area. Information regarding sustainability and food-systems was analyzed both on a global and a regional scale. The key role that a sustainable food system plays within a tourism destination was identified. This information was synthesized to create several sustainable initiatives that can help spur sustainable economic development within North Carolina. These initiatives have the ability to play an important role in fostering community prosperity among the rural areas of Eastern North Carolina.	
Analyzing Resident Place Satisfaction in a Tourist Destination through Auto-Photography: The Case of Southern Shores, North Carolina, Allison Hueber, Derek Alderman, Department of Geography, East Carolina University, Greenville, NC 27858 Resident satisfaction in tourist destinations lies at the heart of the movement toward more socially sustainable development. Addressing the place-based views and concerns of residents is necessary for maintaining public support for tourism. This project analyzed place satisfaction among full-time residents living in Southern Shores, North Carolina. The qualitative methods of auto-photography and photo-elicitation interview were used with twelve residents of varying lengths of residence in the Outer Banks community. Participants were supplied with disposable cameras and asked to photograph what they like and dislike about Southern Shores. In reacting to their photographs, participants communicated views, feelings, and a sense of place that allowed researchers to identify positive and negative aspects of tourism development. For some participating residents, the very act of photographing Southern Shores and choosing what to represent visually made them more cognizant of place satisfaction, thus pointing to the method s potential as a public education and Extension tool.	P104
Stop The Hovering: Helicopter Mentor, A New View On The Dysfunctional Mentor, Catherine Buria, East Carolina University, Greenville, NC 27858 Much research has been conducted on the effects of positive mentoring relationships; a new stream of research has begun on the dysfunctional mentoring relationships and their outcomes. The current study is filling in the gaps of dysfunctional mentoring research, focusing on the protégés' perspective on mentoring behaviors. In the current study, I created the concept of a helicopter mentor through review of the parenting literature on helicopter/ overprotective parents. Through the review of this literature, a definition for the helicopter mentor was constructed. It is proposed that helicopter mentors are 1) highly supervising, 2) show difficulties allowing the protégés to have relationships with others, 3) discourage independent work, and 4) are highly controlling. There are no current measures evaluating a helicopter mentor. The current study is validating a new measure for the helicopter mentor. To ensure that the new measure shows internal reliability and a four-factor structure, a confirmatory factor analysis will be run. To build a nomological net to establish concurrent and discriminate validity evidence, related mentoring measures will be compared to the	P105

new helicopter mentor measure. A measure of a positive mentor will be used to review the concurrent validity, while a measure of general dysfunctionality in a mentor is used for discriminate validity. The parent literature was reviewed for the outcomes on a child with a helicopter parent. High anxiety and low self-esteem were found in the parent literature to be outcomes of a helicopter parent relationship. To further confirm the helicopter mentor measure, anxiety and self-esteem measures were added. Data were collected from approximately 500 participants; the participants are both students and non-students above the age of 18. The participants were recruited via ECU's Experimentrak, as well as individual networking. It is hypothesized that the helicopter mentoring measure will be negatively related to the typical mentor measure, and will be moderately related to the general dysfunctionality measure. In addition, protégés with helicopter mentors will experience higher degrees of anxiety and will hold lower levels of self-esteem than those who have typical mentors and those with dysfunctional mentors. The data collection part of this project is almost complete. Analyses will be completed by mid-March.	
The Effects of Presentation Rate on Semantic, Syntactic, and Orthographic Processing on Reading Fluency in Children, Donna Wolfe, East Carolina University, Greenville, NC 27858 Reading fluency is the bridge between reading decoding and reading comprehension. A child becomes fluent between second and third grade (Coltheart, 1978). However, it is unknown if fluency is strictly the result of rapid decoding or underlying language skills. It also is unknown how recognition of orthographic word forms, decoding rate, and accuracy independently contribute to the development of reading fluency. Studies have shown that semantic and syntactic abilities of oral language are related to later reading decoding and comprehension skills. While relationships between these oral language abilities and later reading skills have been recognized to some degree, studies are inconclusive regarding the relationship to reading fluency. The purpose of the present investigation was to determine if semantic, syntactic, and orthographic processing abilities as measured by reaction time and accuracy are differentially affected as a function of stimulus modality (reading and auditory) and stimulus presentation rate. Participants included 50 second and third grade children (7 to 10 years of age) with varying reading and language skills based on a series of pre-experimental tasks. Participants completed a series of semantic, syntactic, and orthographic processing tasks within two controlled stimulus presentation durations for auditory and visual modalities. Relationships to pre-experimental reading and oral language tasks were explored. For the reading tasks, results revealed a strong correlation for the shorter stimulus duration between the accuracy of the orthographic processing task and reading fluency. The longer stimulus presentation duration for the semantic processing task resulted in a strong correlation between semantic processing accuracy and overall reading fluency. In addition, the shorter stimulus presentation duration for the syntactic processing task resulted in a strong correlation between syntactic processing accuracy and overall reading efficiency. For the auditory linguistic tasks, results revealed a strong correlation for the shorter stimulus duration between the accuracy of the	P106

orthographic processing task and reading fluency. Results reveal a strong association between oral language skills and reading fluency. Rate of processing and stimulus duration may be factors in the overall assessment of efficient reading decoding.	
College students and credit card debt: the role of parental interactions, work experience, and financial education. Adam Hancock, Bryce Jorgensen, Meagan Rhodes, East Carolina University, Greenville, NC 27858 Due to financial concerns, 60 percent of baccalaureate students are not finishing within 6 years and over half never complete their degree (Roberts, Golding, Towell, Weinreb, 1999; U.S. Dept. of Education, 2007). More students are dropping out of school not because of academic failure, but because of increasing credit card debt (CCD) (Gallo, 2006; Parks-Yancy, et al., 2007). With 84% of students having a minimum of one credit card, and half of the students have four or more cards with an average total CCD > $3170 (Sallie Mae, 2009), there is a growing concern across the nation. Utilizing social learning theory and family resource management theory, our study actually helps fill in some important gaps in the well studied area of college students and CCD. Although there are studies showing the important role of parents on CCD (Hayhoe, et al., 2005; Jorgensen & Savla, 2010), none have been able to capture how the frequencies and types of parental interactions influence the number of credit cards and the amount of CCD held by college students. Another important area that has been addressed in previous research is how the number of hours worked per week influence credit card debt (Nellie Mae, 2004; Novilitis & MacLean, 2010); however, we are possibly the first study to address years of work experience among college students and its relationship to CCD and number of cards held. In addition, we analyze how years of work experience relate to credit card knowledge and attitudes. Finally, when students are knowledgeable about CCD researchers are worried that they do not have the right knowledge (Braunsberger, et al., 2005), in our study we run statistical measures that reveal the relationships that exists between CCD, current financial knowledge, previous financial education, and future attitudes toward learning more about credit cards. For this study, the College Student Financial Literacy Survey (CSFLS) was created to measure multiple financial areas from 44 content questions with a total of 82 items: knowledge, attitudes, behavior, influences (e.g., parental and educator), and other personal characteristics that affect financial literacy. There was a 43% response rate (N=462) across seven college campuses in six different states. Preliminary findings have promising implications for researchers, educators, and counselors.	P107

Lost in Mayberry: The Impact of the Andy Griffith Show on Sense of Place in Mount Airy, North Carolina, Stefanie Benjamin, Derek Alderman, East Carolina University, Greenville, NC 27858 Realizing community prosperity from tourism requires understanding how tourists and locals perceive, experience, and identify with place in multiple and sometimes contradictory ways. Mount Airy, North Carolina actively markets itself as the boyhood home of Andy Griffith and hosts an annual "Mayberry Days" festival. Local promoters and entrepreneurs use a variety of strategies "material, social, and symbolic in nature" to fashion a landscape that allows visitors to get lost in Mayberry and emotionally connect with what they see as a simpler time and place, even if it is fictional. The word "lost" is used not only to capture the sense of nostalgic escape that the town offers many tourists and some local residents, but also the sense of dislocation and marginalization that other locals feel as they live and work in the real Mount Airy. The sustainability of the Andy Griffith Show as a tourist draw ultimately depends upon addressing these tensions.	P108
Utterance length as it relates to communicative variables in infant vocal development, Joanne Naylor, Heather Ramsdell, Andrew Stuart, East Carolina University, Greenville, NC 27858 Previous studies have shown that there is a link between early infant vocalizations and subsequent speech and language abilities. However, these studies have not addressed all of the variables that may affect the vocalizations themselves. More detailed investigation into the differences in the quality of vocalizations during the first year of life is needed to provide researchers and clinicians with valuable information for tracking vocal development. Much of the infant vocalization research has addressed the quantity of utterances produced during interactions. However, the quality of infant vocalization may vary in scientifically and clinically relevant ways also. One such characteristic of infant vocalizations that could provide information is duration. Variations in the utterance duration may indicate neurological, structural, or coordination deficiencies. The goal of this study is to determine if there are any observable patterns in the utterance duration that can be associated with different vocal types, facial affects, gaze directions, and infant ages. There is no research that has investigated the effect of these variables on the duration of sounds that infants make prior to production of first words.	P109

History of a Killer: The Spread of Malaria Throughout the World, Emily Bone, Angela Thompson, East Carolina University, Greenville, NC 27858 The human form of malaria manifests itself in at least four forms, with Plasmodium falciparum, evolving into the most lethal form. Unlike viruses and bacteria which can be prevented through vaccinations, malaria has proved to be an intractable disease reeking devastation on the human race because its cause is a plasmodium. As agriculture increased in West and Central Africa, humans began to live in larger groups in close proximity to each other. Malaria is spread through a host and parasite relationship, and in this case from mosquitoes to humans. The disease followed the migration of man, spreading the disease throughout the world. The purpose of this poster will be to track the spread of malaria throughout history, highlighting major epidemics and tracing the course of treatments. Documents demonstrate the presence of malaria from ancient Greek societies, throughout Europe, Africa, the Middle East, and Asia, eventually resulting in a severe number of deaths as the disease crosses the Atlantic Ocean into the New World proving especially deadly for pregnant women and children. Malaria has often been documented as "fever and ague" but the devastation on the body is far beyond fever. The parasite destroys red corpuscles in the bloodstream, adding stress and strain to parts of the body producing blood. Before entering the bloodstream, malaria attacks the liver, growing and dividing for ten to fifteen days. The spleen becomes enlarged from attempts to sift the malaria parasites out of the blood. As white blood cells attack the malarial parasites, the victim is plagued by sharp chills and high fevers. Although treatment is available, malaria remains a deadly killer in many areas of Africa, as 20 percent of childhood deaths in Africa are from the effects of malaria. While preventable and curable, malaria disproportionately affects poor and marginalized people who have limited access to health care or cannot afford treatments. Rising rates of sickness and deaths from malaria can be attributed to the misuse of anti-malarial drugs, such as chloroquine, throughout the past century. New anti-malarial drugs, known as artemisinin based therapies have proved promising in the efforts to fight the disease but no effective vaccine is available. From its origins in West Africa, malaria has spread through the migration of man and has become one of the greatest killers to afflict mankind.	P110
17th Century Corolla Wreck: A Dynamic and Mobile Shipwreck, Daniel Brown, Brad Rogers, Department of History – Program for Maritime Studies, East Carolina University, Greenville, NC 27858 The poster will be a map of the Outer Banks between Currituck and Hatteras, inset with photos and dates of the recorded and documented locations and condition of this shipwreck as it traversed up and down the coast between 2008 and 2010. Also inset will be a site plan of the wreck, created by the Program in Maritime Studies during the 2010 Summer Field School. The final inset will be a reconstruction of what the vessel may have looked like before sinking somewhere off the eastern	P111

seaboard in the early 1600s.	
Autism in Eastern North Carolina: Stories from the Families, Karen Fieselman, Todd Savitt Autism Spectrum Disorder (ASD) is a group of developmental disabilities that affects communication, behavior, and social interactions. Autism impacts all racial, ethnic and socioeconomic groups and occurs four times more frequently in boys than in girls. The Center for Disease Control (CDC) estimates that 1 in every 110 children in the United States is diagnosed with ASD. The purpose of this study was to understand how families in Eastern North Carolina handled the diagnosis of autism and how they navigated the available resources within the region. The primary care givers for nine families living in Eastern North Carolina were interviewed for the project, each with a family member diagnosed with autism under the age of 18. The primary care giver was asked to explain how their child was diagnosed and how they found the autism resources and support systems within their immediate community. All families received their diagnosis through the Treatment and Education of Autistic and Communication related handicapped Children (TEACCH) Center or through the Children's Developmental Services Agency (CDSA). All parents concluded the most important events for the family and child were receiving proper therapies and support resources. Access to resources varied with regards to the particular decade in which the child was diagnosed, age of the child at diagnosis, location within the region and time of enrollment in State therapeutic programs and treatments. Through the interviews, it was found that all families eventually found similar resources when available within the region, but with variation in the length of time before gaining access due to how the child was diagnosed, family persistence, severity of Autism and quality of assigned case worker. It was found that many of the resources within the community are isolated from one another with no central medical or social service that connects the providers, making it a difficult and stressful process for families to navigate the autism resources of the region.	P201
Subsurface fracture distribution and influence of fractures on groundwater flow in the Piedmont and Blue Ridge physiographic provinces of North Carolina, Justin Nixon,Alex Manda, Department of Geological Sciences, East Carolina University, Greenville, NC 27858 Crystalline rocks of North Carolinas Piedmont and Blue Ridge provinces are characterized by significantly low matrix porosity (<1%), and depend on secondary porosity created through fracturing to readily transmit fluids. These fractures serve as the primary conduits that regulate groundwater movement and storage in fractured rock aquifers. Although commonly sought after for domestic water use, these complex groundwater systems are not well understood partly because it is difficult to characterize fractures in the sub-surface. Fracture analyses that are based on surface measurements of fractures may be inadequate because fracture characteristics may vary with depth. In this study, fracture attributes derived from borehole geophysical logs are used to investigate how	P204

fracture orientation and intensity vary as a function of depth in the Blue Ridge and Piedmont physiographic provinces of North Carolina. Results of this study are used to assess the influence of fracture attributes on groundwater flow and also form the basis for more rigorous geophysical logging in the future	

Undergraduate Online Submissions	ID#
The Bubonic Plague and its Effects on Medieval and Modern Day Society, Laura Stoss, East Carolina University, Greenville, NC 27858 The bubonic plague is defined as a disease manifested through the bacterium known as *Yersinia Pestis* carried by bacillus and spread through fleas and rats. There were three major outbreaks of the plague - the plague of Justinian (mid-6th century), the Black Death (mid-14th century), and the modern plague (mid-19th century). I chose to focus on the plague of Justinian and its impact on medieval society. While there are scarce primary sources surrounding this topic, such as Procopius' Secret History it is clear that the plague contributed to the demise of the Byzantine Empire and drastically impacted medieval society. Through Procopius' firsthand account of the plague, we can see that Justinian made changes concerning legislation and the economy as a reaction to the plague. The empire suffered from a loss of money and military prowess due to extreme population loss, which Justinian responded to with increased taxation and a barbarization of imperial forces. Socially, there was a decline in intellectual thought and an inclination to combine religious and political ideologies, which moved the empire towards a more theocratic state. The bacterium *Yersinia Pestis* can still be found in some instances of plague today and the plague of Justinian is therefore relevant to today's society. The clinical symptoms of the three major pandemics of plague resemble modern day plague and the bacterium is the same agent that caused earlier plagues. Even though the plague does not affect modern society as it did medieval society (because of modern medicine and prevention tactics), it is extraordinary that over the course of fifteen centuries the bacterium has survived. **References** Achtman, Mark. "Microevolution and History of the Plague Bacillus, Yersinia Pestis." Proceedings of the National Academy of Sciences of the United States of America 101, no. 51 (2004): 17837-17842. Dols, Michael W. "Plague in Early Islamic History." Journal of the American OrientalSociety 94, no. 3 (1974): 371-383. Procopius. Secret History. Translated by G.A Williamson and Peter Sarris. New York:Penguin, 1966. Russel, Josiah C. "The Earlier Plague." Demography 5, no. 1 (1968):174-184	D3

Undergraduate Oral Submissions	ID #
The Neurobehavioral Effects of Maternal Iron Status in a Rodent Model of Fetal Alcohol Spectrum Disorder, Dorothy Dobbins, Iola D Conchar, Ellen M Sheffer, Andrew Norris, Sara Afridi, Lily Medina, Tuan D Tran, Department of Biology, East Carolina University, Greenville, NC 27858 Women who consume alcohol during pregnancy are known to have children that exhibit a wide variety of physical, neural, and behavioral deficits that may persist over their lifespan. The severity of such deficits arises from various factors, allowing for categorization of syndromes that are collectively known as fetal alcohol spectrum disorders (FASD). Alcohol affects many brain regions including the cerebellum and hippocampus, which are important for different types of learning processes. Because alcoholics are often malnourished with respect to micronutrients, it is reasonable to consider whether these deficiencies could synergize with alcohol to enhance fetal brain damage. We hypothesized that a parity factor reflects the micronutrient deficiencies that frequently accompany alcoholism. Indeed, one particular factor, iron deficiency (ID), is the most common nutritional deficiency in pregnant women. ID affects 22% of women between 12-49 yr and 7% of toddlers; it strongly correlates with parity because the fetus and delivery blood losses significantly deplete iron reserves. Moreover, maternal ID causes behavioral deficits that strongly parallel those seen in FASD, suggesting that ID and alcohol may synergize to heighten alcohol s neurotoxicity. Iron-sufficient (IS) or ID rats were generated from mothers that were administered either IS (100 ppm Fe) or ID (4 ppm Fe) during pregnancy and perinatally. Their pups received alcohol (0, 3.5, 5.0 g/kg) or sham intubations (SI) from PD 4-9. At ~PD 30, they were surgically prepared for either delay or trace eyeblink classical conditioning (ECC), both well-studied forms of associative learning. Afterwards, they underwent either forms of ECC testing for three days. At ~PD 38, cerebella and hippocampi were examined for cell loss, which are known to mediate either delay or trace ECC, respectively. Results showed that ID exacerbated alcohol-induced learning deficits in both ECC tasks. Interestingly, IS protected against the impact of fetal alcohol exposure in the simpler delay ECC task, but not trace ECC. Correlative cell loss is currently being examined. These initial results help elucidate the interactive effects of maternal ID and fetal alcohol exposure, with important implications for therapeutic interventions in people afflicted with alcohol-induced neuropathology such as FASD.	O53

Pro-Tumor N2 Neutrophils May Form a Pre-Metastatic Niche, Dare Imes, Dave Milbourn, Kathryn Verbanac, Jered Cope Meyers, Keith Pittman, Department of Psychology, East Carolina University, Greenville, NC 27858

Most cancer deaths result from tumor metastases or their complications, thus it is important to understand factors that regulate their development and growth. The tissue microenvironment that supports tumor cell attachment and growth has been termed the pre-metastatic (pre-Met) niche. It has been proposed that hematopoietic bone marrow-derived progenitor cells promote this microenvironment. Neutrophils have a phenotype consistent with these cells discovered in the pre-Met niche. Tumor-infiltrating neutrophils have been isolated with an anti-tumor (N1) or pro-tumor (N2) phenotype, but there are no reports of neutrophil recruitment or distribution in pre-Met tissue. HYPOTHESIS: N2 neutrophils establish a pre-metastatic niche. METHODS: Here we describe two studies using a mouse Lewis Lung adenocarcinoma (LLC) model. We analyzed lung tissues, pre-Met and post-Met, for neutrophils, neutrophil-attracting chemokines KC and MIP2, and MCP1, a marker of the N2 subset. Mice injected sc with syngeneic LLC were sacrificed sequentially over time, before and after established lung metastases. Lung tissue was homogenized and assayed by ELISA for KC, MIP2, and MCP1. RESULTS: Neutrophil chemoattractants were significantly elevated in late (d21-23) pre-Met tissue (133 pg KC & 9.2 pg MIP2/mg protein; n=16) compared to normal lung (18.3 pg KC & 3.1 pg MIP2/mg protein; n=8; $p<0.05$). High KC:MIP2 ratios were found in all samples, characteristic of activated endothelium, ranging from 6 (normal) to 31 in early (<18d) pre-Met lungs. The N2 marker MCP1 increased steadily over time in pre-Met lung (slope=52). Compared to normal lung (20 pg/mg protein; n=5), MCP1 was significantly elevated in pre-Met tissue (185 pg/mg protein; $p<0.01$) and was the highest in metastases (867pg/mg protein). Neutrophil counts were similar in all tissues in the first study. CONCLUSION: Neutrophil-attracting chemokines were elevated in lung tissue prior to the detection of metastases. A marker of pro-tumor N2 neutrophils increased over time and preceded lung metastasis. Immunohistochemistry studies are underway to enumerate lung-infiltrating N2 neutrophils and LLC tumor cells. Our results are consistent with the premise that neutrophils provide a biological milieu that supports the attachment and growth of tumor cells at metastatic sites.

O54

The Effect of Whole Body Vibration on Spinal Excitability During Muscle Contraction,
Rebecca Mueffelmann, Tibor Hortobagyi, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858

Whole body mechanical vibration (WBV) is an emerging exercise modality in which vibration is applied to the feet by an oscillating platform and translates to the rest of the body. Recent research has demonstrated positive effect of WBV on multiple clinical conditions and on neuromuscular performance. The mechanism by which WBV exerts these positive effects is unknown. Spinal excitability is a possible explanation, but little research has been conducted. Spinal excitability can be measured by evoking and recording variations of a spinal reflex called the Hoffmann reflex. Variations include the H-superimposed (Hsup) and V waves. The purpose of this study was to examine the effect of WBV on Hsup and V wave as measures of spinal excitability. The researchers hypothesize that WBV will have an effect on spinal excitability, although it is unclear whether WBV will increase or decrease it, due to the paucity of previous research on the topic.

Methods: Ten young, healthy subjects volunteered to participate in this study. Subjects performed maximum voluntary contractions (MVC) of their right soleus muscle while the tibial nerve was stimulated in the popliteal fossa. The stimulating electrode was placed to evoke the maximum Hoffman reflex. 120% of this stimulation intensity was used during MVC to evoke a volitional wave (V wave), and 20% was used to evoke the H-superimposed wave (Hsup). Baseline measurements consisted of two Hsup and two V waves alternated with 45 seconds of rest separating each. Subjects then performed five one-minute bouts of whole body vibration exercise at 2mm amplitude and 30-Hz frequency, with each bout separated by one minute of rest. After WBV treatment, eight more Hsup and eight more V wave measurements were taken, alternating and separated by 45 seconds of rest.

Results: Hsup measurements after WBV treatment showed no change when compared to baseline, and V waves measurements exhibited a 10% decrease in size after treatment as compared with baseline measurements. WBV had a small inhibitory effect on V wave, no effect on Hsup. Because WBV appeared to inhibit spinal excitability, it is unlikely that WBV causes improvements in muscular strength and power by increasing spinal excitability. More research is needed to elucidate the mechanisms by which vibration modulates muscular performance.

O55

Transcription factor activity in nanotube induced granulomas in the lungs of mice, Janki Patel, Isham Huizar, Anagha Malur, Yasmeen Midgette, Department of Chemistry, East Carolina University, Greenville, NC 27858 Sarcoidosis is a disease characterized by collections of inflammatory cells known as granulomas, found in the lungs, heart, eyes and the nervous system. Most prevalent is the sarcoidosis of the lungs which impairs breathing and can be fatal. The collection of inflammatory cells is due to the host's immune response and is composed primarily of macrophages. Some nuclear receptors are found to play a key role in activating macrophages. Peroxisome proliferator-activated receptors (PPARs) are a family of nuclear receptors that are important in lipid and glucose metabolism and PPARgamma (γ) is a negative regulator of macrophage activation. This receptor activity is critical in the lung where it is responsible for maintaining homeostasis. PPARγ activity is disrupted in granulomatous diseases such as sarcoidosis. PPARγ has been found to have anti-inflammatory effects which could be beneficial if completely understood. Previous studies have also determined that in the presence of decreased PPARγ, increased activity of nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB) is present in alveolar macrophages from sarcoidosis patient. Recently our lab has developed an animal model of granuloma formation. Briefly, nanotubes are instilled in the lungs of mice and a granulomatous reaction occurs. These mice develop lung granulomas similar to sarcoidosis. The present study is designed to test the hypothesis that this animal model will also have reduced PPARγ and increased NF-κB activities. If the PPARγ and NF-κB activity in alveolar macrophages from mice instilled with nanotubes is similar to sarcoidosis then this mouse model can be implemented in treatment trials to develop a treatment for sarcoidosis. Analysis of BAL cells from nanotube instilled mice for PPARγ and NF-κB will performed using an ELISA based activity assay. Quantification of nuclear PPARγ and NF-κB protein will be done with confocal microscopy coupled with image analysis. In summary, if these studies provide evidence that decreased PPARγ activity and increased NF-κB activity also occurs in animal model, future mechanistic studies can be designed which may lead to new treatments for sarcoidosis.	O56
Sensory dysfunction following spinal cord injury is associated with changes in glycogen synthase kinase-3β activity, Andrew McGowan, Tiffany Lee, Kori Brewer Ph.D, Sonja Bareiss PT, Ph.D, Departments of Physical Therapy and Emergency Medicine, East Carolina University, Greenville, NC 27858 Spinal cord injury (SCI) leads to central and peripheral nervous system changes that result in sensory dysfunction. Glycogen synthase kinase-3² (GSK-3²), an intracellular protein important for growth and guidance of axonal processes potentially mediates some of the underlying cellular changes via inhibitory phosphorylation. We hypothesize that phosphorylated GSK-3² (pGSK-3²) plays a role in the sprouting of nociceptive fibers, contributing to sensory dysfunction following	O57

SCI. GSK-3² activity following SCI was analyzed in spinal cord and dorsal root ganglia (DRG) tissues. Male, Long-Evans rats underwent excitotoxic SCI through intramedullary injection of quisqualic acid (QUIS) or an equal volume of saline for controls into gray matter of the dorsal horn. Spinal cords and DRG were removed from the level of injury (T12-L2) 10-14 days after surgery. Western blot analysis indicated that compared with controls, spinal cord tissue from injured animals showed a significant increase in percent phosphorylated GSK-3² (pGSK-3²/GSK-3²) (p=0.05). A similar, but non-significant trend was observed in DRG tissues. Double immunoflourescent staining showed that pGSK-3² colocalized with nociceptive markers calcitonin gene-related peptide (CGRP) and strongly with isolectin B4 (IB4) in spinal cord and DRG tissues. Studies to determine changes in pGSK-3² expression in pain mediating cells of DRG tissue following SCI are underway. This study suggests that sensory dysfunction following SCI is associated with changes in GSK-3² activity in nociceptive neurons. This research was funded in part by ECU's Department of Research and Graduate Studies and the Wooten Foundation.	
Comparing Clustered DNA Damage Levels in Tissues Distal and Proximal to Tumors in Vivo, Anastassiya Georgiev, Department of Biology, East Carolina University, Greenville, NC 27858 Our goal was to ascertain if complex DNA damage induced by oxidative stress is capable of being exploited as a precancerous or cancer biomarker. The specific DNA damage that we assessed was the oxidatively induced non-double strand break (DSB) clustered DNA lesions (OCDLs) in B6 mice with melanomas or lung carcinoma. Comparison was performed between local and distant to the tumor tissues. We further wanted to investigate if OCDL formation could be decreased by reducing reactive oxygen species (ROS) and oxidative stress. To accomplish this, we utilized the superoxide dismutase antioxidant, Tempol.For our experiment, B16 melanoma and lung carcinoma cells were injected into B6 mice in collaboration with the National Cancer Institute. We evaluated the DNA damage in 14 various tissue samples, distal and proximal to the tumor. To assess the effects with regard to the bystander effect, an adjuvant of PBS was administered to stimulate and increase the level of inflammation which was directed to a set of PHL control mice as well as the various tissues to be analyzed for OCDLs for comparison. To conclude if reducing ROS effects OCDL accumulation, a cohort of B6 mice were fed the antioxidant Tempol. We utilized a novel adaptation of constant field get electrophoresis developed in Dr. Georgakilas' laboratory with repair enzymes as DNA damage probes. These repair enzymes, human APE1, human OGG1, and E. coli Endo III, have functional activity in vitro. Once detection of a lesion in a cluster occurs, excision of the damaged base and of the DNA strand will transpire. Each DNA strand will now display a single stranded break which, if within 1-10 base pairs, results into a double stranded break. These additional breaks are measured as clustered lesions and accessed via neutral agarose gel electrophoresis and calculated with	O58

number average length analysis (NALA).Earlier prognosis and detection of a growing tumor is a significant aspect of successful treatment. From these experiments, we hope to establish OCDLs as precancerous or cancer biomarkers in the cases of high oxidative stress associated with tumor growth. It is hopeful one day clinical biopsies can be performed to screen for this specific damage and indicate early complications and tumor growth.	
The Effects of Simulated Aquifer Storage and Recovery upon the Microbial Diversity and Load in Laboratory Microcosm Experiments, Amandeep Gujral, Department of Biology, East Carolina University, Greenville, NC 27858 Aquifer Storage and Recovery (ASR) is a water management strategy involving the storage and recovery of excess water (usually potable) in aquifers to meet both seasonal and emergency water supply needs. Although ASR plays a significant role in seasonal storage of drinking water, better knowledge of water quality changes during water storage is needed in order for water utilities to safely and more broadly apply this technique. Greenville Utilities Commission (GUC) has recently constructed North Carolina's first ASR site where potable distribution system water will be pumped down into the following deep aquifers: the Black Creek and Upper Cape Fear. Many deep aquifers have developed distinct, indigenous microbial populations which are adapted to subsurface conditions (e.g. low DO, dark). In contrast, treated surface water is often ozonated, chloraminated, and should have fewer microbes. We hypothesize that pumping Greenville distribution system water into the Black Creek and Upper Cape Fear aquifers will result in changes in the composition of native microbial populations which we can detect and quantify with our DNA fingerprinting techniques. We also hypothesize that microbes in potable drinking water will respire dissolved organic carbon in solution differently than microbes isolated from the native groundwater. To test our hypotheses, we prepared microcosms using serum vials filled microorganisms from either the natural aquifer water, the oxidized "surface" water being injected by the distribution system, or a mix of the natural aquifer water and oxidized "surface" water. The initial cell counts showed that the aquifer water had an average of 4.23 E7 cells per milliliter while tap water had an average of 1.93 E7 cells per milliliter. Water will be extracted from the microcosms at various time points to track the changes in dissolved organic carbon, microbial cell concentrations, and to identify the predominant species using DNA fingerprinting techniques. This work will elucidate the impacts of ASR upon subsurface microbial populations and their interaction with organic carbon pools; which could be applied in future studies of contaminant transport, microbial source tracking, and biogeochemical models of the North Carolina coastal plain.	O59

Potential Benefits of Cleistogamy in Triodanis, Emily Stewart, Department of Biology, East Carolina University, Greenville, NC 27858 We are studying the evolution of cleistogamy, the production of flowers that remain closed and self-fertilize, in two species in the annual plant genus Triodanis. In both T. perfoliata and T. biflora, cleistogamous (CL) and chasmogamous (CH) flowers are produced. Flowers that are chasmogamous fully open to allow cross- pollination to occur. In a greenhouse experiment, we are studying the fitness benefits of CL vs. CH flowers. Seeds were collected from both CH and CL flowers of the two species in an area where they co-occur in Greenville, North Carolina. The progeny of both flower types were raised to compare key differences in fitness measures, such as plant biomass and the number of CH/CL flowers. In addition, morphological traits that distinguish the two species were measured to estimate the extent of hybridization between the two species in CH flowers. With these traits we will determine potential benefits of cleistogamy versus chasmogamy and how each breeding system affects an individual plant's evolutionary fitness.	O60
Synthesis and Photophysical Characterization of N^C*N Tridentate Cyclometalated Platinum (II) Complexes, Deepak Ravindranathan, Dileep A.K. Vezzu, Department of Chemistry, East Carolina University, Greenville, NC 27858 Luminescent cyclometalated platinum complexes have attracted a great deal of interest because of their potential application in chemical sensors, biological labeling, photocatalysis, and organoelectronic devices such as OLED (organic light-emitting diode) devices and photovoltaic cells. In this presentation, the synthesis and photophysical properties of a series of novel, highly luminescent tridentate platinum complexes with general coordination geometry of (N^C*N)-PtCl will be reported, where "N^C" denotes a coordination of N and C atoms to the platinum to form a five-membered metallacycle and "C*N" denotes a coordination of C and N atoms to the platinum to form a six-membered metallacycle. We recently reported a series of tridentate complexes with general coordination geometry of (C^N*N)-PtL in which the geometrical change from reported C^N^N to C^N*N led to a substantial improvement in phosphorescence efficiency of the complexes. Photophysical properties such as emission, quantum yields, and lifetimes were measured with a fluorometer and absorption was measured with a UV-Vis spectrophotometer. Density functional theory calculations on the complexes to elucidate the electronic structures will be reported. The structural effect and the photophysical properties of these complexes will be further discussed based on both experimental and theoretical results.	O61

The Role of Synaptopodin-2 in Cancer Cell Differentiation, Kelli Shortt, Department of Biology, East Carolina University, Greenville, NC 27858 Synaptopodin-2 is an actin-binding protein commonly found in brain, kidney, and skeletal muscle tissues in mammals. It binds to and causes raid polymerization of G-actin, a protein that is essential in many cell functions. Synaptopodin-2 can also associate with a number of other proteins, such as myosin, calmodulin and ±-actinin. Association with ±-actinin promotes the translocation of synaptopodin-2 from the cytoplasm to the nucleus, where it is involved with the chromatin-remodeling complex and therefore transcriptional activity. Recent studies have shown that myopodin, a homologue of synaptopodin, can act as a tumor suppressor gene and is frequently deleted in invasive prostate cancers and silenced by hypermethylation in bladder cancer. My research goal is to analyze the expression of synaptopodin-2 during the different phases of the cell cycle using a colon cancer cell line HT29. My hypothesis states that synaptopodin-2 will have a different expression pattern during different phases of the cell cycle. To test this hypothesis, a technique called a double-thymidine block will be used to synchronize the HT29 cells. The localization of synaptopodin-2 will be analyzed after arresting the cells at different phases of the cell cycle by immunofluorescence using a specific monoclonal antibody. I hope to confirm a pattern similar to other cancers that will help in understanding the role of synaptopodin-2 in oncogenesis and inspire more research in this field.	O62
FoodMASTER: Utilizing Hands-on, Food-based Lessons to Introduce New Foods in the Preschool Classroom, Ashley Roseno, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 Rather than reject new foods based on taste, young children may reject them due to unfamiliarity. Research shows repeated exposure to new foods may increase young children's familiarity and preference for those foods. The objective of this study was to engage preschool children in hands-on, food-based nutrition education, providing them with the opportunity to explore new foods in a familiar and supportive environment. The FoodMASTER Initiative partnered with Head Start to develop and implement nutrition education geared towards introducing a variety of familiar and unfamiliar nuts and seeds. Children were engaged in two-weeks of daily 30-minute lessons that encouraged food exploration. Implementation occurred in two classrooms (n=25) and two classrooms served as control (n=18). IRB approval and informed consent was obtained prior to implementation. Photographed foods in combination with a five-point Likert scale (1= really sad, 5 = really happy) were used to measure food preference pre- and post-test. Pre-test data indicated the majority of children were unfamiliar with the nuts and seeds introduced. Post-test data indicated after exposure to the targeted nuts and seeds, children preferred the taste of almonds (μ=3.86,	O63

SD=1.46), pistachios (μ=4.00, SD=1.20), pumpkin seeds μ=3.75, SD=1.25), sunflower seeds (μ=4.05, SD=1.14) and sunbutter (μ=3.88, SD=1.27). Children were also able to identify almonds (μ=1.75), pistachios (μ=1.95) and sunflower seeds (μ=1.80) as better for their bodies when compared to other snacks at post-test (1=no, 2=yes).Introducing new foods to young children using hands-on, food-based nutrition education is a promising method to promote healthier food choices in young children.	
Differential expression of FABP in both parenchymal and non-parenchymal liver cells following chronic ethanol exposure., Sherri Moore, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 Fatty acid-binding proteins (FABP) are a family of tissue specific protein molecules involved in intracellular transport of lipids and are implicated in the regulation of hepatic macrophages and T-cells. The hypothesis is that abnormal expression of FABPs allows altered lipid metabolism and signaling in liver cells causing hepatosteatosis as well as hepatic fibrosis associated with alcoholic liver disease. Experiments were designed to determine the expression of FABP isoforms in ethanol-induced liver disease. Mice were fed control or Lieber-DeCarli liquid diet containing 6% ethanol for 1 and 4 weeks, and whole liver, spleen and liver non-parenchymal cells were harvested. FABP expression was determined by RT PCR and Western blot. The expression of L-FABP was blunted in livers of mice exposed to ethanol; whereas E-FABP expression was increased after ethanol exposure. L-FABP and E-FABP immunohistochemistry was also performed on liver and spleen and was co-localized to hepatocytes and non-parechymal cells, respectively. These data suggest that ethanol alters hepatic expression of key FABP isoforms. The blunted expression of L-FABP in hepatocytes may underlie the increase in lipid accumulation; whereas increased expression of E-FABP in macrophages and lymphocytes may be related to cytokine production in response to increased hepatic triglycerides.	O64

An Interpretive Phenomenological Approach: The need to serve among hospitality professionals. Chelsey Leffet, Alleah Crawford, Department of Hospitality Management, East Carolina University, Greenville, NC 27858 The hospitality industry is faced with increased turnover rates and saturation of the market. Consumer expectations force businesses to offer superior service. Competitive differentiation can be obtained through the quality of employee-customer exchanges in an organization (Mattila & Enz, 2002; Solnet, 2006). Schneider, White, and Paul (1998) define service climate as the service-related acts, processes, and performances that get recognized and supported within an organization. Directly connected to service climate are the attitudes and behaviors that effect the interaction between an organization and its customers, known as service orientation (Hogan, Hogan, & Busch, 1984). Chandrasekhar (2001) states that service orientation may be a dispositional concept. Dispositional traits account for job attitudes that are consistent within individuals, showing stability both over time and across situations (Staw & Ross, 1985). The purpose of this research is to better understand the relationship between personality and service and to investigate the need to serve as a potential personality trait. Eleven managers with service related experience and knowledge were interviewed for this study. Five lodging, four restaurant, and two bed and breakfast managers were interviewed using a funneling technique. Voice recorded interviews lasted for about an hour and were transcribed. The interviews aimed to gain an understanding of how industry professionals view service. Transcripts were assessed using two coders to increase reliability. Data was cross-checked subjectively between the coders. This study used the interpretive phenomenological approach (IPA). According to IPA format, three questions were used to analyze the data: what is service, how is service conceived, and how does service develop in an individual's personality. This method was selected due to its fit with the sample, in that worker and work form one entity through the lived experience of work" (Sandberg, 2000, p. 11). Trends have emerged from the data that reveal similarities in hospitality manager's views of service. Similar characteristics and ideals among service professionals presented in the collected data support the notion that the need to serve may be dispositional in nature. Data analyses are still being conducted and initial results will be reported at the Research and Creativity Activity Week	O65
ECU-Greene County Partnership to Improve School-Based Mental Health: The Relationship of Adjustment, Stress, and Knowledge in Undergraduate College Students to Succeed as a Tutor of At-Risk Middle School Students, Samantha Scuderi, Department of Psychology, East Carolina University, Greenville, NC 27858	O66

The purpose of the research is to determine the relationship between adjustment, stress, coping skills, and knowledge of behavioral principles in undergraduate college students and their effectiveness as tutors for at-risk middle school students. The significance is aid in recruitment and training of future tutors or volunteers. There is no research on undergraduate college tutors with middle school tutees and this could add to the literature. My role in this project is to find the relationship of adjustment, stress, knowledge in undergraduate college students to succeed as a tutor of at-risk middle school students of the ECU-Greene County Partnership to Improve School-Based Mental Health Services. The methodology is first to receive consent, pretest with the independent variables, tutor training, participate in tutoring, and post test to gather data on the dependent variables and a knowledge test. The control group in this study is undergraduates who volunteered for a Family Gala in Greene County that provided relationship-building techniques for at-risk children and their families. Finally, to determine if there is correlation between the independent variables, which are stress, coping, adjustment, knowledge, and the change in dependent variables, the changes of the tutors stress, coping, adjustment, and knowledge. The findings of this research will help foresee possible issues with tutors or volunteers.	
The Association Between Big Five Personality Characteristics and Frequency of Obsessive Relational Intrusion Incidents, Mary Madrake, Department of Psychology, East Carolina University, Greenville, NC 27858 Most of the past research on personality characteristics and stalking has focused on stalkers, not victims. Additionally, when research is on victims, relationships to victimology tend to bear on traits specific to individuals who have grown up in dysfunctional circumstances rather than the range of personality characteristics in the general population. There have been very few studies done on personality and demographic characteristics of stalking/obsessive relational intrusion (ORI) victims. ORI may be defined as an unwanted and repeated pursuit by a stranger or acquaintance, because he or she desires or sometimes assumes, an intimate relationship with the victim. There has been research showing a negative correlation between assertiveness and risk of victimization, but no one has investigated how the normal range of personality characteristics that occur in the general population could predict stalking/ORI. The purpose of this study is to determine what, if any, Big 5 personality traits and demographics are the best predictors of ORI/stalking reports on college campuses. Ninety-five participants, 21 males and 74 females, were given a demographic survey, leisure activities survey, Big 5 personality scale, and an obsessive relational intrusion scale. Data will be analyzed using a multiple linear regression analysis, with demographic and leisure activities controlled for.	O67

Computer-Based Cognitive Rehabilitation in Pediatric Cancer Patients and Survivors, Eden Rouse, Tamara Warner[1], Brody School of Medicine, East Carolina University, Greenville, NC 27858 [1]Department of Psychology, HCAS. Many children treated for cancer experience cognitive late effects, including problems with attention and working memory, as a result of chemotherapy and/or radiation therapies. Very few empirically-supported treatments exist to address cognitive late effects, which can have significant effects on school and work performance as well as quality of life. Computer-based cognitive rehabilitation has been used with children to remediate attention problems and learning disabilities, both developmental and acquired. This project aims to assess the feasibility and effectiveness of a computer-based cognitive rehabilitation program in improving attention and working memory of pediatric cancer patients and survivors ages 6 to 20 years. Exclusion criteria include a history of head injury involving loss of consciousness or seizure disorder and non-native English speakers. Participants are administered an assessment battery consisting of well-validated measures of cognitive functioning to determine study eligibility (Full Scale IQ score > 65 and at least one impaired measure of attention or working memory) and to collect baseline data. Eligible participants proceed to the treatment phase, which consists of 15 one-hour computer-based cognitive rehabilitation sessions to be completed over a 5- to 8-week period. A software program called Captain's Log (BrainTrain) that is designed to improve attention, working memory and other cognitive skills is used for the cognitive rehabilitation sessions. The treatment sessions involved individual sessions 3- to 4- times per week with a trained "coach" who guides the participant through increasingly more difficulty video game-like activities. After completion of the training sessions, a post-treatment assessment to assess the effectiveness of the rehabilitation program will be completed. This study employs a single-case design with repeated measures. The participants are two adolescent males with acute lymphoblastic leukemia (ALL): a 12-year-old patient who is still in active treatment and a 19-year-old survivor who was diagnosed at age 3. Statistical analyses include Student's t-test comparisons using reliable change scores on pre- and post-assessment measures.	O68
Updating Visitor Profiles at the USS North Carolina Battleship: 2010-2011, Melissa Sayre, Melissa Emery,Sandra Power,Virgina Annab, Department of Hospitality Management, East Carolina University, Greenville, NC 27858 The purpose of this research is to update visitor profiles at the North Carolina Battleship Memorial. Due to societal factors, such as economic stress and technology, the nature of tourism has changed. Because of these changes, the researchers were contacted in the fall of 2010 by the destination manager to assist with developing a strategic marketing program. The study of human behavioral traits and patterns did not fully evolve until the mid-1960s	O69

(Demby, 1994). Although psychographic research has been variously called "lifestyle," "psychographic," or "activity and attitude" (Wells, 1975, p. 196), the blend of studies combines the objectivity of the personality inventory with the rich, consumer-based detail of qualitative motivation investigations. Wells (1975) concluded that psychographics can be operationally defined as: "quantitative research intended to place consumers on psychological " as distinguished from demographic "dimensions" (p. 197). This type of specialized research first impacted the hospitality and tourism industry in the United States in 1972. Researchers will continue to utilize iPads as a primary method of data collection. Paper copies of the instrument will be available to visitors upon request. The instrument will consist of 55 psychographic and demographic items. The psychographic items are measured on a 9 point Likert scale. Data collection began on 29 October 2010 and will continue until 28 October 2011. Data will continue to be captured via the survey instrument that is still deployed on Qualtrics. Data will be analyzed using the Statistical Package for the Social Sciences (SPSS, v. 18.0). A total of 113 usable instruments were collected during the fall of 2010. Since these data were collected during the off season, the researchers expect to generate an increase in the number of participants throughout the remainder of the data collection period. Encouraging the use of iPads may assist in the elimination of errors resulting from manual data entry, which will reduce the number of unusable surveys. **References** Demby, E. (1994). Psychographics revisited: The birth of a technique. Marketing Research, 6 (2), 26-29. Wells, W. (1975). Psychographics: A critical review. Journal of MarketingResearch, 12 (5), 196-213.	
"Here we don't die, we shop": The role of the Supermarket in Don DeLillo's White Noise, Megan Oakes, Department of English, East Carolina University, Greenville, NC 27858 My research has found that criticism of Don DeLillo's White Noise has focused on the novel as an analytical exploration into the problems of modern American consumer society. The issues of the environment and the many forms of pollution within the novel are treated as secondary concerns used to only explore cultural discourses. Using the environment as a mere subplot replicates the cultural viewpoint that lies at the heart of environmental crises: the idea that the environment is simply "there" for our intellectual and material needs. Within the novel, DeLillo highlights the supermarket because it is where the American (and Global) environment meets American culture. At the supermarket, food, humankind s most basic interaction with nature, becomes a consumer product, exposed to pesticides, herbicides, and growth hormones. The supermarket separates the product from the means of production. This is true of many of the forms of toxicity found within the novel, including the Airborne Toxic Event. For protagonist Jack Gladney, the very act of going to the supermarket is a denial of death both physically in	O70

terms of hunger and spiritually in terms of his consumer experience. Here the supermarket is a result of the false separation modern society has created between nature and culture, means of production and product.	
Nags Head Sustainable Feasability Study, Brenna Laffey, Department of Interior Design and Merchandise, East Carolina University, Greenville, NC 27858 A civic group and one of the property management companies are attempting to establish Nags Head as a tourist destination that is environmentally concerned. This means the homes and condominium units would meet the latest standards in environmental design to encourage tourists who want to stay at a "blue/ green" destination. LEED (Leadership in Energy and Environmental Design) certification criteria are to be used as the basis of this analysis. In this study we evaluated the options for sustainable renovations of Outer Banks vacation rental properties, setting a model for determining environmental, economic, and aesthetic impact of these suggested renovations.	O71
Piero della Francesca: A New Perspective on "The Flagellation of Christ", Allie Craver, Department of Art, East Carolina University, Greenville, NC 27858 Piero della Francesca (c. 1415 - October 12, 1492) was an Italian artist of the Early Renaissance. He is especially known for the integration of geometry in his compositions. Ironically, in less than a century after Piero's death, his artworks were forgotten and his major altarpieces were in disuse. Had it not been for his mathematical treatises, inspiring future investigations of linear perspective, Piero and his art would have been erased from history. Piero, an ambitious scholar, designed his own rules for foreshortening the human head, cube, and columns. He was able to analyze the positioning of these objects to stimulate depth. However, his peculiar arrangement of figures in ambiguous compositions has sparked disputes amongst art historians. Since Francesca's death around 1492, his life and artworks have remained enigmatic. My paper focuses on one of Francesca's works, arguably his best painting, The Flagellation of Christ. Scholars not only debate the date but also the identity of the figures represented in this singular piece. The Flagellation of Christ remains a mystery to the art world but the aesthetic appeal of its linear perspective is undeniable.	O72

Media Influences on Sexual Socialization Among Emerging Adults. Aisha Powell, Department of Child Development and Family Relationships, East Carolina University, Greenville, NC 27858 Recently mass media has become influential in America due to the influx of television, internet, magazines, and music videos that are readily available to people of all ages. For young people, the mass media is important as they are developing their own sexual beliefs and patterns or behavior (Brown, 2002). However, mass media depicts sex, gender roles, and sexuality in a favorable manner, focusing only on the positive aspects of sex rather than the problems and risks. This study looks into how television, internet, magazines, and music videos affected the sexual socialization of emerging adults. This qualitative research study includes interviews with 10 females and 10 males attending East Carolina University. Based on interviews there were three common themes found representation of women, behavior changes and the desensitization of sexuality.	O73

Undergraduate Poster Abstracts	ID #
Perceptions of a Healthy Weight Status in Obese Adolescents: Implications for a Healthy Weight Treatment Program, Steffany Martin, Vanessa Buonopane, Emily Steinbaugh, Marissa Errikson, Dustin Burrell, David Collier, Lesley Lutes, East Carolina University, Greenville, NC 27858 Obesity is a growing health concern in adolescents, with African-Americans (AA) being disproportionately at greater risk. Given the long-term impact of obesity on morbidity and mortality, it is imperative that we understand contributors to overweight and obesity so we may develop early interventions. Misperceptions of a healthy weight status have been suggested to be a contributing factor. Adolescents may not recognize the extent of their overweight, which may impact weight loss attempts and success. While research suggests that the AA population may have a higher ideal weight status than other ethnic groups, to our knowledge, this has not been assessed in adolescents. The purpose of the present study is to determine adolescent AA perceptions of a healthy weight compared to the ideal healthy weight determined by the Centers for Disease Control. Fifteen morbidly obese (Body Mass Index [BMI] M = 41.14, SD = 8.13) male (n = 4) and female (n = 11) adolescents, ages 12-16 (M = 14.13, SD = 1.55), participated in a 3-week residential healthy weight summer camp. Participants completed a physical health assessment and self-report questionnaires assessing weight perceptions. The adolescents perceptions of a healthy BMI were significantly higher (M = 27.27, SD = 3.94) than the ideal healthy BMI (M = 23.13, SD = 1.15) according to BMI based on percentiles for their age and gender, t (14) = 4.29, p = .001. Findings show that the adolescents significantly overestimated their ideal healthy BMI. Adolescents may not understand the extent of their overweight, which may mediate motivation to lose weight and cause adolescents to underestimate their weight loss needs. These results may reflect a family history of overweight, common peer overweight, or a need for further education regarding healthy weight. Future research should examine the potential impact of increasing awareness of weight status in adolescents on resulting weight loss across time.	P69
Peripheral Nociceptive Sprouting After Spinal Cord Injury Correlates With Pain Behaviors, Tiffany Lee, Kristin Hernandez SPT, Kori Brewer Ph.D, Sonja Bareiss PT, Ph.D, Departments of Physical Therapy and Emergency Medicine, East Carolina University, Greenville, NC 27858 There are many severe and disabling ramifications of spinal cord injury (SCI) including chronic neuropathic pain. Recent experimental evidence has shown alterations in peripheral nervous system structure which was correlated with SCI pain. We hypothesized that peripheral afferent sprouting of dorsal root ganglia neurons contributes to the development of SCI pain. We tested our hypothesis using a rodent SCI model. Male, Long Evan rats underwent excitotoxic SCI through dorsal gray	P112

matter injection of quisqualic acid (QUIS; n=8) or an equal volume of saline for controls (n=6). Animals were examined daily for overgrooming behavior and at 14 days after injury for changes in thermal sensitivity. Fourteen days after SCI, dorsal root ganglia (DRG) were removed from the level of injury. The DRG ipsilateral to the site of injury were cultured and analyzed for neuronal subtype as well as neurite length and branching. SCI animals demonstrated a significant increase in thermal sensitivity (evoked pain) from baseline ($p=0.04$) and 3 of the 8 animals demonstrated overgrooming behavior (spontaneous pain). DRG from SCI animals showed enhanced sprouting compared to controls. The percent of neurons with branching was 25.7% for saline controls while QUIS-injected animals showed a significant ($p < 0.001$) increase in the number of branching neurons (QUIS-nongroomers 48.6%, QUIS-groomers 40.0%). The average maximum length of neurites in QUIS grooming animals (89.1 ¼m+ 7.4 ¼m) was significantly greater ($p < 0.05$) than for QUIS-nongroomers (49.8 + 5.1 ¼m) or saline animals (28.7 ¼m + 3.1 ¼m). Staining of cultured neurons with CGRP and IB4 antibodies identified some of the sprouting neurons as nociceptive. Our results show that excitotoxic SCI resulted in peripheral nociceptive sprouting, with the extent of sprouting correlating with the occurrence of pain behaviors. We anticipate that future studies targeting the control of peripheral nervous system sprouting may serve as a candidate for SCI pain therapies. This research was funded in part by ECU's URCA award and the Wooten Foundation.	
Epigenetic Effect of Paternal High Fat Diet on Offspring Susceptibility to Glucose Intolerance in Mice, Maneesh Jeyakumar, Matthew Parker, East Carolina University, Greenville, NC 27858 National statistics demonstrate continued increases in overweight and obesity among children over the past three decades (Loomba et al., 2008). Several lines of evidence indicate that obese (Loomba et al., 2008) and diabetic fathers (Harjutsalo et al., 2006) are likely to have obese offspring predisposed to diabetes. The molecular basis for these nongenetic transgenerational effects is unknown, but likely involves epigenetic modifications in the methylation state of DNA, histones and microRNAs (Handel et al., 2010). Our current research tests the hypothesis that exposure of male mice to high fat diet will increase susceptibility of their offspring to obesity and glucose intolerance. We further presume that this phenotypic change will be linked to alteration in DNA methylation, gene and miRNA expression. Four-week old C57 Black male mice were divided into three groups: a group with 60%-fat chow, a control group with 10% fat chow and an exercise group on 10% fat chow. The mice were exposed to their diet regiment for 12 weeks. Glucose tolerance tests and metabolic cages assessed changes in their metabolic profiles. An MRI was used to measure changes in body composition. After 12 weeks of treatment, the body weight increase in mice differed between groups: 27.6% control, 114% fat diet, 39.8% wheel group. The data from the glucose tolerance tests showed that one hour after injection with 50% dextrose, the glucose levels of the mice changed over the 12 weeks: the control group had a 32.7% increase, the fat diet group had a 70.3% increase, the exercise group had a 6.2% decrease. This data shows that male mice on high-fat diet have lower tolerance to glucose and a higher body fat composition than control and exercise groups.	P113

All males were mated with normal C57Black 7-week old female mice. The offspring will be monitored for changes in developmental pattern and body weight curve. Upon reaching 5 weeks, half of the offspring will be subjected to 60% fat diet for 12 weeks and half will be used as controls on regular mouse chow. Tissue collected from fathers and offspring will be screened for genome-wide changes in DNA methylation pattern. We anticipate differences in susceptibility to diabetes between offspring of high-fat fathers and offspring of control and exercise groups.	
Yeast two hybrid interaction studies, Wayne Rummings, Department of Biology, East Carolina University, Greenville, NC 27858 The lab that I perform research in investigates the proteins involved in eukaryotic DNA replication using interaction studies in yeast, as well as both genetic and phenotypic analysis in Drosophila melanogaster. My research thus far has been centered around the roles of Mcm10 in replication. The protein encoded by this gene is one of the highly conserved mini-chromosome maintenance proteins (MCM) that are involved in the initiation of eukaryotic genome replication and has been shown to be involved with heterochromatin formation (Apger et al 2010). To this point, my role has been to clone eleven genes in preparation for yeast two-hybrid interaction studies with Mcm10, as well as preparing growth media for the lab, and maintaining fly stocks. This process of cloning has consisted of successfully amplifying DNA via polymerase chain reactions (PCR), verifying results through agarose gel electrophoresis, and subsequently cloning the PCR products into bacterial plasmid. These clones were then used to generate yeast two-hybrid vectors. My endeavors have provided the starting materials for many projects in the lab and have opened doors for future work for myself and other students conducting molecular genetic analysis in Drosophila. I propose to use yeast two-hybrid interaction studies to characterize the domains of Mcm10 that are responsible for interactions with the genes I have cloned. Through this process I plan to elucidate the regions responsible for these interactions at a 200aa resolution. The progression of this work will further the knowledge of the interaction networks of Mcm10, contribute to the understanding of eukaryotic replication initiation, continue to define the role of Mcm10 in replication and chromatin dynamics, as well as aiding in the basic understanding of cell proliferation and mechanisms of cancer.	P114
Regulation of Connexin 43 by Cyclic AMP in Vascular Smooth Muscle, Danielle Martin, Jonathan C. Fox, Chintamani N. Joshi, David A. Tulis, Department of Biology, East Carolina University, Greenville, NC 27858 Connexin 43 (Cx43) is the predominant gap junction protein in vascular smooth muscle cells (VSMCs) and plays important roles in maintaining normal vascular function as well as in the response to disease or injury. Connexins are trans-membrane proteins that facilitate intercellular communication by regulating movement of ions and other signaling molecules, including cyclic nucleotides, through gap junction intercellular communications (GJICs). The physiologic efficacy of	P115

GJICs is a function of both connexin expression and phosphorylation. The current studies aimed at understanding the effects of cyclic nucleotides on Cx43 expression and functionality including site-specific phosphorylation in rat primary VSMCs. Using direct-activating cyclic nucleotide analogues, conventional Western and newer In-Cell Western (ICW) assays, both cyclic adenosine 3',5'-monophosphate (AMP) and cyclic guanosine 3',5'-monophosphate (GMP) significantly stimulated total Cx43 protein expression in VSMCs after 270 minutes. Using the Lucifer Yellow (LY) assay to estimate GJIC permeability, only cyclic AMP significantly increased transmission of the LY dye (after 30 min) whereas cyclic GMP did not exert noticeable effects. Considering this stimulatory impact of cyclic AMP on GJIC, we then studied site-specific Cx43 phosphorylation in response to cyclic AMP induction. Connexin 43 has multiple phosphorylation sites: Serine (Ser) 255 and Ser279 are mitogen-activated protein kinase (MAPK)-specific; Tyrosine (Tyr) 262 is activated by the cyclin cdc2; Tyr265 is activated by the proto-oncogene v-src; and Ser368 is a PK-C-inhibitory site. Following cyclic AMP stimulation (30 min), a marked increase in Cx43 Ser279 phosphorylation was observed ($p = 0.073$), indicating potential MAPK involvement; however, cyclic AMP failed to exert noticeable effects in the phosphorylation of Cx43 at sites 255, 262, 265 or 368. These data show that cyclic AMP has capacity to stimulate VSM GJIC expression and activity, which may be mediated in part by the MAPK pathway. In summary, these findings provide key mechanistic insight into VSM cell-to-cell communication and may provide a future target for cardiovascular therapies.	
Effects of GPR4 on Tumor Cell Migration and Proliferation, Jatin Patel, Reid Castellone, Li Yang, Department of Chemistry, East Carolina University, Greenville, NC 27858 GPR4, a G protein-coupled receptor, serves as a membrane bound proton sensor for the extracellular environment. GPR4 is found in many cancer cells, and with acidosis, the tumor microenvironment is ideal for activation of the receptor. The purpose of this study is to investigate how the activation of GPR4 affects the tumor cells' ability to migrate as well as the ability to proliferate. Cell migration assays were completed with TRAMP prostate cancer cells to observe cell motility in media with varying pH. The results indicate that GPR4 is indeed activated at an acidic pH and results in decreased migratory ability of the cells. Similar results were gathered with a B16F10 melanoma cell migration assay. The in vivo model shows a similar trend. Mice tail injections using vector and GPR4 B16F10 cells showed a statistically significant decreased ability of the GPR4 over-expressed melanoma to metastasize in the lungs. Cell proliferation assays were completed on B16F10 melanoma cells to observe growth trend difference between cells genetically engineered to over-express the vector or the GPR4. There was a slight, but statistically significant decrease in proliferative ability of the GPR4 over-expressed cells compared to the over-expressed vector. However, when the varying pH assay is taken into account, the significance is, to a large extent, not present. Although preliminary studies show that over-expression of the vector leads to greater quantitative cell proliferation, the pH assays show a reduction in difference; the understanding seems to be vague. Further studies need to be done in order to reveal to what extent over-expression of the vector and GPR4 have effect on cell proliferation.	P116

Overall, the data suggests that GPR4 indeed is activated at an acidic pH. While the figures for how GPR4 activation affects the cell proliferation are inconclusive, the biological aspects involving migration are strongly suggestive of a dramatic outcome. The experiments demonstrate that activating GPR4 leads to a significant decrease in a cell's ability to migrate and metastasize.	
ANALYSIS of COMPLEX DNA DAMAGE ASSOCIATED WITH TUMOR GROWTH, Nicholas Ferguson, Department of Biology, East Carolina University, Greenville, NC 27858 The questions being asked: What is the level of DNA damage induced by Melanoma in surrounding B6 mouse tissues compared to DNA damage of a control B6 mouse? How effectively does Tempol antioxidant remove oxidative damage compared to non-Tempol treated B6 mice? The objectives of this project: To understand the relationship in which Melanoma growth will induce a higher amount of OCDLs (oxidatively induced clustered DNA lesions) in B6 mice bearing the tumor than in non-Melanoma B6 mice tissues. Tempol is expected to reverse the presence carcinoma, in the second portion of this experiment by decreasing the levels of complex DNA lesions induced. In this experiment a Melanoma mass will be implanted into sets of B6 mice, while a control group of B6 mice will be injected with PBS (Phosphate Buffer Solution). The brain, liver, kidney, ovary, lung, spleen, duodenum, stomach, colon, rectum, skin, skin adjacent, skin normal dorsal and the tumor mass tissue samples will be removed and analyzed for the presence of OCDLs. The tissues will have the DNA extracted and tested via 7.5 pH neutral 0.8% agarose gel electrophoresis; each sample will be tested using three individual enzymes (APE1, OGG1, ENDO III), at which point a Hind III marker will be used to quantify samples against two times. APE1 primarily cleaves abasic sites, OGG1 cleaves oxypurine sites and ENDO III primarily cleaves oxypyrimidine sites on DNA (New England Biolabs). The use of a 0.8% neutral gel electrophoresis will be employed to provide a sensitive and direct quantitative method, utilized to separate the fragmented DNA after the samples have been cleaved by the enzymatic probing. Number average length analyses (NALA), via computer programs QuantiScan and Origin, will be used to determine and quantify OCDLs against Hind III digested markers. The migration of DNA will be determined in QuantiScan (2004) which has sophisticated lane processing and analysis for gels. Origin 6.1 is used to graph points of the marker to get a regression number value close to 1, and then this gives values which are then input into Excel and used to directly analyze the area of each sample. For each sample there will be an enzyme free sample and an enzyme treated sample that are run on agarose gel analysis. This will allow the measurement of double strand and close proximity single strand DNA breaks.	P117
Variability in TMS-induced motor evoked potentials in the Tibialis Anterior at different stimulation intensities. William Churchwell, Jaime Talent, Paul DeVita, Tibor Hortobagyi, Gilbert Howatson, Steve Wiggins ,Patrick Rider, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858	P118

Transcranial magnetic stimulation (TMS) is a noninvasive way of stimulating the motor cortex to elicit a motor evoked potential (MEP) in a muscle. In general, upper extremity muscles are easier to stimulate using this method because of their high innervation ratios compared to leg muscles and consequently the majority of TMS research is done using the upper extremity. High innervation ratios in the upper extremity are needed for fine motor tasks and accurate muscle force production. The tibialis anterior (TA) muscle controls the toe lift aspect of the foot during the swing phase of gait which is considered a fine motor task having accurate force production and previous research suggests that the TA's innervation ratio is similar to those of the hand muscles. However, few studies have examined TMS induced MEPs in the TA. The purpose of this study was to assess the day to day variability in TMS evoked MEPs in the TA and in response to varying stimulator output intensities. A double cone coil was used to administer TMS to 6 healthy young (26 ± 4 yrs) male adults during a series of voluntary contractions. Maximal voluntary contractions (MVC) were performed for both eccentric (ECC) and concentric (CON) contractions of the TA muscle. Five pulses were administered at different stimulator output percentages of resting MEP for a total of 20 stimulations per contraction, giving the subject 60 stimulations overall. Each subject was asked to contract at 15% of MVC for the contraction type, as well as a third condition of an ECC contraction at 15% CON MVC (Econ). The sequences of contractions and stimulator outputs were randomized. During CON, ECC and Econ conditions mean absolute MEP's (mV) were 0.37 ± 0.34, 0.30 ±0.34, and 0.30 ±0.32 greater day 2 vs. day 1, corresponding to a 30%, 26%, 30% mean difference, respectively. The relative differences to max MEP were 0.05mV ±0.18, 0.06mV ±0.16, and 0.06mV ±0.16 in day 1 vs. day 2, corresponding to a 10%, 12%, and 11% difference. Mean maximum MEP was 52% greater on Day 2 (3.76 mV ± 1.74) vs. Day 1 (2.48 ± .61). Dependability improved when using relative percent differences as opposed to absolute MEP percent differences. Due to large differences in maximum MEP between days, relative MEP's to maximum MEP's seems to be a more reliable measure for comparisons.	
Repeatability of Motor Evoked Potentials Produced by TMS During Increasing Intensity of Muscle Contraction in the Tibialis Anterior Muscle. Steven Wiggins, Patrick Rider, Paul DeVita, Glyn Howatson, Tibor Hortobagyi, Jamie Tallent, William Churchwell, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Transcranial magnetic stimulation (TMS) is a commonly used, noninvasive, method to excite targeted skeletal muscles. The resulting response is known as a motor evoked potential (MEP) which can be measured in the muscle using electromyography (EMG). Many TMS protocols use the muscles of the upper extremities because they are typically well innervated and easily stimulated using TMS. Most leg muscles however, have different characteristics from arm muscles, except for the tibialis anterior (TA). The TA is more difficult to stimulate using TMS leading to minimal study of this muscle in TMS research. Purpose: The purpose of this study was to determine the repeatability of MEP responses to TMS in the TA in different contraction types and intensities. Methods: TMS was administered, using a double cone coil, on 6 healthy young (26 ± 4 yrs) males.	P119

Surface EMG electrodes were placed on the TA muscle. Subjects performed maximal voluntary contractions (MVC), using the TA, followed by a series of contractions at various intensities (10%, 25%, 50%, and 80% of MVC). These contractions were performed concentrically, eccentrically, and eccentrically-at-concentric %MVC. Five contractions were performed for each condition, during which a TMS pulse was administered and resultant MEP recorded. Results: The data showed that during concentric contractions MEP, (|mV|), were 0.302 ±0.413 less on Day 1 than Day 2, corresponding to an 18.5% difference. MEPs for the eccentric and eccentric-at-concentric contractions were 0.309 ±0.303 and 0.385 ±0.341 less on Day 1 than Day 2, corresponding to 21.5% and 27.9% differences, respectively. For the relative MEP (calculated as absolute MEP/Mmax) the concentric contractions were 0.124 ±0.160 greater on Day 1 than Day 2, with a 16.3% difference. Relative MEPs for the eccentric and eccentric-at-concentric contractions were 0.097 ±0.193 and 0.070 ±0.173 greater on Day 1 than Day 2, with 15.9% and 11.6% differences, respectively. The mean Mmax (mV) was 2.480 on Day 1 and 3.757 on Day 2. Conclusions: Due to the large variation in Mmax values from Day 1 to Day 2, it appears that using relative MEP calculations for future TMS studies of the TA muscle would have a greater chance of producing repeatable results.	
Immune Regulation Effects of the Poxvirus A35R Virulence Gene on Splenic Lymphocyte Populations, Parteek Singla, Kristina Rehm, Rachel Roper, Brody School of Medicine, East Carolina University, Greenville, NC 27858 Smallpox was eradicated from nature; however, there are concerns about its use in bioterrorism, and other poxiruses are emerging as human pathogens. Vaccinia virus is used as the live attenuated virus vaccine for smallpox and monkeypox, but it retains some virulence and can cause severe reactions, including death. Due to its poor safety record, vaccination with this vaccine is contraindicated in approximately 25% of the US population. The lack of approved anti-poxviral drugs and safe vaccines places poxvirus research at the forefront in order to counter bioterrorism and aid in the development of vaccines that can safely and effectively protect humans from poxvirus infection. We have shown that the highly conserved poxvirus A35R gene restricts antigen presentation in vitro. When A35R is knocked out of the virus to create an A35R deletion mutant, the virus becomes attenuated and immune responses are improved in mice. This correlates with enlarged spleens in the mice, possibly due to proliferation of virus-specific immune cells. This project compares the responses and phenotypes of splenocyte populations between parental virus and A35R deletion mutant-vaccinated mice to understand the mechanism of A35R immunosuppression. Since we have shown that A35R blocks class II MHC mediated antigen presentation to CD4+ T lymphocytes, our hypothesis was that A35R decreases the CD4+ T cell helper responses and all subsequent responses dependent on CD4 T cell activation (CD8, B cell). Mice were vaccinated with vaccinia virus (parental and A35Del), splenocytes harvested, and cell populations were quantified using multi-fluorescent staining and flow cytometry. We have found that the A35R gene perturbs populations of CD8+ T cells, dendritic cells, granulocytes, NK cells and macrophages. Further studies will be required to assess how A35 affects leukocyte populations in target organs such as lung.	P120

The Effects Of Growth Factors On The Mitochondrial Physiology Of Human Mesenchymal Stem Cells, Arun Ajmera[1], Ethan Anderson[1], Maria Collins[1], Payal Pradhan[1], Barbara J. Muller-Borer[2] [1]Department of Chemistry, and [2]Department of Cardiovascular Sciences, East Carolina University, Greenville, NC 27858 Background: Human mesenchymal stem cells (hMSCs), when treated with cardiogenic growth factors, have been shown to express cardiac specific genes and proteins suggesting their potential to differentiate into cardiomyocytes. In addition, preconditioning hMSCs with growth factors has been shown to improve their survival after transplantation into a cardiac microenvironment. The purpose of this investigation was to establish a role for enhanced mitochondrial content and oxidative capacity on hMSC survival and differentiation. Examining the role of mitochondria in hMSC survival and differentiation will be critical for developing more effective cell based therapies in cardiac tissue regeneration. Based on recent evidence, we hypothesized that treating hMSCs with cardiogenic growth factors would augment mitochondrial content and oxidative capacity. Human mesenchymal stem cells were treated with a cocktail of 3 growth factors: bone morphogenetic growth protein (BMP-2), fibroblast growth factor (FGF-2), and insulin-like growth factor (IGF-1). After three weeks, hMSCs were harvested, and mitochondrial physiology along with cardiac gene expression was evaluated. To determine mitochondrial function, high resolution O2 consumption experiments were conducted with various substrates through an Oroboros O2K Oxygraph system. HMSC expression of cardiac specific genes was evaluated with qRT-PCR. The oxygen consumption experiments revealed that stem cells treated with growth factors showed high levels of O2 consumption with the addition of various substrates. qRT-PCR showed increased expression of the cardiac specific genes Myocardin, Mef2C, HU-CAMTA-1, Hu-BNP, and H-Cx43 in treated hMSCs when compared to control. These findings suggest that augmentation of mitochondrial content and oxidative capacity is a necessary first step in differentiation of hMSCs, and imply that mitochondrial function may indeed be a critical component for enhancing hMSC therapies in cardiac tissue regeneration and repair.	P121
Creating Imprecise P-element excisions of Drosophila Mcm10, Hannah Cantrell, Tim Christensen, Creating Imprecise P-element excisions of Drosophila Mcm10, Hannah M. Cantrell, Tim W. Christensen, Department of Biology, East Carolina University, Greenville, NC, 27858 DNA replication is an essential process for life. This process involves a cell making a duplicate of its genetic material. Replication begins at origins where antiparallel DNA strands are unwound and polymerases synthesize the complement of each strand. This complex process involves a number of enzymes and proteins, one of which is Mini Maintenance Chromosome 10 (Mcm10). Although discovered in the same screen that revealed the Mcm2-7 helicase complex, Mcm10 has a very different role in the replication process. MCM10 has been shown to be an essential replisome factor. The highly conserved Mcm10 interacts with numerous different replication proteins and has shown to	P122

be involved in the formation of replication forks and also in the recruitment of other DNA replication proteins. In Drosophila, mutations in Mcm10 have been linked to problems in endoreplication, chromosome formation and also progression in the cell cycle. Drosophila melanogaster is used as a genetic model organism for genetic crosses, because they are homologous to humans. Also Drosophila has high reproduction rates with a short generation time, and their chromosomes are easily manipulated. A mutant allele needs to be generated in order to study the role of MCM10 in regards to its involvement in DNA replication and replication fork formation. A strain of flies with a transposable element, also called a p-element, is inserted upstream of the gene and is crossed with a strain containing a transposase. The p-element is then mobilized by the transposase. The p-element is precisely excised leaving MCM10 intact about 90% of the time. A mutant allele is obtained when part of the gene is deleted, which occurs 10% of the time. The deletion is then screened using PCR and gel electrophoresis. The mutant strain can then be analyzed using common molecular techniques to further elucidating MCM10's role in DNA replication and replication fork formation.	
Effect of PFOA on glycogen storage in an avian model, Ian Bryan, Department of Chemistry, East Carolina University, Greenville, NC 27858 As a result of their use in the manufacture of myriad commercial and industrial products, including firefighting foams, stain and water resistant coatings, and fluids used in electronics manufacturing, perfluorinated compounds (PFCs) are now part of the environmental milieu to which wildlife and humans are exposed. Studies with laboratory animal models indicate that PFCs are multisystem toxicants that induce liver, brain, reproductive, developmental, and immuno- toxicities. Of special concern are effects documented in developing organisms, including teratogenic changes and other more subtle and potentially deleterious developmental effects. We evaluated the developmental effects of a common PFC, perfluorooctanoic acid (PFOA), on chicken embryos. ²-oxidation of fatty acids is most active in the later part of incubation and glucose is derived from yolk fat. Glucose is generated from protein rather than yolk near the end of incubation and is stored in liver and muscles as glycogen. It is our hypothesis that increased ²-oxidation of fatty acids induced by developmental PFOA exposure forces the embryo to utilize protein as energy earlier in development and therefore decreases later glycogen stores, which can affect hatchability and survival. Fertile eggs were injected into the air cell prior to incubation with 0.5, 1, 2, or 5 mg PFOA/kg of egg weight and incubated. Control eggs received the vehicle (safflower oil) only. Embryos were removed from eggs after nineteen days of incubation, and immediately frozen. Glycogen was measured in prepared homogenates of each tissue. Liver glycogen levels did not differ by dose. Hatching muscle glycogen levels differed from controls by 43%, 36%, and 30% (0.5, 1, and 2 mg/kg doses, respectively). Our data indicate that PFOA decreases hatching muscle glycogen in 19-day-old embryos and there has been a marked increase in late embryo (days 18-20) death among treated groups. Additional studies are planned to evaluate glycogen stores in hatchling chickens.	P123

Expression of TLRR (lrrc67) and Protein Phosphatase-1 Isoforms as Fluorescent Fusion Proteins in Mammalian Cells, Caitlin Trumbo[1], Rong Wang[2], Ann O. Sperry[2] [1]Departments of Chemistry and [2] Anatomy and Cell Biology – Brody School of Medicine, East Carolina University, Greenville, NC TLRR or testis leucine rich repeat (also known as Irrc67) has been recently identified in our laboratory and demonstrated to be primarily expressed in the testis associated with the spermatid cytoskeleton, in particular the microtubule manchette and the centrosome. TLRR contains 4 leucine rich repeats and a protein phosphatase-1 (PP1) docking site. These leucine rich repeats likely mediate protein-protein interaction. Our previous studies have shown that TLRR and PP1 reside in the same protein complex in the testis and that TLRR interacts with the testis specific isoform of PP1, PP1³2, which is required for successful spermatogenesis. TLRR may participate in regulating the phosphorylation state of proteins near the spermatid nucleus by localizing PP1 isoforms (PP1±, PP1³1, and PP1³2) to the manchette that encircles the developing spermatid nucleus. In addition, TLRR is expressed in cultured cells and localized to the centrosome in several cell types . This is consistent with our localization of this protein at the centrosome in spermatids and suggests a role for TLRR in biogenesis of cilia and flagella. We will test our hypothesis that TLRR and PP1 interact, with co localization studies of TLRR and PP1 (PP1±, PP1³1, and PP1³2) using fluorescent fusion proteins in cultured mammalian cells. We propose that TLRR is a regulatory subunit of PP1 in developing male germ cells and localizes this enzyme to the manchette and centrosome and therefore these two proteins will associate with one another in cultured cells.	P124
Using p-element excisions to determine the role of Ctf4 in Drosophila Melanogaster, Tabitha M. Reel, Tim W. Christensen, Department of Biology, East Carolina University, Greenville, NC 27858 DNA replication is essential process for all living organisms. DNA replication begins at origins with the unwinding of the antiparallel DNA strands. The complement of each strand is synthesized via polymerases. Various complexes are associated with DNA replication to ensure high fidelity such as Replisome Progression Complex and Fork Protection Complex. A central component of those two complexes is Ctf4. Prior research has shown that Ctf4 is necessary for proper chromatid segregation and cohesion, starting from their initial establishment during S-phase to later separation in anaphase. Ctf4 is essential for viability, and depletion results in cell cycle progression defects. Drosophila melanogaster is used as a genetic model organism not only because of their high homology to humans but also the short generation times, high fecundity, and chromosome manipulation make it ideal for genetic crosses. In order to study the role of Ctf4 in regards to its involvement in DNA replication and chromatin formation, a mutant allele needed to be generated. A strain of flies with a p-element, a transposable element, inserted just upstream of the gene is crossed with a strain containing a transposase. The transposase mobilizes the p-element. About 90% of the time the p-	P125

element is precisely excised leaving the gene of interest, Ctf4, intact. The other 10% of instances, part of the gene is deleted and a mutant allele is obtained. This deletion is then confirmed using PCR and gel electrophoresis. The mutant strain can then be analyzed using common molecular techniques to answer questions about Ctf4's role in DNA replication and chromatin formation.	
Loss of TNFR1 up-regulates hepatic SIRT1 expression: possible role of micro inhibitory RNA processing factor DICER, Kylie Gearhart, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 We recently demonstrated the central innate immune cytokine tumor necrosis factor, TNF±, significantly down-regulates hepatic SIRT1, a key regulator of hepatic metabolism and circadian control. It is hypothesized that SIRT1 may be suppressed by micro-inhibitory RNAs (miRNA), specifically miR-138, which are small non-coding RNAs that control gene expression at the translational level. The specific hypothesis is that TNF± upregulates microRNA production, miR-138 in particular, by activating the RNase III-like enzyme Dicer and suppressing SIRT1. Since fasting has been shown to stimulate SIRT1 expression in the liver, Wild type mice and TNFR1-/- mice were fasted overnight. In the absence of TNF signaling in the TNFR1-/- mice, SIRT1 expression was increased whereas dicer expression and miR-138 levels were blunted compared to wildtype mice. These data highlight an important mechanism for immune regulation hepatic metabolism and possible disruption of the circadian control pathway.	P126
Motility But Not Periplasmic Flagella Is Involved In The Pathogenesis Of Lyme Disease, Tristan Boquoi, MD Motaleb, East Carolina University, Greenville, NC 27858 Borrelia burgdorferi is the causative agent of Lyme disease. The disease is the most prevalent arthropod-borne infection in the United States and Europe. It has been officially classified as an emerging infectious disease, and the number of Lyme disease cases reported to the CDC increased 300% between 1997 and 2009. The disease is transmitted to humans by the bite of Ixodes scapularis ticks infected with the spirochete B. burgdorferi. The spirochete disseminates from the site of infection to eventually inhabit a multitude of host tissues causing Lyme arthritis, cardiac anomalies, nervous system disorders etc. Deaths have also been attributed to Lyme disease. No vaccine is currently available to prevent the disease. Motility and chemotaxis are known to be required for host tissue colonization and disease production by many bacteria; however these processes have not been rigorously characterized in B. burgdorferi. The spirochete possesses 7-11 periplasmic flagella sub-terminally attached at each cell end, which reside between the outer membrane and the cell cylinder. These periplasmic flagella, encoded by flaB, are responsible for both the cells motility and wave-like morphology. Thus a flaB mutant was	P127

reported to be non-motile and rod-shaped. The flaB mutant cells were not infectious in C3H/HeN mice irrespective of the dose or route of inoculums. To determine whether motility or the periplasmic flagella is responsible for the infection in vivo, we choose to inactivate a gene that encodes flagellar motor protein, MotB. motB mutant cells were reported to retain their flagella but were paralyzed in other species of bacteria. Bacterial flagella are reported to be important immunogens and elicit adaptive immune response and thus the immunogenicity of flagellin has been the basis of variety of vaccine strategies. Here we show that a non-polar mutant constructed in B. burgdorferi motB resulted in cells that synthesize periplasmic flagella FlaB but are paralyzed. Complementation in trans corrected the defects caused by a mutation in motB indicating that the mutants phenotype is solely attributed to the mutation and not a secondary alteration elsewhere. While mouse- and tick-mouse models of Lyme disease using the motB strains are being investigated, we postulate that motility but not the periplasmic flagella is involved in the pathogenesis of Lyme disease.	
Effect of HTLV-1-encoded protein, HBZ, on CREB mediated-cellular transcription. Isabelle Nash, Nicholas Polakowski, East Carolina University, Greenville, NC 27858 HTLV-1 is a retrovirus that causes Adult T-cell leukemia (ATL), a monoclonal expansion of infected CD4+ T-cells. HBZ is a protein encoded by HTLV-1 that, unlike other viral proteins, is constitutively expressed in ATL cells. Domains currently defined in HBZ include an N-terminal activation domain, three central basic regions that function in the nuclear localization of HBZ, and a C-terminal leucine zipper (ZIP) domain that mediates dimerization with cellular bZIP factors. The cellular bZIP transcription factor, CREB, is an important target of HBZ. HBZ has been found to potentially employ two distinct mechanisms to modulate CREB activity in vitro. Firstly, HBZ dimerizes with CREB through the ZIP domain in each protein, which prevents CREB from binding to DNA. Secondly, HBZ increases the association of the cellular coactivator p300/CBP with CREB. This latter event is believed to be important for CREB to activate transcription at many cellular promoters. In this study, we investigated whether HBZ represses or activates a subset of cellular genes known to be regulated by CREB. Using cDNA prepared from T-cells expressing or not expressing HBZ, we performed a real-time PCR array to analyze expression of a panel of genes responsive to CREB. Interestingly, we found that HBZ activates and represses specific genes, confirming the dual effect of HBZ on CREB activity in vivo. Given to the fact that CREB deregulation has been shown to be linked to certain kind of cancers, the modulation of CREB activity by HBZ might be important for ATL development.	P128
J-series Prostaglandins Regulate Arachidonoyl Ethanolamide (AEA)-induced Apoptosis in Tumorigenic Keratinocytes, Christopher Crout, M. Anna Jarvis, Drisheka Thati, Allison Danell, Rukiyah Van Dross, Department of Special Studies, East Carolina University, Greenville, NC 27858	P129

Non-melanoma skin cancer (NMSC) is the most prevalent form of cancer with more than 1.25 million new cases diagnosed every year. NMSC is caused by prolonged exposure to low wavelength UV rays emitted by the sun. An important regulator of NMSC development is cyclooxygenase-2 (COX-2). COX-2 metabolizes arachidonic acid to prostaglandins (PGs) and both COX-2 and PGs are overexpressed in NMSC. Arachidonoyl ethanolamide (AEA) is a molecule which is produced in mammalian cells and interacts with G-protein-coupled cannabinoid receptors. The cannabinoid AEA induces tumor cell apoptosis however the mechanism of cytotoxicity is unclear. Our previous data showed that COX-2 is required for AEA-induced apoptosis and reports from other groups demonstrate that COX-2 metabolizes AEA to PGE2-EA, PGF2±-EA, and PGD2-EA. We hypothesize that AEA is also metabolized by COX-2 to J-series PGs and that the J-series PGs cause apoptosis. To begin to test this hypothesis, we utilized the COX-2 overexpressing cell line, JFW2. Exposure of JWF2 keratinocytes to various concentrations of AEA caused a concentration-dependent increase in apoptosis. Enzyme-linked immunosorbent assays (ELISA) revealed that AEA also induced J-series PG synthesis (PGJ2, D12,14, PGJ2, and 15-deoxy-D12,14 PGJ2) in a concentration-related manner. Next, we examined the effect of exogenous J-series PGs on the induction of apoptosis and determined that PGJ2 and 15-deoxy D12,14 PGJ2 induced apoptosis. Ongoing studies in our laboratory seek to identify the specific J-series PG(s) responsible for AEA-induced apoptosis using ultrahigh performance liquid chromatography (UPLC) coupled with electrospray ionization mass spectrometry (ESI-MS). Commercially available J-series PGs were used to develop a protocol for detection of the individual J-series PGs, some of which are isomers. UPLC-ESI-MS has been successfully used to separate and identify individual J-series PGs from standard mixtures and from our control samples. Our findings suggest that J-series PGs regulate the initiation of apoptosis induced by AEA. Further, our data indicates that the J-series PGs which regulate AEA-induced apoptosis can be identified using mass spectrometry.	
Investigating Tissue Remodeling in EphA2 Knockout Mice in Response to Ischemic Cardiovascular Injury, Jackson Vuncannon, Susan Kent,Filza Faiz, Department of Biology, East Carolina University, Greenville, NC 27858 Cardiac muscle cannot regenerate itself significantly and consequently must heal through scar formation after an infarction, leading to reduced heart function capacity and ultimately heart failure. Revascularization of the heart after infarction is critical to improving patient outcome. Our study focuses on the role of EphA2, a regulator of developmental and tumor angiogenesis. Using immunohistological staining, tissue gathered from EphA2 knockout mice has shown a 25% reduction in capillary density in uninjured hearts when compared to wild type animals and studies are underway to determine changes in vascular density in injured hearts. The inflammatory response in EphA2 knockout mice shows a 46% increase in macrophage density and a trend for increased neutrophils, indicating a more severe response to the injury. RT-PCR analysis of the EphA2 knockout mice has shown ephrin A1 and A4 ligands are reduced approximately 50%, while the EphA6 receptor increased ten-fold in heart tissue at 4 days post-myocardial infarction. Studies are underway to	P130

determine the magnitude of the change in EphA6 protein expression in WT versus EphA2 knockout mice as well as the localization of EphA6 protein to gain insight into what cell types may be influenced. This information will help us understand the potential reciprocal interactions between EphA2 and EphA6 and their role in modulating myocardial injury. Additionally, long term studies are in progress to investigate the effects of EphA2 deletion on myocyte hypertrophy, interstitial fibrosis, blood pressure, and cardiac function.	
The Effects of PFOA on TIAR vs. TDAR & PPAR-± Activity, John Creech, Jamie DeWeitt, Department of Chemistry, East Carolina University, Greenville, NC 27858 Perfluorooctanoic acid (PFOA) is an environmental pollutant and xenobiotic that has been demonstrated to be carcinogenic, developmentally toxic, bioaccumulative and to have anti-inflammatory properties through experiments in mouse models. PFOA typically reduces relative spleen and thymus size while increasing the size of the liver. The peroxisome proliferator-activated receptor- ± (PPAR-±) is activated by PFOA and regulates genes associated with glucose and lipid homeostasis, cell proliferation and cell differentiation within cells expressing the PPAR-± isotype. The thymus is a major site of T-cell proliferation and differentiation, therefore thymus protein extracts were tested for the presence of PPAR-±. PFOA inhibits the release of signaling cues from T-cells, such as interleukins, which activate B-cells to release primary antibodies (IgM) to antigens present within the blood, a process which is the T-cell dependent antibody response (TDAR). This study investigated the T-cell independent antibody response (TIAR) induced by a T-independent (TI) antigen, DNP-Ficoll, in C57Bl/6 mice exposed to PFOA. Mice were exposed to PFOA for a total of 15 days via drinking water at doses of 0, 0.94, 1.88, 3.75 and 7.5 mg PFOA/ kg body weight (BW). The relative weights of spleens from mice that received 3.75 & 7.5 mg/kg doses were reduced in comparison with control mice that received a 0 mg/kg dose. There was an observed dose-dependent exponential increase in the absolute weights of mouse livers relative to control mice. DNP-Ficoll-specific IgM titers were reduced in mice that received 1.88, 3.75 & 7.5 mg PFOA/ kg BW doses, indicating that PFOA suppressed the TIAR to TI antigens. In conclusion, suppression of the TIAR may be a more sensitive indicator of immunosuppression than the TDAR.	P131
Characterization of DNA Polymerase Delta using a combined in vivo and in vitro strategy, Lena Keller , Chad Hunter, Bonnie Bolkna, Tim Christensen, Department of Biology, East Carolina University, Greenville, NC 27858 Cancer can be caused by defects in the regulation of DNA replication. Abnormal DNA replication can lead to unregulated growth, failure to differentiate, and aberrations in chromosome biology. Numerous different proteins are involved in DNA replication and understanding the role of these proteins is essential in understanding the nature of cancer. Of these different proteins involved in DNA replication, one of the most important is DNA Polymerase Delta (´). DNA Polymerase ´ is involved in elongation of the lagging strand of DNA during the S phase of the cell cycle.	P132

Interestingly, little work has been done in multicellular organisms with regards to DNA Polymerase ´. Using two novel mutant fly strains along with cell culture, we show that mutations in DNA Polymerase ´ have effects on genome stability. The work employs a three-pronged approach consisting of an interaction analysis, a genetic analysis and a knockdown analysis in tissue culture.	
The Effects of Velocity Change on Lower Extremity Work During the Stance Phase of Running, Olivia Ratcliff, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Most positive work occurs during the propulsion phase of running while most negative work occurs during the braking phase. Individual joints of the lower extremities contribute to total positive and negative work. When running velocity is changed, there is likely a change in the amount of negative and positive work as well as a shift in the role of the individual joints. The purpose of this study is to determine the positive and negative work for the ankle, knee, and hip and their change during acceleration, deceleration or steady state running. METHODS: Three-dimensional motion analysis was performed on 5 physically active subjects running in 3 conditions: acceleration, deceleration and steady state. Kinematic data were collected with a 9-camera motion analysis system. Ground reaction force was collected with 2 force plates and these data were used to verify the conditions of speed and foot strike pattern. All subjects were rearfoot strikers. 3D joint kinematics and kinetics were calculated and joint work was derived from sagittal plane power data for the ankle, knee and hip. Total work was analyzed using a single factor ANOVA ($p = 0.05$) to determine differences between conditions for positive and negative work. Individual joint contributions to total work in each condition were also compared. RESULTS: No differences were found between speed conditions within total positive or negative work. For positive work, the ankle contributed the highest percentage (49.8%) followed by the hip (35.1%) and finally the knee (15.1%) with no difference seen between conditions. Statistically significant differences ($p < 0.05$) were observed for individual contributions to total negative work at the ankle and knee. For negative work, the ankle had the largest contribution during acceleration (58.6%) and steady state (47.5%) while the knee had the greatest contribution during deceleration (46.9%). There was no difference in negative work between conditions at the hip. DISCUSSION: Total work in the lower extremities during stance phase of running does not appear to be influenced by changes in velocity. However, individual joint contributions to negative work are influenced by acceleration or deceleration. The increase in knee work recorded for decelerating may have implications for training or injury risk in athletes.	P133

Effect Of A 16 Week Exercise Intervention On Total % Body Fat Changes In Prepubscent Children, Jordan Overbey, Jeanette Mazzawi, Katie Thomas, Bryan Creidler, Chuck Tanner, Robert Hickner, Cody Squibb, Gabriel Geyer, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Many studies of adults have concluded that increased percentage body fat (%fat) leads to cardiovascular disease, Type 2 Diabetes, certain types of cancer, and osteoarthritis. In adults it has been proven that through exercise training %fat can be decreased, thereby decreasing the risk of health related illness. A potential reduction of %fat in children through an exercise training intervention is not well established. The purpose of this study was to determine if children can decrease their %fat through a 16-week exercise intervention program. Methods: Sixty-six children, ages 8 to 11, were randomly assigned to an exercise (EX, n=44) or control (CL, n=22) group. Exercise consisted of an assortment of activities such as kickball, tennis, jump rope and other physical activities designed to keep the average heart rate above 140 beats per minute for the one hour sessions performed three days per week. The control group did not participate in the structured exercise sessions. Body composition was determined using whole body-DXA before and after 16 weeks. Results: Percent fat was reduced (-2.2±0.5%) in EX, but was increased (+0.9±0.5%) in CL (P=0.015, EX vs. CL). Conclusion: It is evident that %fat in prepubescent children can be decreased through a 16-week physical activity program in which college students lead the training/play sessions.	P134
Effect Of Exercise Intervention On Submaximal Heart Rates In Lean And Obese Prepubescent Children, Bryan Creidler, Gabriel Geyer, Cody Squibb, Chuck Tanner, Jeannette Mazzawi, Robert Hickner, Katie Thomas, Jordan Overbey, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Acute exercise tests best simulate how the body will respond physiologically to the physical exertion one might endure during the rigors of everyday life. With the overwhelming increase in America's childhood obesity rates, it is important to examine how an exercise intervention affects acute exercise performance in lean and obese children. Heart rate, in particular, is correlated to the ease of the desired task and thus will be the primary variable studied. Lean and obese subjects between the ages of 8 and 11 years old were randomly selected into two groups; Exercise (EX, N=42), and Exercise Control (EC, N=19). The EX group completed a 16-week exercise program consisting of 180 minutes of physical activity a week, keeping their average heart rates above 140 beats per minute each session. Both EX and EC groups completed an acute exercise test at the beginning (pre) and at the end (post) of the 16 weeks. The test was a 26-minute submaximal treadmill test performed at approximately 70% of the child's age predicted maximum heart rate. The workload (treadmill speed and grade) achieved during the pre test was duplicated during the post test and heart rates from the two tests were compared. Acute heart rates decreased in the EX and EC groups 9.26±1.52 BPM and	P135

0.26±1.97 BPM, respectively. The acute heart rate response was significantly more reduced in the EX group compared to the EC group (97%, P=.001). It is apparent that acute submaximal exercise heart rates at a given absolute exercise intensity are reduced over a 16-week exercise intervention when compared to a control group. This can improve performance during acute bouts of exercise, allowing for increases in duration and/or intensity during play.	
Effects Of A 16 Week Exercise Intervention On Cardiovascular Risk Factors In Obese Prepubescent Children., Katie Thomas, Jordan Overbey, Bryan Creidler, Cody Squibb, Jeanette Mazzawi, Gabe Geyer, Chuck Tunner, Bob Hickner, EFFECTS Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Obesity and related disease risk is a growing problem in both adults and children. As a result of obesity, serum triglycerides and total cholesterol are elevated and high density lipoproteins (HDL) are reduced, indicating increased risk for cardiovascular disease. The objective of this study was to determine whether a 16-week exercise intervention helps to lower serum triglycerides and cholesterol while raising HDL in obese prepubescent children, thereby lowering cardiovascular disease risk. The exercise intervention consisted of a physical activity program using activities such as kickball, tennis, basketball, and other activities providing enough stimuli to maintain the child s average heart rate above 140 beats per minute for the one hour sessions performed three days per week. Thirty-three obese prepubescent children (ages 8-11) participated in the study, 24 being placed in the exercise treatment group and 9 in the control group. A lipid profile was performed on a fasting blood draw before and after the 16-week program. The change in serum triglycerides over the 16 weeks was -9.7 ± 11.8 mg/dL, (P=.01) in the exercise group and +50 ± 25.1 mg/dL, (P=.01) in the control group. The change in total cholesterol was -4.1 ± 5.2 mg/dL in the exercise group and-2.8 ± 4.6 mg/dL in the control group. HDLs increased in the treatment group (+2.3 ± 1.6 mg/dL; P<.01) and decreased in the control group (- 5.4 ± 1.2 mg/dL; P<.01). It is evident that a 16-week exercise intervention has a positive affect on obese children's lipid profile that likely decreases cardiovascular risk in these individuals.	P136
The Correlation Between Increasing and Decreasing Temperatures and the Presence of Fleas on Animals Collected by Animal Control in Pitt County North Carolina, Sarah Raines[1], Alice L. Anderson[2] [1]Department of Environmental Health, East Carolina University, Greenville, NC, [2]Department of Health Education and Promotion, East Carolina University, Greenville, NC Fleas are a familiar pest in eastern North Carolina. Residents of eastern North Carolina often question whether or not they should treat their pets and yards, for fleas, during the winter months, because the presence of fleas dissipates. Pest experts always indicate that applying pesticides during the winter time is an effective approach for controlling fleas year around. I explored the flea	P137

population from December 2010-March 2011 in order to determine if there is a correlation between low temperatures and a decreasing flea population. I explored changes in the flea population when the temperatures dropped in 2010, and observed a resurgence in the population when the temperatures started to rise in 2011. By flea combing all of the animals at the Pitt County Animal Shelter weekly, I observed a drastic drop in the number of fleas on the animals after the first freezing temperatures were recorded in 2010. There were no fleas on the animals after freezing temperatures and snow occurred in 2010. The fleas returned the first weekend that temperatures above 70 degrees farenheit were recorded in February 2011. A review of literature shows that this is a common occurrence in flea populations. When temperatures drop below freezing, fleas become extremely inactive, and when temperatures rise above 60 deegrees farenheit, they become active again. The temperatures and weather conditions in eastern North Carolina were not typical during the time that fleas were collected. Snow and below freezing temperatures are not conditions that are typical in eastern North Carolia, even during the winter season, thus, this is an unique study. The results may effect the way that pets and yards are treated with pesticides in the future during the winter months. Preliminary results show that fleas cannot be collected when temperatures drop below freezing and can be collected when temperatures elevate above 60 degrees farenheit. I predict that the flea population will continue to grow as temperatures continue to rise, and if tempratures fall below freezing again, that the number of fleas collected will decrease.	
Comparison Of Gait Biomechanics At Self-Selected And Standardized Walking Speeds. Elizabeth Kitchens, Patrick Rider, Mike McNally, Erica Gibson, Tibor Hortobágyi, Paul DeVita, Department of Exercise and Sport Science, East Carolina University, Greenville, NC 27858 Walking is a fundamental human activity which directly affects quality of life in individuals of all ages. The Biomechanics Laboratory at ECU has conducted research on the biomechanics of walking in healthy and pathological populations to better understand how gait mechanics change with pathology and age and to ultimately improve quality of life for walking-disabled individuals. However, these tests have typically been conducted with a standardized walking speed (1.5 m/s) to eliminate the confounding variation occurring with a change in walking speed in regards to the biomechanical factors producing walking. This controlled walking speed brings into question the ecological validity of this method, indicating that the standardized walking speed may not be a true representation of walking gait mechanics compared to the subjects freely chosen or self-selected speed. The purpose of this study was to compare walking gait biomechanics in healthy young adults walking at a self-selected speed and at the standardized speed in order to investigate the biomechanical similarity or dissimilarity of self-selected and constrained walking conditions. The results of this study show there are significant differences between the self-selected walking speed and the standardized walking speed which alter gait mechanics. The mean self-selected walking velocity of 1.45 ± 0.14 m/s was significantly different than the mean standardized walking speed of 1.52 ± 0.06 m/s (p=0.03). Hip torque and work values were 1.7 (p=0.00) and 1.8 (p=0.00) times larger at the standardized speed. Knee torque was 1.4 (p=0.03) fold greater at the self-selected speed	P138

while knee work was statistically identical for both walking speeds. In addition, ankle torque was statistically identical; however, ankle power was 1.3 (p=0.01) times greater at the self-selected walking speed. These differences indicate that standard walking speed testing procedures may not be ecologically valid.	
Omega-3 fatty acid consumption in children in the Southeast, Kayce Clodfelter, Kimberly B. Heidal, Robert C. Hickner, Meagan N. Piland, Brian Schmitt, Patty Brophy, Charles J. Tanner, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 Eastern North Carolina youths have a higher incidence of overweight than the state and national average, with the incidence of overweight for 6-11 year-olds ranging on average from 20%-34% in the counties of Eastern North Carolina. The health risks often associated with obesity in adults, such as insulin resistance and abnormal plasma lipid profiles, are now being seen in young overweight children. This study surveyed children between the ages of 8-11 to determine their health risk for secondary health conditions and disease states associated with low omega-3 fatty acid intake. Eighteen subjects were recruited via fliers at local elementary schools. A validated omega-3 food frequency questionnaire containing 11 food categories was used to collect data on food consumption over the previous month. ALA, EPA, DHA and combined EPA/DHA dietary levels were assessed. Mean daily ALA consumption were low at baseline and 16 weeks (0.47 ± 0.39 mg and 0.38 ± 0.28 mg) with combined DPA and DHA levels were also low at baseline and 16 weeks (0.12 ± 0.14 mg and 0.11 ± 0.17mg). This survey provided an overview of children's dietary patterns and the possible need for nutrition education on the health benefits and good dietary sources of omega-3 fatty acids.	P139
Possible Health Impacts from Smoking and Drinking in a College Setting, Caroline Knauss, Samantha Walters, Kimberly Heidal, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 According to a study conducted at the University of Arizona, smoking is more socially acceptable in college settings where drinking is taking place (Nichter et al., 2009). The American Heart Association acknowledges Cardiovascular Disease (CVD) as the leading cause of death in the US. The World Heart Federation lists several modifiable CVD risk factors that include smoking, drinking, poor nutrition, and a sedentary lifestyle. The purpose of this study was to assess correlations between smoking and drinking among college students at East Carolina University. This study also sought to determine whether there was a relationship between the two primary factors (smoking and drinking) and two secondary factors (dietary habits and physical activity levels). A validated quantitative survey was used to assess health behaviors of college students, including smoking, drinking, eating, and physical activity. A convenience sample of 354 college students at East Carolina University was collected in the fall of 2010. About fifteen percent (14.7%) of the sample were smokers and 61.3% were drinkers. Of the sample, 11.6% were both smokers and drinkers. All smoker/drinkers while only 88.9% of nonsmoker/nondrinkers consumed fast food. More smoker/drinkers engaged in	P140

moderate and vigorous activity (92.7% and 65.9% respectively) compared to nonsmoker/nondrinkers (88.1% and 60.3%). Further research should be conducted that includes defined categories for smoking and drinking (light, moderate, heavy) to examine these behaviors for additional negative long-term health impacts.	
Effects of a High-Carbohydrate Diet on the Interleukin Levels of Older Adults, LaDonna Maddy, Scott Gordon, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 Immunosenescence involves changes on the cellular and molecular levels in the immune system, and is associated with aging. Higher incidence of autoimmune disorders and other inflammatory conditions, as well as increased rates of infectious disease, cancer, and mortality have been linked to these conditions. Proinflammatory interleukins (IL-6) have been shown to increase while anti-inflammatory interleukins (IL-4, IL-10) decrease with age. Energy restriction has been associated with altered cytokine production; thus, the purpose of this study is to examine the effects of a prescribed diet on immunosenescence in older adults. IL-6 concentrations were analyzed from venous samples of 10 older adults (46-85 yrs) and compared to 9 younger adults (18-45 yrs). Five older adults were instructed to consume a high-carbohydrate diet for three days. All other subjects were instructed to consume their normal diet. Older adults who consumed less than the Acceptable Macronutrient Distribution Range for fat (20-35% of total calories) had lower IL-6 levels comparable to younger subjects. Contrary to our hypothesis, a high-carbohydrate diet did not lower IL-6 levels; however, fat intake may contribute to a reversal of immunosenescence. Further investigation is warranted to investigate anti-inflammatory factors contributing to changes in immunosenescence. This research was supported by the East Carolina University Division of Research and Graduate Studies.	P141
Promoting Healthy Diet Tools For College Students, Lamia Nasrallah, Elizabeth Wall-Bassett,Janie Owens,Tara Smith, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 **BACKGROUND**: Since 1992, the Department of Agriculture (USDA) set forth dietary recommendations for Americans with the Food Guide Pyramid. In 2005, an updated version of the Food Guide Pyramid was released called MyPyramid. **OBJECTIVE**: This exploratory study assessed the awareness of college students at East Carolina University (ECU) regarding the new MyPyramid, and also investigated usual food intake through a voluntary survey. **METHODS**: A total of 148 respondents aged 17 to 23 were recruited from a campus Farmer s Market event at ECU. This representative sample of college students were asked twenty-three	P142

questions regarding food intake and awareness of MyPyramid recommendations provided by the USDA. **RESULTS**: Forty-five percent of students favor and are most familiar with the former Food Guide Pyramid; less than 4.90% of the sample population is accustomed with MyPryamid. One third of the respondents regularly consume home cooked meals. Of the participants who regularly consumed home cooked meals, 64% were females. Seventy-seven percent of participants have limited access to fruits and vegetables; 73% of participants have limited knowledge regarding recommended intakes of fruits and vegetables. Roughly 25% of the respondents regularly consumed pre-packaged snacks. Participants ranked taste and allergies or food aversions as the most significant factor in choosing foods. Seventy-two percent of the sample population consumes one to two healthy meals a day. **CONCLUSION**: Although, students believe that it is necessary to follow the guidelines provided by the USDA, the majority of the sample did not use or follow the guidelines recommended by the USDA. Students, however, are interested in learning more about how to meet nutrient intake goals and enhancing their food intake. Findings suggest a need for MyPyramid promotion in the higher education systems. Further research is needed to find practical ways to increase student awareness and practice of MyPyramid for improving menu planning.	
Role of Liver Circadian Rhythm in Adaptive Immunity, Laura Kashtan, Department of Nutrition and Dietetics, East Carolina University, Greenville, NC 27858 Circadian rhythms are 24-hour biological cycles that coordinate sleep-wake cycles, hormone secretion, body temperature, blood pressure, and liver metabolism. Disruption of circadian gene expression has been implicated in changes in metabolism, sleep:wakefulness, and immunity. Our study explores the role of circadian rhythm in the adaptive immune response. To address the hypothesis that circadian genes control adaptive immunity, wildtype mice were housed either in 12:12 light dark cyles (LD) or in complete darkness (DD) for 28 days to disrupt normal circadian cycles. Mice were then challenged with ConA (15mg/kg, intraperitoneal) at CT16 (16 hours post the onset of running bouts) and sacrificed 9 hours after ConA exposure. Serum ALT, innate cytokines (TNF, TGF) and T helper 1 cytokines (gINF) expression were significantly increased by ConA in wildtype mice housed in LD but blunted in mice housed in DD. However, T helper 2 (IL4, IL13) were significantly increased in DD housed mice compared to LD housed mice. Mice deficient in circadian regulator per2 were also resistant to ConA induced liver injury. These data suggest that adaptive immunity is indeed regulated by circadian control. Ongoing experiments will address the precise role of circadian genes such as per2 in the regulation of adaptive immune cells. This work was supported by NIAAA 1R15AA019559.	P143

SEXTING: Sexual Content/Images in Romantic Relationships, Makeda Parker, Department of Sociology, East Carolina University, Greenville, NC 27858 Personal, portable, wirelessly networked technologies have become commonplace in the lives of undergraduates in romantic relationships. These devices are used to advance and maintain love relationships including the transmission of erotic content. This study reports the analysis of data provided by 483 undergraduates who completed a 25 item Internet survey designed to assess the degree to which technology is being used to send sexual messages, photos and videos to a romantic partner (primarily via a cell phone). Almost two thirds (64%) of the respondents reported sending a sexual text message, over forty percent (42.9%) a sexual photo and over ten percent (12.7%) a sex video. Regression analysis revealed that men were more likely to initiate sending sexual content but no significant differences in both genders for ever having done so. Males were also more likely to perceive sending sexual content to have a positive relationship effect (but no actual positive relationship effect was observed). Implications and limitations of the study are suggested.	P144
The influence of religion on young adult's attitudes of dating events. Sarah Miller, Alan Taylor, Damon Rappleyea, Department of Child Development and Family Relationships, East Carolina University, Greenville, NC 27858 Emerging adulthood is characterized as a time of identity exploration often marked by instability and uncertainty. Multiple research studies have demonstrated that religion provides an important source of identification and support for young adults. Our study was distributed to young adults via email and Facebook and included measurements of dating behaviors, technology use, personality, intimacy, and attachment. Participants were asked to respond to questions regarding their level of participation in religious activities, fraternities, sports, the fine arts, and school clubs/organizations. Utilizing social identity theory, this study examined the influence of religion on young adult's attitudes about dating events. More specifically, 1,289 young adults between the ages of 18-30 were asked to identify their level of religiosity and religious attendance, as well as those events that they believed to be acceptable to engage in prior to initiating a dating relationship. Of this sample, 472 participants identified themselves as being active within their religion. Dating events included non-risky behaviors such as regularly hanging out or texting, and risky behaviors such as sexual intercourse or sexual (non-intercourse) experiences. Using logistic regression analysis, there were found to be significant differences among those young adults who indicated that they were active within their religion compared to those who were not. Through our preliminary analysis, we found that religious activity was a strong predictor of young adult's attitudes of dating behaviors. There were also significant differences among responses regarding kissing/hand holding behaviors, "sexting," sexual intercourse and non-intercourse sexual activities, and family approval of relationship. No significant differences were found in hanging out, texting and emailing, expression of mutual/intimate feelings, making the relationship "Facebook official," and cohabiting. There were significant differences found	P145

among male and female participant's views of these dating behaviors.	
Maternal Sleep and Fatigue: Are They Associated with Maternal Verbal Limit Setting? Sarah Bradley, Department of Communic Science and Disorders, East Carolina University, Greenville, NC 27858 The purpose of this research was to understand how maternal sleep and fatigue influenced maternal verbal limit setting. The participants were 33 mothers and their toddlers. The Patience Task, a task designed to be mildly stressful for both mothers and their toddler-aged child, required that the mother prevent her toddler from touching a desirable toy for 8 minutes while the mother was completing a 3-page distraction survey. Maternal limit setting was coded into six categories. Positive verbal limit setting included the mother (1) politely requesting that child perform or stop performing a behavior (polite do); (2) trying to change/stop child's behavior without specifically requesting it (hint do); (3) praising child for a behavior to continue (positive evaluation); (4) requesting child complete a behavior in exchange for something (bargaining); and (5) sympathizing with child to show understanding of child's feelings (empathy). Negative verbal limit setting was coded as the mother chastising child for not following directions (negative evaluation). It was hypothesized that mothers with more sleep problems and more fatigue would be less likely to use positive verbal limit setting techniques, such as polite do, hint do, and empathy, and that they would be more likely to use the negative limit setting strategy. Using correlation, we found that mothers' poor quality of sleep was associated with fewer instances of positive verbal limit setting, specifically in the categories of polite do ($r = -.31$, $p = .07$), hint do ($r = -.36$, $p = .06$), and bargaining ($r = -.35$, $p = .04$). Mothers who were more fatigued used more negative evaluation ($r = .35$, $p = .05$). Further, more fatigued mothers used less positive verbal limit setting, specifically fewer polite dos ($r = .35$, $p = .05$), hint dos ($r = -.40$, $p = .02$), positive evaluation ($r = -.33$, $p = .06$), and empathy ($r = -.31$, $p = .09$). Our findings supported our expectation that maternal sleep and fatigue would influence the valence of maternal verbal limit setting.	P146
The use of technology in dating relationships during emerging adulthood, Ember McKown, Sarah Miller, Heather Carnahan, Alexis Garcia, Miriam Dari, Alane Collinson, Vue Vu, Department of Child Development and Family Relationships, East Carolina University, Greenville, NC 27858 During emerging adulthood, individuals are often beginning to develop a sense of self, while also building close, intimate relationships with others. On college campuses throughout the country, young adults have increasingly begun using technology devices (cell phones, e-mail and internet social sites/Facebook, IM) to initiate, build and maintain these intimate relationships. However, little research has examined how dating couples specifically use technology in their daily communication practice and which devices are most useful for certain types of partner communication topics/discussions. A survey was distributed through an email and Facebook announcement to all East Carolina University students asking them questions about their dating behaviors/attitudes,	P147

technology use, usefulness and misuse of technology within couple relationships, personality, intimacy level, and attachment style. Individuals were specifically asked which technology devices they use most regularly while communicating to a current or past dating partner, what times of day were they most likely to use these devices, and what devices are most helpful when discussing couple-related topics. Of the 1289 individuals completing the survey, 741 young adults indicated they were currently in an intimate, dating relationship. Through our preliminary analysis, we found that young adults most often used cell phone-texting in their daily communication within their partners, followed in order by cell phone -talking, e-mail, Facebook/other social network sites, IM and dating sites. Nearly 75% of dating partners communicated with their partners starting at 11:00am and consistently communicated with them until 11:00pm. The time of day where couples used technology the most to communicate with their partners was 8:00pm to 11:00pm. Finally, dating partners indicated that it was detrimental to use cell phone-texting, cell phone talking, and Facebook when confronting their partner displeasure and discussing a controversial issue or breaking up. It was found that these same technological devices were found to be helpful for dating partners when expressing love and joy, making plans, and requesting something. Further analysis will examine differences among males and females in their use of technology within their dating relationships.	
Testing the Effectiveness of Mindfulness Meditation, Heather May, Alexandria Caple, Brooke Kemp, Taylor Rush, Benjamin Aydelette, Christyn Dolbier, Department of Psychology, East Carolina University, Greenville, NC 27858 Background: Stress occurs when environmental demands outweigh available resources to cope with those demands, which can have negative physiological and psychological effects. One way to alleviate these effects is mindfulness meditation (MM), a state of active awareness of one's present thoughts and emotions without judgment. Research shows that MM increases positive states of mind and decreases emotional distress and deleterious physiological activity, but little examines its effects on beneficial physiological activity such as high heart rate variability (HRV). HRV refers to fluctuations in intervals between consecutive heartbeats, with greater fluctuations reflecting parasympathetic nervous system (PNS) calming activity, and smaller fluctuations reflecting sympathetic nervous system (SNS) arousal activity. In addition, research has focused on a multi-component MM program, with little examining the effects of different MM techniques. Purpose: The purpose of this study is to examine the effects of the sitting MM technique on psychological and physiological functioning. Methods: The sample included 106 students, the majority of whom were female (64%), Caucasian (69%), and freshmen (76%), with an average age of 19 years. Participants were randomly assigned to one of two 20-minute conditions: experimental (instructional CD led sitting MM), or control (sitting quietly). Participants completed questionnaires (perceived stress, high arousal positive and negative emotions, physical and mental relaxation) and blood pressure and HRV were assessed pre- and post-condition. Results: Analysis of covariance found that after controlling for pre-condition levels the MM group had significantly: 1) higher positive emotion ($F=14.03$, $p<.001$), 2) higher mental relaxation ($F=6.66$, $p=.011$), 3) higher low frequency norm ($F=4.71$, $p=.03$) reflecting greater SNS activity; and 4) lower high frequency norm ($F=6.4$, $p=.01$) reflecting lower	P148

PNS activity post-condition than the control group. Conclusion: Sitting MM demonstrated beneficial psychological effects and greater physiological arousal. The high arousal positive emotions experienced by the MM group may account for their greater physiological arousal. These findings are consistent with previous research highlighting the complexity of MM, and how it can enhance active awareness while concurrently facilitating mental relaxation.	
ICD Shock Reduces Perceived Sense of Security in Patients with an Implantable Cardioverter Defibrillators: **A US National Survey**, Justin Smith[1], Jessica Hauf[1], Katherine Cutitta[1], Kevin Woodrow[1], Ashley Walson[1], Kari Kirian[1], Garrett Hazelton[1], Avi Fischer[2], Julie Shea[3], Samuel F. Sears[1] [1]Department of Psychology, East Carolina University, Greenville, NC [2]Cardiac Arrhythmia Service, Mount Sinai School of Medicine, New York, NY [3]Cardiac Arrhythmia Service, Brigham and Women's Hospital, Boston, MA Introduction: Implantable cardioverter defibrillators (ICD) terminate potentially life-threatening arrhythmias with high energy shocks in at risk patients. Previous research has suggested that most ICD patients feel a greater sense of security about their overall health after ICD implantation. Following ICD shocks, many patients experience psychological distress, but the effect of ICD shock on patients' perceived sense of security is unknown. Methods: ICD patients (N=419) were assessed through a national online survey in regards to their experiences with ICD implantation. Frequencies and Crosstabs were preformed on the data to describe the sample. A Univariate Analysis of Variance test was performed to determine if there was a difference between the number of shocks an ICD patient experienced and their sense of security. Pairwise comparisons were conducted to determine if number of shocks were a significant predictor of less secure ICD patients. Results: Descriptive analysis indicated that 73.4% of ICD patients reported having a stronger sense of security concerning their overall health after having the ICD implanted. However, the number of shocks that ICD patients experienced significantly affected their sense of security, $F(2, 442) = 6.65$, MSE = 2.399, $p = .001$, $\eta^2 = .02$. Pairwise comparisons were made with Bonferroni corrections. Patients who had greater than five shocks had significantly lower levels of security than those with four or fewer shocks ($p = .018$) or no shocks ($p = .001$). Conclusion: The majority of ICD patients in the sample (73.4%) reported a stronger sense of health security following ICD implantation. However, if an ICD patient experiences five or more shocks, their sense of security decreases. Results elicit a need for clinicians to acknowledge that, along with other psychological distress, patients experiencing more than five shocks will likely have reduced sense of security. The importance of sense of security in overall disease management warrants further examination in future research.	P149

"An investigation on the generalizability of the relationship between extraversion, social support, and health", Kelsey Ruffing, Jaleesa McMillan, Department of Psychology, East Carolina University, Greenville, NC 27858 The effect of personality on sociability and health is a widely theorized subject. Many studies have demonstrated the positive effects that sociability and social support can have on health (Cohen, Doyle, Turner, Alper, & Skoner, 2003; Cohen, 2004). Based on the results of these studies, we believe that extraversion might also be a strong indicator of social support, life satisfaction, and health. Many studies in this area have used participants from U.S. college samples. We contribute to the literature by investigating the generalizability of the relationships between personality and health to Swedish adult participants. We hypothesized that individuals high in extraversion would report more social support and life satisfaction and, as a result, would report high levels of physical and mental health. Longitudinal data from the Swedish Adoption/Twin Study on Aging (SATSA) were analyzed (Pedersen, 2005). Correlational analyses were conducted on extraversion, social support, life satisfaction, mental health, and physical health. The results of these analyses provide support for the positive relationship between extraversion and social support. Specifically, the relationship between extraversion and friends' support was positive and moderate ($r = .350$, $p = .00$). The relationship between extraversion and relative's support was also positive and statistically significant ($r = .168$, $p = .00$). Interestingly, the relationship between extraversion and perceived social support was weaker than that of friends' and relatives' support ($r = .085$, $p = .003$). As anticipated, extraversion was negatively related to mental health measures including depression ($r = -.445$, $p = .000$) and state anxiety ($r = -.307$, $p = .000$), as well as physical health measures including self-reported illnesses ($r = -.085$, $p = .001$). The negative relationship increased anxiety and depression in those that are low in extraversion might be a result of decreased social interactions with others. The results of this study support the idea that personality, and extraversion in particular, affects the health and sociability of individuals in a way that impacts their overall well-being. In addition, our findings support that these relationships exist in adult populations outside of the United States.	P150
The effects of sociability and neuroticism on personal health. Darryl Wright, Department of Psychology, East Carolina University, Greenville, NC 27858 Previous research has found that neuroticism has a negative effect on health, while social support positively affects health. In an effort to contribute to the current literature and examine the relationship between neuroticism and sociability, the current study is analyzing the interaction of neuroticism and sociability on health. The current study used data from the Swedish Twin Adoption Study of Aging (SATSA), 1984, which began in an effort to longitudinally measure both environment and developmental factors human beings experience through life. The SATSA study analyzed the development of the participants by administering various questionnaires evaluating subjects on many different levels such as smoking habits, personality traits, and chronic sickness/disease. The strength of this study comes from the large amount of subjects, which is	P151

estimated at roughly 2,000 twins. An analysis of variance was used to test the significance of sociability and neuroticism. The results displayed a main effect for neuroticism F (1, 1468) = 77.73, p < .001, as well as sociability F (1, 1468) = 15.63, p < .001. There was no significant interaction between sociability and neuroticism F (1,1468) = .01, p = .918. Specifically, individuals who were more neurotic had poorer health, and individuals who were less neurotic had better health comparatively. One reason we did not find a significant interaction between sociability and neuroticism is due to the fact that an individual can be both social and neurotic.	
Female Masturbation: Attitude Change Via Lecture Vs. DVD (Personal Discussion), Amanda Lee, Megan Keels, David Knox,Ken Wilson, Department of Sociology, East Carolina University, Greenville, NC 27858 Almost 500 (498) female undergraduate students at a large southeastern university participated in a study to assess how lecture versus DVD format affected attitude change toward female masturbation. All groups were given a pre and post test to assess masturbatory attitudes. Group 1 experienced a masturbation lecture. Group 2 experienced a six minute DVD (digital video disc) of an undergraduate female discussing her own masturbatory history and experiences including a discussion of the vibrators she uses. Comparison of the data revealed positive increases in attitudes toward masturbation from pre to post test independent of lecture or DVD exposure (with greater change occurring in the lecture format).	P152
Older Lesbians Dealing With The Loss Of A Partner, Amanda Edmundson, Department of Psychology, East Carolina University, Greenville, NC 27858 Older lesbians experience bereavement differently from the typical heterosexual person. Not only are they dealing with the loss of a loved one, older lesbians are forced to fight battles from all sides. In a national online survey, 456 older lesbians responded to a number of questions regarding end of life care, discrimination, social activity, relationships, and socio-demographics. Of this sample, 13.5 % (n= 55) women stated that they had experienced the death of a partner while they were together. The following were identified as major obstacles in dealing with the death: emotional (76%), legal (41%), social (41%), and financial (36%). Descriptive comments about these experiences identified several themes, including experiencing disrespect from the partner s family, healthcare providers, the community, their work place, and those providing funeral services, facing legal battles to keep their estates and finances intact, and feeling isolated from other lesbians whose partners are still living.	P153
The Effects Of Teasing In Obese Adolescents As It Contributes To Stigma And Potential Impact On Subsequent Weight Loss Attempts, Dustin Burrell, Emily Steinbaugh, Marissa Errickson, David Collier, Leslie Lutes, Department of Psychology, East Carolina University, Greenville, NC 27858	P154

Obesity related stigma is associated with numerous adverse effects on global self-esteem. Higher levels of teasing are associated with obesity across all races and ethnicities. However, within the African American (AA) culture, where the conception of beauty and ideal weight includes a higher weight status than in other US cultures, weight-related teasing may not have as great of an impact as does weight-related teasing in cultures where underweight is idealized. A few studies have addressed obesity stigma in AA adolescents, yet none have examined its effects related to weight loss. The present study seeks to examine the relationship between teasing history, self esteem, and weight loss among mostly AA obese adolescents attending a 3-week summer residential weight camp in eastern North Carolina. Objective physical assessments and self-report questionnaires were completed by the participants at baseline and post camp. Participants were administered the Physical Appearance Teasing Scale (PARTS) inventory to measure teasing and the Rosenberg Self-Esteem Scale (SES) along with other psychosocial questionnaires. The teasing inventory measured both weight-related teasing and other appearance-related teasing. Nineteen obese (Initial BMI M =39.45, SD =9.99) male (n=4) and female (n=15) campers, ages 12-18 (M =13.84, SD =1.57) participated in a residential camp in eastern North Carolina. Campers reported high total PARTS scores (M = 34.57, SD = 13.53) and weight-related teasing scores (M =24.4, SD =9.55). There was a marginally significant correlation between weight-related teasing and self-esteem score (r = .435, p = .063), suggesting that a history of weight-related teasing may be related to lower self-esteem. Multiple regression analysis assessed whether weight-related teasing and self-esteem scores predicted participants' weight loss attempts. The results were not significant. These results may have implications for developing effective and culturally sensitive treatment plans for AA adolescents. Because neither weight-related teasing nor self-esteem predicted weight loss, more emphasis may be placed on other factors contributing to obesity in this population. Limitations to this study include small sample size, short program length, small composite weight loss, and a lack of a comparison group.	
Exploring The Microbial Diversity Of Alkaline Carbonate Biofilms Of Newfoundland, Canada And Ligurian Springs Of Italy, Brigid O'Boyle, Bridget Nelson, William Brazelton, Matt Schrenk , Department of Biology, East Carolina University, Greenville, NC 27858 Over the past 4 billion years, microbial life has evolved adaptations to succeed in numerous, diverse ecological niches at and below the Earth's surface. The high pH, highly reducing conditions created by the aqueous alteration of ultramafic rocks (serpentinization), characteristic of the Earth's mantle, represents a unique environment at one end of this continuum. Serpentinization also generates substantial quantities of hydrogen and methane, which can serve as fuels to support microbial growth. When serpentinite seep fluids reach the surface and mix with atmosphere, they initiate the formation of extensive travertine (calcium carbonate) deposits, which can host microbial communities within its pore spaces. This study examines the microbial diversity of carbonate-hosted habitat from serpentinite seep environments in Newfoundland, Canada and in the Ligurian Springs of Italy. Total genomic DNA was extracted from the rock-hosted microbial populations and quantified through fluorometric analysis. Subsequently, fluorescently-labeled primers specific for the two prokaryotic	P156

domains, Bacteria and Archaea, were used to PCR amplify the 16S ribosomal RNA gene in the template materials and conduct terminal restriction fragment length polymorphism (T-RFLP) analyses. T-RFLP "fingerprints" can be used to compare species richness and diversity within the carbonate samples and determine their similarity to one another and to the seep fluids. Initial data has shown between 20 and 49 ng/g of carbonate material extracted and indicated the presence of Bacteria in at least some of the samples analyzed. Ongoing work is generating the T-RFLP data from the extracted template DNA. In addition to better understanding the microbial ecology of serpentinite seep environments, this research also impacts to the efforts toward reducing global warming. One of the main causes of global warming is the excess of CO2 in the atmosphere; one of the proposed plans to slow-down the effects of global warming is to pump excess CO2 into rocks that will form carbonates. Another aspect that this research can be applied is to the field of alternative energy, as copious quantities of methane and potentially other hydrocarbons are generated abiogenically through serpentinization. In both cases, it is critical to understand the interaction of microbial communities with these carbon and energy pools. This work will provided critical baseline data to define endemic serpentinite microbial communities.	
Dorsal Pad Structure and Function in a Parasitic Copepod, Aaron Wallace, Department of Biology, East Carolina University, Greenville, NC 27858 The purpose of this research was to document the morphology of a newly discovered and previously undescribed species of copepod. This parasitic copepod was discovered internally within Dasybranchus polychaetes collected from the Gulf of Mexico. Videographic imagery and scanning electron microscopy (SEM) examinations revealed the physical structure of the copepod, including five pairs of dorsal thoracic wing-shaped pads (the fifth pair of pads are modified legs) which are especially prominent on the much larger mature female. Videographic images revealed these structures are not important in the locomotion of the organism. Further SEM examination at very high magnification (20,000 to 50,000x) revealed the presence of numerous surface micropores on the thoracic pads. SEM imagery revealed debris within the pores, which suggested a possible secretory or osmoregulatory function. A sensory function might also be possible. Ongoing research to determine the function of the pores is currently being conducted with transmission electron microscopy. Initial TEM imagery revealed the presence of membrane structures and mitochondria, which might suggest a possible secretory function of the pores. The continuing research is focused on obtaining additional data at the cellular level to reveal the function of the micropores, which will complete the description of the undescribed organism and create a better understanding of the biological function of this extreme parasitic species.	P157

Infrared Spectroscopy for Archeological Artifact Identification, Brianna Biscardi, Department of Chemistry, East Carolina University, Greenville, NC 27858 Proper identification of archaeological artifacts is critical if the objects are to be studied or displayed. Objects manufactured from keratin based materials are particularly difficult to classify. These artifacts can be manufactured from animal horn, tortoiseshell or hair. Visually it is almost impossible to correctly identify the exact material. Spectroscopy can prove a useful tool in this regard however these materials are so spectrally similar one cannot visually detect obvious spectral changes. Our study utilizes chemometrics to discriminate and classify keratin based materials from their infrared spectrum. Initial results are presented.	P158
CD Spectroscopy, Matthew Stump, Department of Physics, East Carolina University, Greenville, NC 27858 CD spectroscopy measures the difference between the measured left and right polarized light. This technique is useful in determining the composition of samples, especially biological samples. After obtaining a filter of known spectral features, scans with different bandwidths were performed on a UV-Vis spectrometer and a CD spectrometer. The CD spectrometer scans were then deconvolved (using Mathematica) with the filter spectrum in order to characterize the spectral behavior of the CD spectrometer itself. Having this information will be useful in future CD spectroscopy experiments.	P159
Progress towards mapping indeterminate floral apex1, a gene required for maize inflorescence development, George Vuong, Department of Biology, East Carolina University, Greenville, NC 27858 Maize is an important crop plant. One of the inflorescences in maize, the ear, contains kernels which are a highly used food source. In the Thompson lab, we utilize mutant strains in order to determine the function of genes during inflorescence development. An important recessive mutant in maize, indeterminate floral apex1 (ifa1), affects inflorescence development. The long-term goal of my research project is to identify the gene responsible for the ifa1 mutant phenotype. ifa1 has previously been mapped to chromosome one within 3 cM of umc76 However, more efficient mapping techniques have been developed since the original mapping attempts. I am using a map-based cloning approach to identify the ifa1 gene. Prior to joining the lab, an ifa1 mapping population was generated by crossing ifa1 homozygotes to the A632 inbred and selfing the resulting progeny. I collected leaf tissue and isolated DNA from individual mutant plants in this mapping population. Then I tested specific loci for linkage using PCR-based markers, which take advantage of size polymorphisms in different maize inbreds. I have identified flanking markers using recombinant chromosomes. So far I have narrowed down the ifa1 containing interval to a region spanning 8 cM between markers	P160

umc1222 and umc1408. Currently, I am looking for new markers and recombinants to further narrow down the region.	
Spatial correlates of nest box placement for optimizing reproductive success in Eastern bluebirds, Claire Perry, Kimberly P. Wade, Charles E. Williams, William F. Davis, Dunya M. Safa, Department of Biology, East Carolina University, Greenville, NC 27858 Spatial variables can influence colonization patterns of nest boxes by Eastern bluebird Sialia sialis. We expect proximity to buildings to negatively influence colonization due to human disturbance. Competition for food and reproductive interference should select for intraspecific avoidance. Bluebirds prefer to forage in open habitat, so we expect bluebirds to prefer boxes away from the forest s edge. In the spring of 2010, twenty-six nest boxes were erected on West Research Campus. Beginning the second week of March, the nest boxes were examined for nesting material, eggs, hatchlings and fledging. The data were collected twice a week from March through June, then once a week in July. Reproductive success was summarized at the end of the season. Twenty boxes (77%) had nesting attempts. Four had two nesting attempts. The distance between each nest box and the closest building, nearest forest edge and its nearest neighbor was calculated using Google Earth. Pairs that laid eggs earlier in the season produced significantly more fledged young. Linear regression analysis revealed that nest boxes farther from their nearest neighbor had significantly better fledging success. There was a trend for those farther away from buildings to produce more young. There was no significant effect of proximity to forest edge. These data will be used to guide optimal nest box placement in this year's study.	P161
Determining the presence of lanolin from ancient bathtub samples obtained in Cyprus and Israel. Kimberly Tillapaugh, Department of Biology, East Carolina University, Greenville, NC 27858 Several samples from ancient bathtubs obtained in Cyprus and Israel are currently being analyzed for the possible presence of lanolin or a stable derivative of lanolin. Infrared attenuated total reflectance spectroscopy and gas chromatography coupled to mass spectrometry have been used to analyze the samples. Preliminary data is presented.	P162
Assessing Long Term Trends of Groundwater Levels in the Surficial Aquifer of North Carolina, Jessica Kegel, Alex Manda, Department of Geological Sciences, East Carolina University, Greenville, NC 27858 Groundwater is an undeniably important source of potable water for communities in many parts of North Carolina. Unfortunately, few studies have comprehensively assessed how groundwater levels	P163

vary in the state. This study assesses both the sequential and spatial variations of the shallow groundwater system as well as its association to precipitation in North Carolina. This study documents changes in the hydrologic cycle s subsurface component of the surficial aquifer over regional and decadal scales within the last thirty years. Time series analyses are used in order to investigate the response of the groundwater system to precipitation. Groundwater level precipitation data are obtained from the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Resources and the United States Geological Survey (USGS). Normalized anomalies are used to assess groundwater trends with respect to precipitation in an attempt to determine any important trends and evaluate any associations between groundwater levels and precipitation. The preliminary data indicates that although trends of groundwater levels do vary spatially, precipitation does appear to have an influence on groundwater levels in the surficial aquifer. The importance of this study is that the results could be useful in assessing the impact of climate change and variability on North Carolina's groundwater resources.	
The Optimization of the Organic Synthesis of the Indanone Precursor to Indatraline, Meagan Decker, Department of Chemistry, East Carolina University, Greenville, NC 27858 Indatraline's action as a neural transporter inhibiter makes it a compound of particular interest in the pharmaceutical industry. By increasing the efficiency of the synthesis of its indanone precursor, the overall synthesis of indatraline can be greatly facilitated. The optimization of the synthesis of the target indanone will demonstrate the power of the rhodium-catalyzed cyclization of ortho-formylbenzaldehyde derivatives in the rapid synthesis of related indanones and indanamines. The target indanone has previously been synthesized in an eight-step procedure with a 45% overall yield. Beginning from the commercially available 3,4-dichlorophenyl-acetylene, a new synthetic pathway of only three steps has been introduced. The critical step in this new synthetic pathway is the chiral hydroacylation of a substituted vinyl benzaldehyde catalyzed by a cationic rhodium (R)-BINAP complex. The purity of the intermediates has been determined by mass spectrometry and NMR, while enantiomeric excess was determined by HPLC analysis. The procedure has been modified appropriately to improve the yield and enantiomeric excess. Once the synthesis has been optimized, related compounds can be synthesized efficiently and the production of new pharmaceuticals will be facilitated.	P164
Variation in Dentition of Threespine Stickleback, Terra McSwain, Department of Biology, East Carolina University, Greenville, NC 27858 The wide distribution of stream and anadromous threespine sticklebacks (Gasterosteus aculeatus) provides an opportunity for replicated tests of adaptive ecological divergence in response to the invasion of new habitats. In the Little Campbell River (British Columbia), an anadromous and a freshwater population are adjacent with little contact. The freshwater population harbors an unusual	P165

color polymorphism, i.e. some females exhibit male-like red throat coloration. We tested whether this polymorphism is associated with ecological divergence in feeding preferences by examining jaw and tooth morphology in red and dull females and comparing them to the ecologically diverged color monomorphic anadromous population.In particular, we characterized the morphology of individual teeth and their placement on the premaxilla and dentary using scanning electron microscopy. We observed large differences in tooth arrangement as well as variations in tooth morphology between the stream and anadromous stickleback abutting populations. We did not find divergence in tooth organization and morphology between color morphs in the freshwater population. We discuss our results in the context of the maintenance of color polymorphisms and the adaptive ecological radiation of threespine stickleback.	
Phenotypic correlates of female color polymorphism in a California stickleback population, Samantha Mears, Department of Biology, East Carolina University, Greenville, NC 27858 Commonly, male animals exhibit ornamentation that females may prefer when selecting a mate. This is well documented in populations of the threespine stickleback fish in which females often prefer red male throats. The McKinnon laboratory has discovered that female sticklebacks in British Columbia and in Matadero Creek, California also exhibit red throats. I am investigating male mate preference and potential correlations between female color and other traits, including those that may indicate female quality. This study is being performed with wild-caught Matadero fish now in the laboratory. I am analyzing spectrophotometry data collected from wild caught Matadero fish, and I am assessing correlations between throat color and size, and the relationship to fecundity. Correlations between throat and eye color (males have blue eyes) are also being examined, to assess the possibility that some females are generally masculinized. I am assessing the color of the throats, spines, and eyes using quantitative analyses of digital photographs and reflectance spectrophotometric analyses of some characters. I am also beginning preference tests in which males are presented with a series of females varying in throat color and other traits. This study will complement and extend research being conducted in our lab with British Columbia sticklebacks. By examining an array of female traits and male preferences, the complexity of sexual selection on female ornaments can be assessed, in contrast to most studies which look only at males or at a single female trait.	P166
Effects of Biofuel Production Practices on Abundance and Diversity of Herpetofauna, Zachary Aardweg[1], Jessica Homyack[2], David Chalcraft[1] [1]Department of Biology, East Carolina University, Greenville, NC, [2]Weyerhaeuser NR Company In the United States there is a growing desire to produce more liquid fuels created from plant based sources like switchgrass (*Panicum virgatum*) or residual woody biomass. There are concerns about the sustainability of the production of biofuels and the possible effects on wildlife habitat and biodiversity. Few studies have examined how managing landscapes for the production of biofuels	P167

affects wildlife. We compared traditional intensive pine management and four biofuels management practices on abundance and diversity of herpetiles on 0.8 ha study plots in a randomized and replicated experiment in eastern North Carolina. The area was divided into four blocks that each contained a replicate of all treatments tested. The treatments compared a single harvest of woody debris left after clearcutting and/or planting switchgrass as a biofuels crop either between the rows of pine or exclusively. PVC treefrog tubes and pitfall traps were set up along a drift fence array in the center of each treatment plot and monitored for at least three days a week from mid April to mid July 2010. A total of 266 herpetiles were captured from 11 species. The majority of the captures were toads (Bufo spp.). Significant spatial variation in diversity and abundances of amphibians was found. Even though the habitat differed greatly among biofuels treatments did not differ in species richness or relative abundance of the herpetiles found. The hot and dry weather experienced during the summer months of 2010 may have limited amphibian movements and decreased captures.	
Deciphering migration and gene flow patterns from historic and extant population fragmentation effects in an endemic California spider *Aphonopelma reversum*, Xavier Atkinson, Chris Hamilton, Jason Bond, Department of Biology, East Carolina University, Greenville, NC 27858 With 90 recognized species throughout its range and 54 residing in the United States, Aphonopelma comprises the most speciose tarantula genus on Earth. An understanding of this biodiversity and the pattern and process behind it is critical to understanding how future biodiversity will be affected by climate change and human disturbance. We used inferences of phylogenetic relationships and multiple species delimitation techniques, for a group of Aphonopelma tarantula lineages in the reversum species complex, to identify historical events that shaped the evolutionary history of these North American coastal endemic spiders. After sampling 23 populations in southern California, we utilized a set of mitochondrial DNA markers that include the animal ”barcoding gene” (CO1) (Hebert 2003a & b) to determine the fragmentation effects on the population structure, dispersal patterns and gene flow that played a role in shaping the present-day diversity and distribution. Our data suggests the population fragmentation we see today is a consequence of climate change during the Pleistocene, as well as human perturbation of habitat in highly urbanized southern California. Identifying the processes of evolutionary diversification through accurate taxonomy, phylogenetic reconstruction, and investigations of population-species interactions help bring to light threatened or endangered populations in order to help conserve evolutionary diversity.	P168

Fitness Components of Color Pattern Variation in a Female Polymorphic Stickleback Population, Kevin Shah, Department of Chemistry, East Carolina University, Greenville, NC 27858 The three-spine stickleback has now become a model system in sexual selection and evolutionary ecology. During the reproductive season, males have a characteristic red throat that is used in male-male contests and is the target of female choice. The McKinnon laboratory has discovered populations in British Columbia and California that harbor a rare color polymorphism wherein some females exhibit red throat coloration, a typically male trait. In order to explore the forces maintaining such polymorphism, we studied critical life history parameters in a wild-caught laboratory maintained population and tested whether red- and dull-throated females differ in fecundity, condition, clutch size, mean egg size and weight, growth rates, inter-clutch interval and number of clutches. We find no evidence of divergence in the traits examined and we discuss these results in the context of polymorphism maintenance and adaptation.	P169
The Territorialism and "Social Networks of Dusky Damselfish and Yellowtail Damselfish, Jessica Pendergrass, Department of Biology, East Carolina University, Greenville, NC 27858 Dusky damselfish (*Stegastes adustus*), and yellowtail damselfish (*Microspathodon chrysurus*) are species that are commonly seen along the coral reefs in San Blas, Panama. Feeding areas of adults of the largest damselfish species, Microspathodon chrysurus, are superimposed on feeding areas of adults and juveniles of the Stegastes adustus. The large species aggressively dominates its smaller interspecific cohabitants. Cohabitant individuals of each species eat the same types of benthic microalgae. M. chrysurus has the same daily cycle of feeding activity as S. adustus, uses the same feeding microhabitats as they do, and feeds almost exclusively in their feeding areas. Cohabitants defend their feeding areas against the same set of other herbivorous fishes, but M. chrysurus is involved in defensive actions much less frequently than is S. adustus. Thus adults of M. chrysurus appear to be dependents that use their size-based dominance ability to obtain food from their cohabitants (Robertson). The project hypothesized that both dusky damselfish and yellowtail damselfish protect the same resources from the same herbivores, and that both species have a similar "social network" make-up. The fish's "social network" was defined as all the species of fish observed in the direct area with the damselfish while observation was taking place. It was discovered that both dusky damselfish and yellowtail damselfish protect the same resources from the same herbivores, but that both species do not have a similar "social network" make-up.	P170

Determining the Biodiversity and Microbial Load Associated with Restoration of the Queen Anne's Revenge Shipwreck, Shanley Church, Matthew Schrenk, Shanna Daniel, Department of Chemistry, East Carolina University, Greenville, NC 27858 The restoration of marine archaeological artifacts is a time intensive process involving years of careful curation, desalination, and electrolytic treatments. A shipwreck discovered in 1996 near Beaufort, North Carolina- believed to be the Queen Anne's Revenge (QAR), belonging to the pirate Blackbeard, is currently being restored at facilities near Greenville, NC so that it can be viewed in the North Carolina Maritime Museum. The extensive process associated with preserving the artifacts lends itself to microbial contamination and potential degradation of the wood artifacts. To prevent microbial growth, specifically of fungi, the QAR conservationists have added a biocide known as Proxel BD-20 to the storage tanks. This study seeks to evaluate the effectiveness of Proxel in controlling the microbial load during the restoration process, and to characterize the diversity of the resident microorganisms. The anoxic conditions of waterlogged wood provide an environment for erosion bacteria to reside and thrive in. Because the erosion bacteria can survive such an environment, they are predominantly responsible for the degradation of waterlogged archaeological wood. Previous work completed by researchers observing Scandinavian wood shipwrecks identified wood-degrading erosion bacteria, and determined the mechanism of their activities. The attachment of erosion bacteria leads to a formation of a trough in the wood cell wall, which further leads to degradation of the wood artifacts. Preliminary results have measured between 5.38 × 105 and 2.62 × 106 microbial cells/ ml in the restoration tanks, with strong correlation to Proxel BD-20. No nucleated cells (fungi) were observed in the waters. PCR reactions indicate the presence of bacteria in all of the samples observed. DNA fingerprinting analyses using terminal restriction fragment length polymorphisms (T-RFLP) are being used to compare the populations between the artifacts, and compared to standard pure cultures obtained on cellulolytic media. The outcome of this work will determine the effectiveness of Proxel BD-20 as a treatment method, will provide a basis for determining whether bacteria are actively degrading the wood artifacts, and could be used to identify alternative treatment methods, which could be applicable to both the QAR project and other studies.	P171
Comparison of Microscopic Methods for Characterizing Rock Hosting Microbial Communities, Hilary Conrad, Matthew Schrenk, Department of Chemistry, East Carolina University, Greenville, NC 27858 In dynamic subsurface environments, where fluid flow through fractures and pore space in rocks, most, if not all, of the resident microorganisms are found attached to rocks surfaces. However, standard methods for characterizing rock-hosted microbial communities rely upon the extraction of cells from the solid matrix. This study compares three different methods for characterizing the abundance and distribution of microbial cells in rock samples obtained from deep-sea hydrothermal vent chimneys, and high pH serpentinite ecosystems using epifluorescence microscopy. Microbial	P172

communities were characterized by 1.) cell extraction and filtration, 2.) direct observation of mineral associated populations using confocal microscopy, and 3.) in situ colonization experiments using sterile minerals. For the cell extraction procedure, fixed pieces of the rocks are sonicated and the supernatant is separated from the solids facilitating a replicable cell count. From carbonate samples we saw values ranging from 3.167 x 105 to 5.164 x 106 cells/g. A limitation of this procedure is that only a fraction of the microorganisms present will be obtained, providing a lower estimate on cell densities. Additionally, non-microbial debris causes blockage of the filter and can shield the cells from being observed under the microscope. A second approach involving the direct observation of cells captures the relationships within microbial communities and documents their association with mineral surfaces, but presents numerous obstacles in terms of imaging and quantification of the attached populations. Thirdly, the deployment of sterile mineral surfaces into the natural ecosystem can be used to observe and quantify the colonization of surfaces by microorganisms and their successional dynamics, but is logistically demanding, and in the process creates an artificial niche. In summary, each of these approaches has both benefits and limitations. In combination, they can be used to better understand the ecology and microbial activities in the subsurface environments.	
Phylogenetics of the millipede genus Brachycybe Wood, 1864 (*Diplopoda: Platydesmida: Andrognathidae*) using mitochondrial and nuclear genes, Nandita Rao, Michael Brewer, Jason E. Bond, Chad Spruill, Department of Special Studies, East Carolina University, Greenville, NC 27858 The arthropod class Diplopoda, the millipedes, is a mega-diverse group of mainly herbivorous detritivores found on all continents except Antarctica. Comprising more than 12,000 species, diplopods are often conspicuous soil dwellers that defend themselves via the production of noxious chemicals that are secreted, or even sprayed, from the sides of their body trunks. Despite their abundance and a wealth of interesting biological traits, they remain woefully understudied in many regards. A lack of research interest in modern times has resulted in many groups not being investigated systematically. While most millipede species are distinguished using characteristics of the gonopods (modified legs that serve as male sperm transfer appendages), not all diplopods have these structures. Still yet, some groups that do have gonopods do not show species-specific differences in these structures and must be diagnosed using other morphological characters that are often ambiguous. One such invariable group is the genus Brachycybe. Millipedes of the genus Brachycybe are primarily fungivorous and the eight recognized species are found in the southern Appalachian Mountains, the Ozark Mountains, Texas, Louisiana, California, Japan, Korea, China, and Taiwan. To help elucidate the diversity contained within the genus, we employed a molecular phylogenetic approach to better understand the evolutionary history of the species contained within Brachycybe. By using combined analyses of nuclear and mitochondrial genetic characters, we demonstrated: 1) the relationships between the currently recognized species, 2) the high amounts of genetic divergence within and between species, 3) the biogeographic history of the genus, and 4) the existence of a new cryptic species.	P173

Characterizing On-Site Wastewater Plumes with Electrical Resistivity Surveys , Sarah Hardison, Charles Humphrey, Matt Smith, Michael O'Driscoll, David Mallinson, Department of Geological Sciences, East Carolina University, Greenville, NC 27858 Non-point sources of pollution (NPS) originate from diverse sources and can travel long distances via shallow groundwater systems. Groundwater transported NPS pollutants eventually discharge into streams, lakes, wetlands, or other surface water bodies, but determining the specific origin(s) of the pollution is challenging. On-site waste water systems (OSWWS) are prime examples of NPS pollution and are the focus of this study. Each year an average 40,000 OSWWS are installed in North Carolina, adding to the already 2 million existing systems in operation. North Carolina law requires a 15+ meter offset between OSWWS and surface water bodies, yet studies have shown NPS pollution can migrate distances of 16-130 meters in the subsurface. The groundwaters affected by OSWWS NPS pollution typically have high concentrations of dissolved salts and solids, nitrogen, phosphorous, and bacteria and concern is growing over OSWWS NPS pollution loads to surface waters. For example, the Governor of Maryland recently proposed a ban on OSWWS because of the potential for water quality degradation impacting the Chesapeake Bay ecosystem. NPS pollutants have been shown to cause water quality degradation in NC within the Neuse, Tar/ Pamlico, and other river networks. Approximately 60% of NC coastal residences have OSWWS, and regulatory agencies have been asked to account for OSWWS NPS pollutant loads to surface waters. More research is needed to determine the fate and transport of OSWWS pollutants. However, the current methodology for determining the origin of NPS pollution from OSWWS and direction of migration with groundwater flow involves installing numerous monitoring wells, maintaining them, sampling groundwater, and gathering data; a method that is both costly and time consuming. The OSWWS site in Craven County was selected based on its proximity to the Neuse River, an important coastal river system in NC. The study evaluates the use of electrical resistivity surveys as a cutting-edge geophysical method used to track NPS pollution without disturbing property. Electrical resistivity data gathered from the site compared with corresponding groundwater quality data suggest that electrical resistivity surveys adjacent to wastewater plumes may help to reduce the number of monitoring wells and time needed to characterize the groundwater pollution potential at OSWWS sites.	P174
Techniques of Passive Solar Design, Matthew Howard, Brittany Pearce, Robert Thobe, Christopher Department of Technology Systems, East Carolina University, Greenville, NC 27858 Fortune, In today's society where natural resources are being used faster than are produced it is important to consumers and designers to start to design homes that are not only visually inspiring but that also help reduce our carbon footprint. An effective way to obtain both of these solutions is through passive solar design. Techniques of passive solar design are the least expensive way to design a home without the use of expensive solar panels or other costly means of becoming sustainable. These techniques include everything from the way you place a home on a plot of land,	P175

correctly choosing window sizes, and intelligently using landscaping to compliment an energy efficient design. The question is how do you create a new cost efficient design without going over a realistic budget? The use of aperture, absorbance, thermal mass, distribution, and control are examples of ways to achieve being sustainable as well as lowering society s carbon footprint on earth. Aperture is a way to concentrate the sun s light and energy through the use of certain windows at certain times of the day to effectively gain heat. An absorber is a hard, darkened surface that collects the suns heat. Thus the thermal mass is composed of the actual material that the absorber is composed of. Thermal mass is typically associated with masonry, stones, certain tiles, and even water. Once the solar energy is collected by these techniques, distribution can then be used to transfer throughout certain parts and/or all of the livable space. Lastly, the control element can be summarized as the use of certain building additives that help control the under and/or overheating of a particular home. An example of control would be using longer roof overhangs to minimize or maximize the sun s effect on a building. These techniques as well as innovation of modern aesthetics are going to create a community within the South Eastern portion of Raleigh North Carolina that thrives as well as contributes positively to the environment.	
ASMO: Getting Leaner, Bryan Britton, Corey Phelps, Department of Technology Systems, East Carolina University, Greenville, NC 27858 In modern industry, there is one term that can make or break any organization. This is known as Value Added Time, or VAT. Value added time is any time that is spent on increasing the value of a product. The opposite of value added time is simply, non-value added time, which is time spent where no value is added to the product. Non-value added time is a factor that should be reduced whenever necessary. There are also tasks that are mandatory and cannot be eliminated which create necessary time. This is time spent that does not increase the value of the product, but still must be completed. This non-value added but necessary time will be the main focus of our study.ASMO Inc. is a strong enforcer of lean principles, and is always seeking to improve their process. In order to maintain a lean environment, ASMO has put much emphasis toward improvement of the tote sorting area. Totes are the primary packaging that ASMO utilizes when filling customer orders. These totes are filled with ordered parts, shipped to the customer and then returned to ASMO. Upon arrival at ASMO, these totes must be inspected, sorted, and sent back to their respective departments so that they may be refilled with parts in preparation for the next customer order. The goal of this project will be to eliminate as much non-value added time as possible, and to increase time spent on necessary and value added tasks.	P176
Energy Savings Technologies in New and Previously Constructed Homes, Johnathan Dennis, Chris Duryea ,Regan Sigler, Hannah Tart, Ethan Ayers, Department of Technology Systems, East	P177

Carolina University, Greenville, NC 27858 Builders of Hope (BoH) retrofits older homes and turns them into newer, more energy-efficient homes in anticipation of giving working families efficient homes that have smaller ecological footprints. Smaller footprints are achieved with the use of proven technologies; however, there are a number of very affordable technologies on the market that have shown promising results. This study will look into the energy reductions that can be expected in BoH's newest neighborhood (located just blocks from downtown Raleigh, NC), should key technologies be implemented in the retrofitted homes. The criterion for choosing a technology for study include: implementation on existing structures must be possible (ie, they do not need to build a brand new structure for implementation to occur) and it must be an "affordable" technology, so that neighborhoods in other areas of the nation could implement them, regardless of their area's economic situation. The technologies included in this study are as follows: using cool roof color materials (or CRCMs, for short) and applying them to metal roofs; sealing off water heaters from losing its contents heat to the surrounding area; and installing triple paned windows filled with inert gases instead of air. These technologies will be implemented (in this specific case) by BoH and its teams. With this in mind, cost is a concern, as they are a non-profit organization that sells these homes at cost to families. With this in mind, all of the technologies we implement have to be affordable in the long run (ie, low maintenance costs; longevity of the materials). Even though many of these technologies might cost more up front than traditional methods, we intend to find long-term energy savings that will make the cost-benefit ratio of these technologies worth the extra initial investment. These large energy savings can translate into large amounts of money in the pockets of the families, which can then be used to spur economic growth in the local economy.	
Residential Landscaping Practices in Wake County, North Carolina as a Means of Improving Home Energy Conservation, Bryce Oakley, Antwan Edwards, Tyler Hicks, Joshua Johnson, Ryan Ramsey, Department of Technology Systems, East Carolina University, Greenville, NC 27858 As humans, it is not possible for us to control temperature, wind, or other weather elements. Through specific landscaping practices, it is possible to control the micro-climate in and around our homes. By particular placement of plant life, landscape structures and control of certain ground aspects, we can reduce the amount of energy required to keep a home comfortable all year long. Through research and simulation, it is possible to establish the benefits of strategic and energy-efficient landscaping to a residential homes utility. Research will be conducted on central North Carolina, specifically Wake County's winter heating factors and summer cooling factors for a residential home as well as the total benefit of tactical landscaping practices for this climate. The main idea is to develop the most economical means of landscaping with the greatest return on utility savings. The major landscaping factors researched will include the strategic shading and not shading of specific regions of a home from solar radiation, the creation of specific wind breaks or shelters to divert or channel air movement to or away from a home; as well as transpiration, the cooling affect created by the	P178

evaporation of water from plant-life. Our research will extend to the best way to maintain a home's landscape through efficient water use, choices on native vegetation, as well as the control of surface quality around a home. From our investigation we should discover the most proficient landscape techniques for Wake County, NC as a means to reduce home energy cost, the total benefit, and the best way to maintain this type of landscape.	
Harper Brush Pressure Sprayer Guard, Robert Daniel, Spencer Fox, Department of Technology Systems, East Carolina University, Greenville, NC 27858 At Harper Brush the goal of their company is to manufacture quality cleaning products at affordable prices. One of Harper's current projects includes designing a pressure sprayer guard that is used to protect brick walls from being damaged from the high pressure of the water. After brick walls are made, contractors use pressure sprayers to clean the bricks of excess mortar and dirt. In many cases though workers would position the pressure sprayers too close to the walls and spray remove the mortar in-between the bricks. This would then result in the compromise in the wall and would require the wall being rebuilt. The guard is being designed CAD to show the dimensions and then is created in Inventor to show a 3D model of what the guard will look like. After all of the dimensions and the model are approved a scaled prototype of the guard is made in a 3D printer. Once the scale model is viewed and the customer is able to see what the guard looks like. With the prototype Harper can then use it in designing a mold that will efficiently make this guard. Once a working mold is made then manufacturing of the guard can then be implemented and production can begin.	P179
Harper Brush VersaCall, Pawan Bhat, William Anderson Winbourne, Department of Technology Systems, East Carolina University, Greenville, NC 27858 Here at Harper Brush Greenville NC, our project acquires us to understand and develop the VersaCall software for the Injection Molding Machines. Once understanding the software we are required to implement the knowledge we have learned into integrating other machines with the software to calculate their production cycle, scrap, machines status, resign status, color status and run time, order number, job number and operator number. So that we can project onto a flat panel where all of the information can be easily identified and sorted. We must program the VersaCall data input module to make it more operators friendly and efficient. While doing this we will train all personnel how to input data into the VersaCall data input module without hindering their work speed.	P180
Grey Water Re-Usage Methods, Amber Idol, Fredde Rivas, Christopher Borrell, Joseph Worthington, Andamo Ford, Department of Technology Systems, East Carolina University, Greenville, NC 27858 Gray Water, which is water produced from bathroom sinks, showers, washing machines, and rain	P181

runoff, can be re-used for irrigation and toilet flushing. The average household containing 2.6 people, can save about 100 gallons of water per day. If water efficient methods, pertaining to Gray Water reuse were applied, water consumption would decrease as well as the water bill. Gray Water can be filtered and re-used inside the home and out. Since Gray Water is not a new technology, at this point research is being done to make re-usage more efficient. This research includes improving the methods of treatment for the Gray Water, such as the use of disinfectants and UV lamps. The "AquaCycle", created by *Pontos*, is a new filtration method that doesn't use disinfectants in their product. Instead this filtration method uses oxygen and microorganisms to treat the Gray Water, thus providing a more organic method of filtration. Also, there are new designs for the way Gray Water is re-used, for example the sink/toilet combination. This is a relatively new concept, but the design may not be ideal for all structures. A more conventional design could integrate the sink and toilet by direct plumbing, and still have the same effect as the sink/toilet combination. North Carolina permits the use of Gray Water treatment systems and the use of treated Gray Water for irrigation and flushing of toilets. The methods mentioned can be applied to existing homes along with new homes. The technology of re-using Gray Water is not predominately used in the average American home. This could be from the fear of disease after re-using Gray Water, even though no health issues have ever been documented. By creating a more conventional design, and integrating better methods of filtration, this technology will become a design standard.	
The Quest for Ubiquitous Access in North Carolina's High School: The Digital Divide in Rural North Carolina, Heather Ayers, Department of Curriculum and Instruction, East Carolina University, Greenville, NC 27858 Since the 1970s, globalization has been rapidly shifting the world toward an information and technology-based economy. North Carolina has seen significant change in the traditional agrarian and manufacturing economy as industrial technologies increasingly become leading economic forces. The need to prepare students to successfully operate and work in a technological world has begun to come to the fore front in the educational community, particularly in North Carolina's high schools. Programs such as the e-NC Authority and e-Rate have been trying to close the educational gap between North Carolina's students and the global community by providing reduced rates to disadvantaged regions, but for many students the digital divide continues to widen. The digital divide in North Carolina can be clearly seen to fall along geographical and socioeconomic lines, with our rural and low-SES students being left behind in the global information revolution. The North Carolina public school system should reexamine its technology policies and curriculum in order to address 21st century literacy skills to students in rural and low-socioeconomic status regions throughout the state. We have been studying the difference in available access in rural and densely populated counties in eastern North Carolina, focusing on Pitt and Martin counties. We have found that the number of service providers in rural counties as compared with the number of service providers in more urban counties has made it financially more difficult for residents in rural areas to access the internet and other 21st century technologies. This has forced the school systems in rural counties to funnel funds	P182

into providing 21st century hardware, software, and technologically training to provide students with the skills necessary to succeed financially, socially, and academically in the 21st century. This extra financial burden is putting a strain on the rural school systems who are already struggling with budget cuts and reduced force.	
Utilization of Expert Client for Interim Feedback in Engineering Design Project. Paul Cox, Stephanie Sullivan,Cathy Hall,Eric Buller, Department of Engineering, East Carolina University, Greenville, NC 27858 Students in the Engineering Project Management course complete a semester long project to gain experience in project planning, scheduling, monitoring and engineering design. The spring 2011 project involves conceptual and propulsion design for a Ground Combat Vehicle (GCV) based on a current U.S. Army Request for Proposal (RFP) issued in January 2011. The semester project kicked-off by a student viewing of the movie The Pentagon Wars which exposed poor quality testing of the Bradley armored vehicle. The film was based on the book of the same name by Colonel (Ret) James G. Burton discussing actual events over an approximately twenty year period in the vehicle's development and ultimate production. Students assessed the design of the Bradley based on this viewing. Then, at mid-semester, they reviewed their own course student projects with the same assessment. We compared this data. Also, an expert client with over ten years experience as a tank unit commander, came to the class mid-way for a question and answer session in which he assisted students and evaluated student designs for considerations based on his expertise. Both students and the client were given a brief survey before the session on expectations for the interaction, and then a post-assessment on its success and relevance to the project. We analyzed and discussed results of these surveys.	P183
Government and medicine: the evolution of the Chinese health-care system, Brittany Carr, Brody School of Medicine, East Carolina University, Greenville, NC 27858 Politically, China's journey to present day features a wide variety of government types. China's diverse political history offers the unique opportunity to explore how a nation's government impacts its approach to medicine and public health. By utilizing literature review methodology, the relationship between Chinese government and health-care was investigated. The dominant theme that emerges from this data is that the evolution of Chinese medicine directly reflects the trends in political rue of that time. The successes and failures at each stage of China's health-care system provide other nations with vital information for how to adjust the influence their own governments have on medicine. In particular, the Chinese and United States superpowers have an opportunity to work together as the former moves to universal health coverage and the latter prepares for major health care reforms.	P184

North Carolina Contemporary Indians: A Sense of Place, Martha Wharton, Department of Interior Design and Merchandise, East Carolina University, Greenville, NC 27858 This study examines the North Carolina Indian Tribes' sense of place as it has persisted and evolved in the last century. Focusing on contemporary natives is important to deter the portrayal of Indians as a static culture and to provide a platform for further discussion and understanding. As a part of a larger study, led by Associate Professor Rebecca J. Sweet, this study utilizes qualitative research methods, which evolve with the information gathered in the study, to create a complete picture of contemporary Indian life. A sense of place is important because it helps a designer to understand why members of a group connect with their environment. The most important connection in Indian life is community. There is a sense of community that has persisted throughout struggles faced by contemporary Indians. This sense of community has been encouraged by churches and Indian schools. Also, a warrior spirit has persisted and has encouraged a sense of community. Veterans and active duty military are revered among the community, "… historically, Native Americans have the highest record of service per capita when compared with other ethnic groups" (Naval History and Heritage Command). Community is also encouraged by art. When elders teach traditional art forms to the younger generation, bonds are formed that continue a sense of community. For this study, art has been utilized to visually represent some of the mechanisms of culture that have evolved into recognized Indian society today. Traditional and art quilting techniques are used to create a cohesive picture of what creates a sense of place for contemporary communities and the major locations of these communities. The qualitative research on a sense of place centers on human interaction and participation. In addition to interaction, this study used historical accounts, books, and newsletters to reveal common themes in contemporary native life. As part of Professor Sweet's larger study, digital photographs are being taken by the tribes to document their sense of place. Interviews will be arranged to discuss and learn more about why and what those photographs represent. The undergraduate study helped demonstrate how a sense of place evolves and how it influences the interactions of people.	P185
The Overall Efficiency of Selected Residential Insulation and Roofing Materials, Jonathan Messer, Isaac Edwards, Michael Schultz, John Switzer, Department of Technology Systems, East Carolina University, Greenville, NC 27858 Sustainable structures, or structures that are financially bearable, not only in regards to construction, but also in maintenance and upkeep, is one of the fastest growing sectors of the residential construction market. The hope is that such buildings will reduce overall energy usage, conserve resources, and slow urban blight. To encourage growth and adoption of sustainable residential design, federal and state tax incentives, as well as programs at local levels, have become popular. Accordingly, it is important to research emerging sustainable technologies that could be incorporated	P186

in such residential design projects, and what affect these alternatives may have on the efficiency of new construction, both to the end user in energy and maintenance costs as well as to the builder in installation costs. This study focused on the effect of sustainable roofing and insulation products on the overall efficiency of sustainable designed homes located in Central North Carolina climate zones as defined by the International Energy Conversation Code. To better narrow the scope of this project, the products studied were limited to a traditional material compared with the most promising of new sustainable solutions. For insulation this resulted in a meta-analysis of traditional fiberglass, and expanding foam insulation while roofing was limited to asphalt shingles and metal shingles. Additionally, various finishing or installation techniques that may improve efficiency when used in conjunction with the aforementioned insulation and roofing products were considered. Findings from this project further advance the understanding of the efficiency of sustainable insulation and roofing materials in residential structures built in the central North Carolina climate zone.	
Essential Functions Analysis, Kimberly Weaver, Constanse Floyd, Daniel Lee, Josh Carr, Mike Markowkin, Sepideh Jahromi, Department of Engineering, East Carolina University, Greenville, NC 27858 At the New Bern location, Moen Incorporated manufactures one and two handle faucets for kitchens and bathrooms. The bulk of production is carried out by material attendants, material stockers and production operators. These three factory positions utilize an array of different functions and Moen desires that each function be analyzed according to job factors characterized as either essential or marginal. An essential function encompasses the basic job duties that an associate must be able to perform with or without reasonable accommodation while marginal functions are those that are performed but are not essential to the job. The data collection consists of observation, interview, and functional analysis and is conducted to establish the differences between essential functions and marginal functions. The data collected from these three steps was then grouped into the following categories for further analysis: physical requirements, physical surroundings and hazards, cognitive processes and miscellaneous. Task tables for each position were then constructed with percentages placed on these charts to represent the amount of time an employee may expect to spend doing a task during a working day. From the task tables, checklists and detailed descriptions were developed for each position noting all of the essential functions for that position. The checklist is a quick glance at these essential functions while the detailed descriptions provide a background for why these various functions were deemed essential. NIOSH equations were applied based on measurements taken in the facility in an effort to locate areas of weakness and make recommendations for improvement. Through the use of the NIOSH equations and injury data obtained from Moen, the recommendations for the facility, such as introducing new tools, will be focused at reducing worker injury and pain. As a result of this project, safety within the facility will increase significantly.	P187

NASA Capstone Abstract, Taylor Brown, Jamelle Simmons, Anna Smith, Christian Denard, Department of Technology Systems, East Carolina University, Greenville, NC 27858 Our aim is to design and build a system which will identify the emotional state and display it in a format which can be attended to or ignored. In a high stakes, stressful situation, performance errors can lead to disastrous results. In order to help an operator manage such stress we are designing and building a system which maps emotional state to color and intensity of ambient lighting. The emotional state will be estimated from physiological signals such as heart rate variability. A LabVIEW program will interpret these measures along a positive and negative axis in real time. The estimate of emotional state will control the color and intensity of an LED lighting strip. This display provides unobtrusive and timely information about the operator's emotional state, which they may choose to incorporate into their decision making. This will help users make conscious decisions that will improve their overall performance on a variety of tasks such as athletics, aviation, military, and education.	P188
Preventive And Predictive Maintenance Program Design For An Industrial Equipment Fabrication And Repair Facility, Scott Reed, Dao Dinh,Adam Hussaini, Department of Engineering, East Carolina University, Greenville, NC 27858 Carver Machine Works Inc. (CMW) fabricates components and machines parts for a wide range of industries. The diverse needs of these customers require that CMW maintain a large and flexible range of fabrication equipment. To assure the readiness and capability of these assets, a maintenance program was identified as a strategic need. In addressing this need there were two viable maintenance alternatives; preventive and predictive. Preventive maintenance focuses on scheduling periodic routine maintenance procedures to decrease equipment failures, and is often managed by a computerized maintenance management system (CMMS). On the other hand, predictive maintenance is based on monitoring the condition of equipment by analyzing quantitative data from various measurements such as vibration and heat output, and attempts to schedule maintenance only when needed. The program designed for CMW combines these two maintenance approaches, and creates a maintenance system that will possess the flexibility to cover the wide range of equipment types and be expanded to include more equipment as the needs of CMW customers change. The preventive aspect of the design reduces equipment failure while failure history is gathered. The preventive methods build a foundation for the future of CMW as their needs change. The result of the project is a system which cost effectively meets current needs while providing a future direction. The benefits of this project include reduced equipment and production downtime, more efficient inventory management, and increased profits.	P189
Rheological Functionality of Cross-linked Whey Protein Isolate/Pullulan Gels, Jamelle	P190

Simmons, Eric Franson, Mohammed Akbar, Department of Engineering, East Carolina University, Greenville, NC 27858 Whey proteins and pullulan have a variety of uses in the food and pharmaceutical industries for their functionality over a wide range of conditions (pH, temperature, concentration) with the addition of cross-linkers (transglutaminase and sodium trimetaphosphate). Transglutaminase (TG) is an enzyme that cross-links the amino acids glutamine and lysine through covalent bonding in proteins to enhance their properties while sodium trimetaphosphate (STMP) cross-links the repeated polymer chains of pullulan to further enhance its properties. This project investigates the interactions of whey protein and pullulan blends of various concentrations and pH when subjected to chemical and heat treatment. We aim to determine how TG and STMP impact whey protein-pullulan blend viscoelastic properties. Rheological testing is used to track the formation of the gels, and ultimately determine their yield stress. One critical observation noted is that gels at pH 8 had yield stress an order of magnitude larger than those at pH 5.2, the isoelectric point of primary whey protein Beta-lactoglobulin.	
Impact of sodium trimetaphosphate on aqueous protein-pullulan solution rheology and electrospinning, Adam Hussaini, Department of Engineering, East Carolina University, Greenville, NC 27858 Aqueous solutions of protein-pullulan blends were prepared at various pH and concentration to determine the impact of sodium trimetaphosphate (STMP) on solution rheological parameters at 25 °C. Gelation kinetics were observed following the STMP addition to the solutions in order to determine if an electrospinning window exists to form an insoluble mat in situ. Solutions were electrospun to form non woven fiber mats with and without STMP to determine fiber properties. Protein-pullulan blend mats were evaluated with scanning electron microscopy to determine nanofiber diameter; preliminary results for mean nanofiber diameter ranged from 260-580 nm. Studies to evaluate model hydrophobic drug Rhodamine B release from nonwoven mats in phosphate buffer solution at 37 °C were also conducted using UV Spectroscopy.	P191
Energy Consumption in Low-lift Walkie Trucks, Matthew Liverman, Department of Engineering, East Carolina University, Greenville, NC 27858 NACCO Materials Handling Group Inc. requires an improved understanding of energy consumption in 4000 lb. low-lift pallet walkies. This project will analyze energy consumption and efficiencies of the components of the walkie truck, design and create simulation software used to calculate energy consumption given specific operational parameters, identify areas where the walkie truck s energy efficiency can be improved, and propose recommendations for implementing improvements. Scenarios for various operating and loading conditions will be developed and used to test the walkie truck. With the use of an EDAQ, or an electronic data acquisition device, values for current, voltage, speed, and other desired properties can be collected in real-time and stored as data points to be	P192

analyzed with spreadsheet software. Efficiencies of the main power consuming components will be tested using a dynamometer onsite at NACCO Inc. Characteristic data will be developed from the data collected with the EDAQ and used in an Excel simulation to model the energy consumption of the truck. Outputs for the simulation will include amp hours consumed, total battery power consumed, remaining battery time and the overall efficiency of the truck. Recommendations for improvements are still being investigated.	
Rear Impact Guard Test Stand, Michael Trapani, James Herrison, Clinton Reges, Department of Engineering, East Carolina University, Greenville, NC 27858 VT-Hackney, a VT-Systems company, specializes in designing and fabricating specialized vehicles such as Emergency Medical Service vehicles, fire trucks, and refrigeration units. A key component in the design of the specialized vehicles manufactured by VT-Hackney is the rear impact guard. The rear impact guard serves as an impact bumper system attached to the rear of semitrailers and trailers. The guard s purpose is to reduce the number of human casualties resulting from collisions between compact cars with the rear of trailers and semitrailers. Each guard is designed and tested to specific regulations established by the U.S. Department of Transportation (DOT) and Transport Canada Safety and Security. VT-Hackney does not have the equipment to properly test and certify rear impact guards on-site, therefore guards are shipped to a third-party testing facility in Michigan. Testing guards off-site is a time consuming and expensive process and VT-Hackney is interested in investing in a test stand to provide on-site test and certification capabilities. This project consisted of designing an impact guard test stand for VT-Hackney. The benefits of on-site testing are the reduced turn-around time per design iteration and the elimination of shipping and third-party testing costs. There are three primary design elements that combine to form the test stand which include a force application system, existing test structure modifications, and an integrated control system. The goal of this project was to integrate the three subsystems to produce a successful testing system that meets all regulatory requirements and provides VT-Hackney with on-site testing and rear guard certification capabilities.	P193
Pullulan nanofiber crosslinking, Thomas Deaton, Stephanie Sullivan, Victoria Miller, Department of Engineering, East Carolina University, Greenville, NC 27858 Aqueous solution electrospun nanofibers of the polysaccharide pullulan have been produced and evaluated by our laboratory. A minimum solution concentration of 15 w/w% is required to produce defect free nanofibers. Pullulan is a very water soluble polymer that dissolves instantly upon contact with water. Therefore, it serves as a good foundation for instant release drug and flavor delivery. However, applications such as tissue scaffolding would require nanofiber mat sustainability for longer periods of time. Our work aims to crosslink pullulan nanofiber mats to render them insoluble in water. Crosslinked nanofiber mats were formed using both vapor and submersion methods and upon contact with water form a hydrogel. Solution properties were evaluated with rheological	P194

techniques while nanofiber mat characteristics were tracked and evaluated with reflected light and scanning electron microscopy. Release studies from the wetted nanofiber mats containing model small molecule drug Rhodamine B were performed.	
Solution electrospinning of hydroxypropyl-beta-cyclodextrin and pullulan blend nanofibers, Clayton Rice, Joseph Rose, Department of Engineering, East Carolina University, Greenville, NC 27858 Utilizing a solution electrospinning technique, we have combined a small molecule hydroxypropyl-²-cyclodextrin (HP²CD) with the biocompatible polysaccharide pullulan to develop functionalized nanofibers. The solutions containing different amounts of pullulan (0% - 20% (w/w)) and HP²CD (0% - 70% (w/w)) were electrospun. Solutions with pullulan concentration below its critical entanglement concentration were able to form defect-free nanofibers upon the addition of HP²CD. This is unique because HP²CD is a small molecule in lieu of a spinnable polymer. For example, a solution with 10 w/w% pullulan with the addition of HP²CD formed defect free; whereas without the HP²CD the electrospun pullulan mat is dominated by micro- and nanoparticles in lieu of fibers. Blend solutions were evaluated for conductivity, surface tension, pH and viscoelastic properties including viscosity. Resulting nonwoven nanofiber mats were evaluated with various techniques including Reflected Light and Scanning Electron Microscopy, Differential Scanning Calorimetry and Fourier Transform Infrared Reflectance Spectroscopy.	P195
Crosslinking of protein-polymer solution electrospun nanofiber mats by heat treatment method, Dustin Rogers, Abel Tesfaslassie, Stephanie Sullivan, Department of Engineering, East Carolina University, Greenville, NC 27858 Solution electrospun nanofiber mats have been produced from whey protein blended with either poly(ethylene oxide) or pullulan spinnable polymers. These materials are biocompatible, thus suitable for tissue scaffolding. In order to use these nonwoven mats as tissue scaffolds for growth and migration of stem cells into heart cells, mats were heated in order to crosslink the protein and render the mat insoluble or partially insoluble in water. Our laboratory has demonstrated that heat treatment at 100°C for at least 12- 24 hours will render such mats. This project aims to determine how the mat aqueous solubility and tensile strength varies with heat treatment time and effective mass. Mats were evaluated before heating, after heating and after water soaking/drying step with reflected light and scanning electron microscopy as well as Fourier Transform Infrared Reflectance spectroscopy. Tensile strength of the mats was evaluated before and after heat treatment using an Instron machine.	P196
Reduction of VOC Emissions, Catherine Smith, Victoria Miller, Department of Engineering, East	P197

Carolina University, Greenville, NC 27858 The fiber manufacturing process at the DSM Dyneema Greenville plant produces solid and liquid startup material that is not useable at this time. Liquid solution is mostly composed of Chemical X that is fed into a holding tank via a piping system. The liquid solution is eventually taken off site for recovery and reuse. Solid startup material, which is soaked in Chemical X, is manually collected in containers and stored onsite until disposal. The liquid startup solution with Chemical X leaches out and produces volatile organic compound (VOC) emissions. The occurrence of these emissions is infrequent. The process improvement project is to effectively reduce the VOC emissions produced during the various stages of transport and disposal of startup material in a specific area of the production process by at least 50%. The project only focuses on a [REDACTED] portion of the production building; there are other areas where VOC emissions occur that are not part of this project. This project involves the detailed design of a new system for transportation of the startup material and the liquid solution. Prior to the detailed design of a new system, multiple alternatives will be developed and proposed to DSM Dyneema. One alternative is a no cost, simple alternative which involves a procedural change only. Another is a low to medium cost alternative which involves preventing Chemical X from being exposed to the atmosphere during transport. The last, most complicated and highest cost alternative is to introduce a vacuum capture method to reduce emissions by at least 50%. Potential design solutions were organized in a decision matrix which weighed the pros and cons of each solution. Using this matrix, along with information gained from key personnel at DSM Dyneema, a solution was decided upon. The solution involves redesigning of the transport vehicle and of the VOC emissions collection process.	
Safety Restraining Device for Aft Transmission Installation and Removal, Matt Uzzell, Ken Drake, Chuck Norris, Department of Engineering, East Carolina University, Greenville, NC 27858 NAVAIR, Marine Corps Air Station, Cherry Point, NC services and maintains a fleet of H46 tandem rotor helicopters. The aft transmission is frequently removed and installed using a bomb hoist for regular and unscheduled maintenance both on site and in the field. The procedure holds significant risks for damage to equipment. Specific risks due to uncontrolled free fall of the transmission include damage to the aft transmission housing, internal parts, and damage to other components in the helicopter. NAVAIR requires a safety system design to minimize or eliminate these risks. The safety system should cover the entire range of motion of the lift, allow a maximum 12 inches of vertical travel in the event of hoist failure, operate without external power and be field deployable. Further, the design must cost effective, have minimal effect on maintenance and safety procedures, and meet any required proof-load, non-destructive and periodic inspection requirements.	P198
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Water Conservation Analysis and Design for DSM Pharmaceuticals, David White, Travis Marsh,Nathan Berkner, Department of Engineering, East Carolina University, Greenville, NC 27858 DSM Pharmaceuticals requires that the engineering capstone design team from East Carolina University reduce the water consumption in building 1 at the plant in Greenville, North Carolina by 10% to allow for increased production capacity. The company requires water for their abatement systems, which are predominantly wet scrubbers. These devices are necessary to dispose of pollutants, volatile organic compounds and particulate matter (VOC and PM respectively) created during manufacturing. Currently, DSM utilizes approximately 76 gallons per minute to abate VOC's in a single scrubber. This abatement system currently disposes of the pollutants with an efficiency of approximately 70-85%. The ECU capstone design team investigated several modes of alternative abatement systems and discovered the optimal choice for abatement, which will reduce water consumption, would be the installation of a regenerative thermal oxidizer (RTO). An RTO, under optimal conditions, works with an abatement efficiency of approximately 98% and does not require any water input. The design team has constructed a plan that will allow for the RTO to be attached to two coating and drying rooms. The system can operate with a maximum 8,000 cfm air-input and is self-sustaining (does not require natural gas to continue burning) if the system is applied with enough VOC's. The total cost of the RTO will be approximately $750,000 to buy the equipment, install the system, and connect the duct work so the system can operate with the selected rooms. The installation of the new system has the potential to decrease the water consumption in building 1 by 11.6 million gallons/year, saving approximately $81,000 per year; the reduction in water usage will be approximately 17% in building 1. The higher efficient system will allow for increased production capacity due to the mass transfer capacity increasing with the more efficient system.	
Design of a Universal Filter Containment Housing, Samuel Millard, Joe Rose, Cory Boughton, Sam Millard, Department of Engineering, East Carolina University, Greenville, NC 27858 Our ECU capstone team was chartered by Camfil Farr to redesign their two different filter containment housing into a universal filter containment housing which can facilitate the specifications for either filter housing type. A Filter Containment Housings is to enclose a High Efficiency Particulate Air (HEPA) Filter in place; the HEPA filter removes dangerous material from the air whilst protecting the operator and environment from dangerous materials. Camfil Farr requires a universal housing which allows the production of a single mainly universal housing which can be outfitted based on the consumer requirements. Currently Camfil Farr manufactures separate housings for each of the two types of filters; a gasket seal filter housing which is used primarily by the nuclear industry and a fluid seal filter housing used by the pharmaceutical industry and others.	P200

Developmental Regulators in the Red Alga *Porphyra*, Justin Perry, John Stiller, Department of Biology, East Carolina University, Greenville, NC 27858 Our lab currently is investigating developmental genetic regulators in the red algae *Porphyra purpurea* and it's closely related sister species *P. umbilicalis*. This comparison is possible through the use of genome-wide expressed sequence tag (EST) data, which we are evaluating against known developmental regulators from model plants and animals that are available in the online sequence database from the National Center for Biotechnology Information (NCBI). More specifically, my project is focused on determining what members of the SNF2 family of DNA helicases are present, and whether the SWI/SNF complex is expressed in *Porphyra*. In model systems, SNF2 is a core component of the SWI/SNF complex, which functions in regulating expression via chromatin remodeling. We have found a number of sequences with conserved signature regions for the SNF2 family in our EST data. These sequences were identified through BLAST similarity searches by comparing them to known SNF2 sequences from plants and animals, then edited in the alignment program Sequencher to infer a protein sequence from each EST. Protein sequences were assembled into an alignment for phylogenetic analysis to determine what SNF2 subfamilies are represented. Although most recognized SNF2 subfamilies are present among *Porphrya* ESTs, we found no significant evidence for other core components of the full SWI/SNF remodeling complex.	P202