

9TH ANNUAL

RESEARCH & CREATIVE ACHIEVEMENT WEEK

MARCH • 23 - 27 • 2015

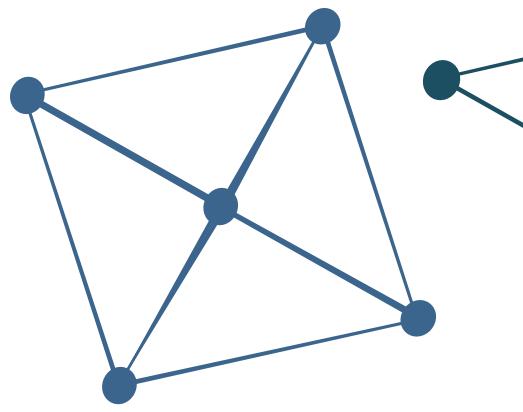
MENDENHALL STUDENT CENTER

 #RCAW2015

 @ECUGRAD SCHOOL

ECU.EDU/GRAD



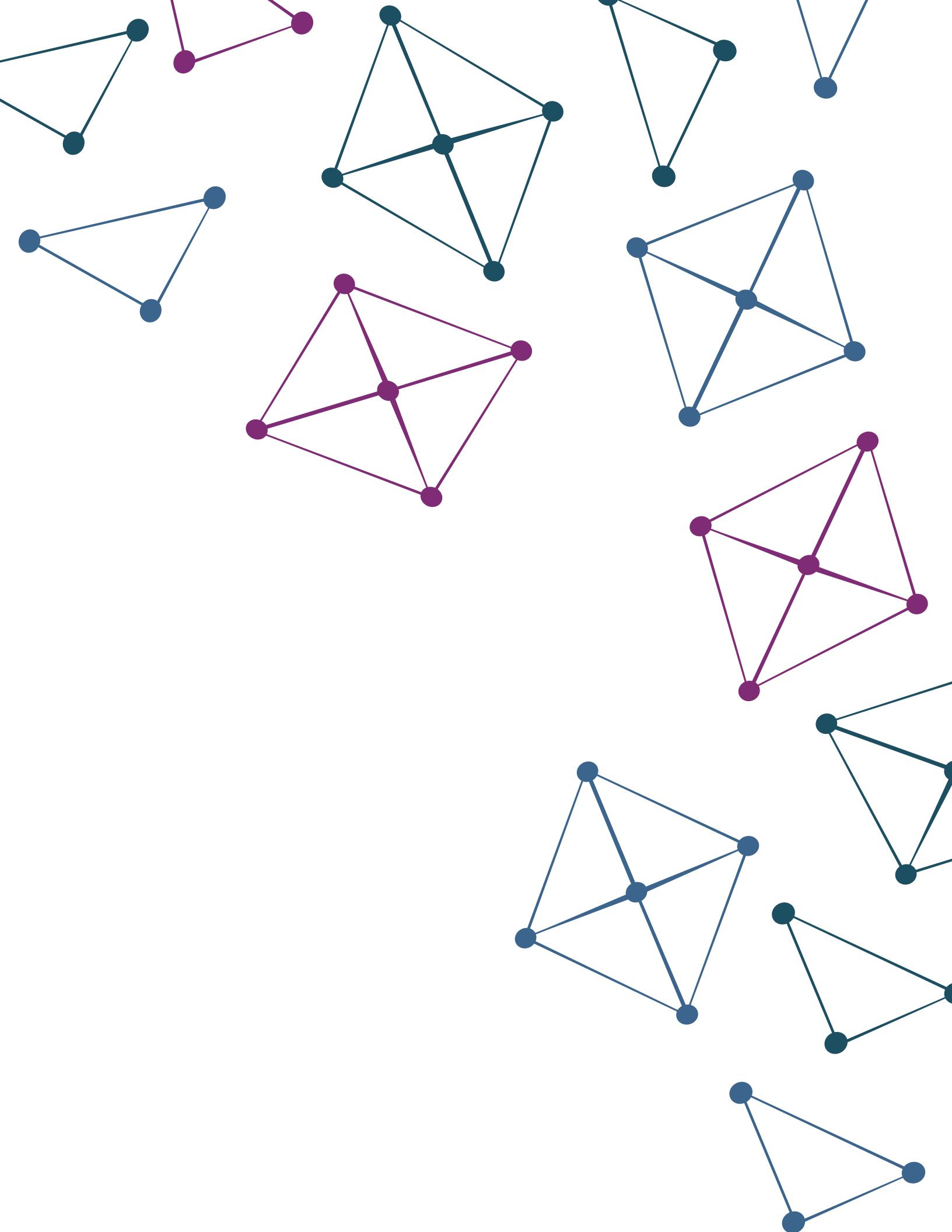


RESEARCH & CREATIVE ACHIEVEMENT WEEK

2015

We would like to give a special thanks to ECU School of Art and Design graphic design undergraduate student Kristen Bitar, for her cover design, poster, and program art.

We would also like to recognize Master of Adult Education student Laura Taylor and Doctoral of Physics student Taylor Dement, for their development and management of the program.





East Carolina University®

Division of Research & Graduate Studies

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Greenville, NC 27858-4353

Michael R. Van Scott, PhD
**Institutional Official & Chief Research Officer;
Associate Vice Chancellor, Interim**
252-328-9471
252-328-2769 fax

March 2015

Greetings!

I am pleased to invite you to participate in the **East Carolina University Research and Creative Achievement Week** (RCAW). The week of **March 23-27, 2015**, has been set aside to highlight the extraordinary accomplishments of our students in research and creative activities. 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 strongly encourage your students to attend. The event is sponsored by a partnership of these entities: Division of Academic Affairs, Division of Health Sciences, Brody Graduate Student Association, Graduate and Professional Student Senate, Office of Undergraduate Research, Office of Postdoctoral Affairs, Graduate School, and Division of Research & Graduate Studies.

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 375 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 and poster presentations will take place on Monday, March 23 (Graduate Presentation Day); Tuesday, March 24 (Postdoctoral Scholar presentations); and Wednesday, March 25 (Undergraduate Presentation Day) with most posters on display for an additional day each. In addition, we have online presentations for both undergraduate and graduate students.

This year, we are making an emphasis on student and student-faculty collaborative work. The Honors College Research Poster Showcase is a new event to be held on Tuesday evening. The International Scholars Symposium will take place on Tuesday afternoon. The College of Education Faculty and Student Research Showcase will be on Wednesday afternoon. The Scholar-Teacher Awards and Symposium at which faculty will be recognized for the integration of research into their teaching will be held on Thursday, March 26. The whole week is capped off with the announcement of the student and postdoctoral scholar award winners at noon on Friday, March 27.

Please consider encouraging your classes to attend specific discipline-related oral student presentations on Monday, Tuesday, and Wednesday or to view the poster presentations Monday through Thursday.

Visit the RCAW blog at <http://blog.ecu.edu/sites/rcaw/> for a schedule of events (click on Schedule).

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

A handwritten signature in black ink.

Michael R. Van Scott

Table of Contents

- 05 Letter from Vice Chancellor, Michael R. Van Scott
- 09 Program Sponsors
- 10 Research and Creative Achievement Week Committees
- 11 Event Schedule
- 13 Lectures and Symposia
- 29 Mentor Listing
- 30 Student Presenter Schedule
 - 30 Graduate Oral Presentations
 - 35 Graduate Poster Presentations
 - 42 Online Poster Presentations
 - 43 Postdoctoral Poster Presentations
 - 44 Undergraduate Oral Presentations
 - 47 Undergraduate Poster Presentations
- 56 Graduate Abstracts
 - 56 Oral Presentations
 - 82 Poster Presentations
- 130 Online Presentations
- 132 Postdoctoral Abstracts
 - 132 Poster Presentations
- 136 Undergraduate Abstracts
 - 136 Oral Presentations
 - 148 Poster Presentations
- 194 Presenters' Index

Program Sponsors

Division of Academic Affairs

Division of Health Sciences

Brody Graduate Student Association

Graduate and Professional Student Senate

Office of Undergraduate Research

Office of Postdoctoral Affairs

Graduate School

Division of Research and Graduate Studies

Planning Committee

Tom McConnell: The Graduate School, RCAW Chair

Mary Farwell: Biology, Office of Undergraduate Research, RCAW Co-Chair

Abbie Brown: Mathematics, Science, and Instructional Technology Education, College of Education

Virginia Carraway-Stage: Nutrition Science, College of Human Ecology

Bob Chin: Technology Systems, College of Engineering and Technology

Thomas Croskery: President, Graduate & Professional Student Senate, Mathematics, Thomas Harriot College of Arts and Sciences

Taylor Dement: Biomedical Physics Student, Thomas Harriot College of Arts and Sciences

Nicole Devaul: President, Brody Graduate Association, Anatomy and Cell Biology, Brody School of Medicine

Paul DeVita: Kinesiology, College of Health and Human Performance

Christyn Dolbier: Psychology, Thomas Harriot College of Arts and Sciences

Melani Duffrin: Nutrition and Dietetics, College of Human Ecology

Nehad Elsawaf: Economics, Thomas Harriot College of Arts and Sciences

Rich Franklin: Microbiology & Immunology, Brody School of Medicine

Derrick Isler: The Graduate School

Donna Kain: English, Thomas Harriot College of Arts and Sciences

Margaret Pio: Research & Graduate Studies

Alan Skirnick: English Student, Thomas Harriot College of Arts and Sciences

Laura Taylor: Adult Education Student, College of Education

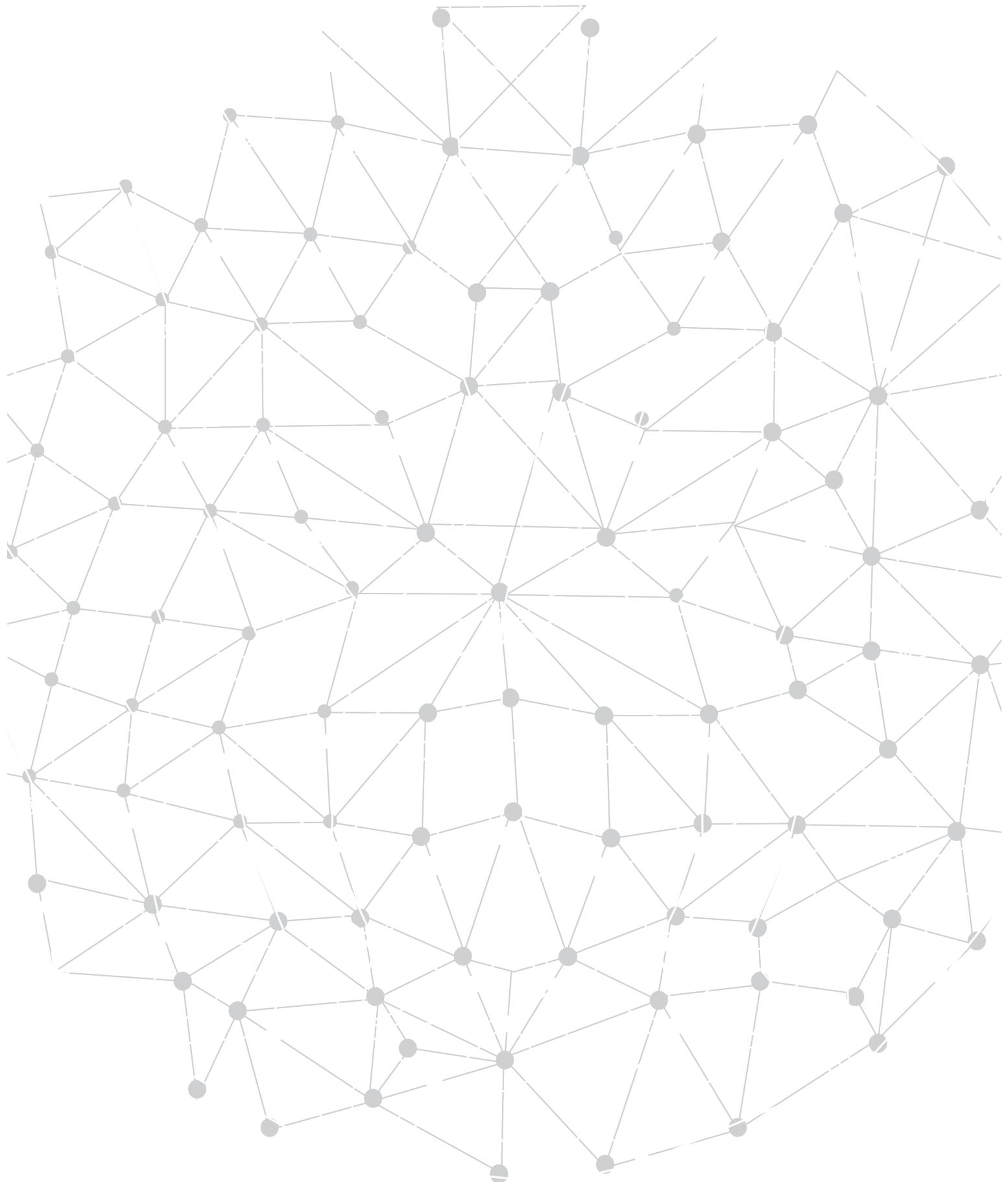
Joseph Wilck: Engineering, College of Technology and Computer Science

Guili Zhang: Special Education, Foundations & Research, College of Education

Technical Committee

Josh Brown, Tony Cooke, Wendy Creasey, Laurie Godwin, Derrick Isler, Charlie Justice, Matthew Powell, Ginny Sconiers, John Southworth

March Twenty-Third – March Twenty-Seventh	
Monday	MARCH TWENTY-THIRD 8:15 am – 5:30 pm Graduate Student Presentations Oral sessions in MSC Great Rooms I+2+3 Graduate Posters in MSC Social Room Graduate Posters in MSC 221 Graduate Posters in MSC Gallery 12:15 pm – 1:15 pm USPTO Patent Presentation MSC 244
Tuesday	MARCH TWENTY-FOURTH 9:00 am – 11:00 am Intersection of Arts and Sciences MSC 244 7:30 am – 12:00 pm Graduate Posters Posters taken down by 12 pm 10:00 am – 12:00 pm Postdoctoral Scholar Posters MSC Great Room 2 2:30 pm – 6:00 pm International Scholars Symposium MSC 244 6:30 pm - 8:30 pm Honors College Research Poster Showcase and Reception MSC Great Rooms
Wednesday	MARCH TWENTY-FIFTH 8:15 am – 4:00 pm Undergraduate Student Presentations Oral Sessions MSC Great Rooms I+2 Undergraduate Posters MSC Social Room Undergraduate Posters MSC 221 Undergraduate Posters MSC Gallery 4:00 pm – 6:00 pm Invited Faculty Research Lecture College of Education Faculty and Student Research Showcase MSC 244
Thursday	MARCH TWENTY-SIXTH 7:30 am – 3:00 pm Undergraduate Posters Posters taken down after 2 pm 12:00 pm – 1:15 pm Scholar-Teacher Luncheon (<i>Invitation Only</i>) MSC Great Rooms 2+3 1:30 pm – 3:15 pm Scholar-Teacher Symposium MSC Great Room I & MSC 244
Friday	MARCH TWENTY-SEVENTH 12:00 pm – 1:30 pm Student Awards Luncheon (<i>Invitation Only</i>) MSC Great Rooms I+2+3 RCAW Awards Thesis/Dissertation Awards ECU Distinguished Faculty Mentor Awards Excellence in Health Disparities Carol F. Volkman Recognition



Lectures & Symposia

College of Education Faculty and Student Research Showcase

ECU Scholar-Teacher Awards and Symposium

Global Issues Virtual Conference

Honors College Research Poster Showcase and Reception

International Scholars Symposium

Intersection of Arts and Sciences

USPTO Patent Presentation

College of Education Faculty and Student Research Showcase

Date: Wednesday, March 25, 2015

Time: 4:00 PM - 6:00 PM

Location: MSC 244

Presenters and Research Studies:

Faculty invited paper presentation (4:15-4:45):

Benjamin Blaisdell, Schools as racial spaces: Understanding and resisting structural racism

Faculty invited round table presentation (5:00-5:45):

Abbie Brown, 3D Printing in Instructional Settings: Identifying A Curricular Hierarchy of Activities

Christina Tschida, It Just Works Better: Introducing the 2:I Model of Co-Teaching in Teacher Preparation

Graduate student poster presentations (5:00-5:45):

The Effects of Background Music on Student Work
Catherine Bademian

The Effectiveness of Technology on Reading in the Classroom
Jennifer Burleson

Explicit Instruction vs. Student Led Learning Experiences
Kathryn V. Cayco

The Effects of Music in the Elementary Classroom
Audrey Dexter

Stability Balls in the Classroom – Does Usage Increase Student Achievement
Samantha Dinner

Best Small Group Reading Instruction Method for Upper Elementary: Guided Reading or Literature Circles?
Lauren Griffin

Math Notebooks: Should They Be Structured for 6th Grade?
Melinda Harrell

Project Based Learning: Does it Make Science Education Better?
Kelly Hylton

Thinking Maps and Latin Instruction
Kristin Justice

Multiplication Fact Fluency: Traditional Instructional Practices versus iPad/Web Based Applications
Lisa Howell Langley

Literature Based Instruction vs. Phonics in Isolation
Ashley Lynn

Does Integrating the Arts, Specifically Music, into the Math Class, Increase Student Performance?
Heather Marshall

Reading Comprehension Strategies
Blythe McGowan

Singapore Math: The Modeling of Word Problems
Tracy Lynn McIntyre

Tutoring to Improve Language and Grammar Skills
Kathy Robertson

Determining if the Use of Technology Has a Positive Effect on Math Fact Fluency and Automaticity
Kelsey Shue

Will K-2 Students Produce Higher Scores on Their DIBELS Reading Assessment if Tested in the Morning Versus in the Afternoon?
Jessica Stroud



2014-2015

ECU 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 Affairs

Thursday, March 26, 2015 – 12:00 – 3:30 - Mendenhall Student Center

The ECU Scholar-Teacher Award recognizes outstanding faculty members who integrate scholarship and teaching. Each year the colleges in Academic Affairs and colleges and schools in Health Sciences recognize one or more scholar-teacher(s), based on the number of faculty in the unit. During the symposium, each scholar-teacher provides a succinct presentation (approximately 15 minutes) concerning his/her integration of scholarship in teaching. Each recipient also develops a poster presentation or display for viewing during the symposium. This year two concurrent sessions will be held in the Mendenhall Great Room 1 and Room 244. Faculty, staff, students, and community friends are encouraged to attend all or parts of the afternoon symposium and to enjoy another wonderful celebration of scholarship and teaching at ECU!

2015 ECU Scholar-Teacher Awards and Symposium

12:00 -1:15 pm	Awards Presentation and Reception for Recipients and Invited Guests
1:30 – 3:30 pm	Presentations in Mendenhall Great Room 1 and 244
12:00 – 3:30 pm	Poster Display – Mendenhall Great Rooms

Great Room 1

Mendenhall 244

1:30	Dr. Kori L. Brewer <i>Associate Professor of Emergency Medicine</i> Brody School of Medicine <i>Scientific Certainty in Modern Medicine: Questioning the Unquestionable</i>	1:30	Dr. Lester Zeager <i>Professor of Economics</i> Thomas Harriot College of Arts and Sciences <i>Leading Students from Theory to Application</i>
1:50	Dr. Sonja K. Bareiss <i>Assistant Professor of Physical Therapy</i> College of Allied Health Sciences <i>Building a Better Clinician: Bridging the Gap Between Clinical Education and the Bench</i>	1:50	Dr. Rosana Nieto Ferreira <i>Associate Professor of Geography, Planning, and Environment</i> Thomas Harriot College of Arts and Sciences <i>Hooking Pirates on the Weather</i>
2:10	Dr. Derrick R. Wirtz <i>Associate Professor of Psychology</i> Thomas Harriot College of Arts and Sciences <i>Teaching Students to Do Research (And Love It): Creating Experiential Opportunities for Scholarship</i>	2:10	Dr. Rebecca G. Fay <i>Assistant Professor of Accounting</i> College of Business <i>I'm Not Biased, Am I? Enabling Students to Experience Research Findings Firsthand</i>
2:30	Dr. Ann M. Schreier <i>Associate Professor of Graduate Nursing Science</i> College of Nursing <i>Using Narratives to Teach Nursing Concepts</i>	2:30	Dr. Sergiy Vilkomir <i>Associate Professor of Computer Science</i> College of Engineering and Technology <i>Integration of Research and Teaching Activities in and out of Class</i>
2:50	Dr. Alice R. Richman <i>Assistant Professor of Health Education and Promotion</i> College of Health and Human Performance <i>Positively Impacting Public Health: The Synergy of Scholarship and Teaching</i>	2:50	Dr. William Sugar <i>Associate Professor of Mathematics, Science, and Instructional Technology Education</i> College of Education <i>Studies of Instructional Design Practices: Recent Research and Takeaways</i>
3:10	Dr. Natalia E. Sira <i>Associate Professor of Child Development and Family Relations</i> College of Human Ecology <i>Putting the Puzzle Together: Linking Medical and Psychosocial Determinants of Health</i>	3:10	Dr. Deborah Thomson <i>Associate Professor of Communication</i> College of Fine Arts and Communication <i>Performance Matters</i>

Together Creating International Understanding

Global Issues

Virtual Conference

powered by: Global Academic Initiatives, ECU and Krosno State College, Poland



Come Join Us!

March 23 - 27, 2015
Virtual Conference

For more information email
gpeglobalissues@ecu.edu



Państwowa Wyższa Szkoła Zawodowa
im. Stanisława Figorina
w Krośnie



The Global Issues Conference will facilitate student-centered discussions by students world-wide on a wide range of topics which impact young people and their futures across the globe.

Session Topics

- Language & Global Education
- International Business & Economics
- Global Film
- World Health
- Women's Issues Around the World
- Global Tourism & Leadership
- Human Rights & Children's Rights Worldwide
- Global Terrorism

The conference will operate online & enable faculty-sponsored undergraduate & graduate students from our Global Partners in Education (GPE) to deliver pre-prepared presentations & papers on the session topic.



East Carolina University

Honors College Research Poster Showcase and Reception Schedule of Events

In collaboration with East Carolina University's 9th Annual Research and Creative Achievement Week

Date: Tuesday, March 24, 2015

Time: 6:30 PM - 8:30 PM

Location: Mendenhall Student Center

6:30pm-7:15pm: Honors College Seniors in the PURPLE group present their Senior Honors Projects

Location: Social Room in Mendenhall Basement

7:15pm-7:45pm: Brief remarks, the announcement of the Honors College Outstanding Senior Honors Project (SHP) Mentor Awards and refreshments

Location: Mendenhall Great Rooms

7:45pm-8:30pm: Honors College Seniors in the GOLD group present their Senior Honors Projects

Three Locations: Mendenhall 221, Mendenhall Second Floor Gallery, and Mendenhall Great Rooms

Presenters

MSC Social Room

UPI. Sarah Christian
UP2. Hannah Leicht
UP3. Allison Wiles
UP5. Martha Ervin
UP9. Megan Hauser
UPII. Joshua Griffin
UPI2. Stephanie Wiafe
UPI3. Jason Workman
UPI5. Kelsey Weiss
UPI6. Michaela Atwell
UPI8. Meredith Edwards
UP21. Rebekah Carbone
UP24. Brendan Schachle
UP25. Kristen Martin
UP27. Michael Prunka
UP29. Kellie Baker
UP30. Sarah Horton
UP31. Lindsay Caddell
UP33. Christina Smith
UP34. Blaire Conner
UP35. Charles Jauss
UP38. Alix Rothbart
UP39. Georganna Gower
UP40. Shayna Meyers
UP41. Kali Harrison
UP42. Kristin Karas
UP43. Kimberly Bostick
UP44. Deepa Ramaswamy
UP45. Cathryn Simmons
UP46. Katie Pridgen
UP47. Jessica Firnhaber
UP49. Karina Dierolf
UP50. Nicole Rodgers
UP54. Andrew Geddes
UP55. Mary Smith
UP57. Kathryn Camilleri

MSC Great Rooms

HC1. Ajay Ajmera
HC2. Ryan Beeson
HC3. Payton Burnette
HC4. Destiny DeHart
HC5. Tyler Florio
HC6. Daniel Franch
HC7. Jordan Griffin
HC8. Meredith Haney
HC9. Amanda Higgins
HC10. Denver Hollingsworth
HC11. Jessica Jewell
HC12. Madaline Logan
HC13. Adrian Modzik
HC14. Shayna Mooney
HC15. Victoria Neff
HC16. Jessica Rassau
HC17. Phoebe Sullivan
HC18. Mansi Trivedi
HC19. Brandon Watson
HC20. Rachel Wells
HC21. Ellen Williams
HC22. Andrew Wood
HC23. Eva Zeron

MSC Room 221

UP92. Layne Barefield
UP93. Rana Abdel Salam & Alex Bryan
UP98. Sarah Sipe
UPI02. William Hayden
UPI07. Madelon Wygand
UPI13. Lea Taylor
UPI17. Teresa Heavilin
UPI19. Robert Kobet
UPI20. Ashley Brenna Owens

MSC Gallery

UP63. Thomas Vaughan
UP68. Kari Carr
UP69. Stephen Parker
UP72. William Cope
UP76. Elizabeth Bernetski
UP82. Bryan Anstead
UP88. Adeem Tahira

International Scholars' Symposium – 2015 Program

2:30 – 2:45 | Opening Remarks: Dr. Nehad Elsawaf, International Scholar Symposium chair and organizer.

Session 1: Session Chair – Dr. Nehad Elsawaf

2:45-3:00

Deja Que Yo Te Cuente and Vivir del Cuento: Cuban TV Sitcoms on the Island. Luci M. Fernandes, Ph.D and Sylvie Debevec Henning, International Studies program, Department of Anthropology, Global Understanding Program, ECU, Greenville, NC 27858

3:00-3:15

Anandamide induces apoptotic cell death in tumorigenic keratinocytes: Role of cyclooxygenase-2 and the novel cytotoxic metabolite, prostamide J2, Eman Soliman, Daniel Ladin, Allison Danell and Rukiyah Van Dross, Department of Pharmacology and Toxicology, Brody School of Medicine, East Carolina University, Greenville, NC, 27834

3:15-3:30

MucR, a prokaryotic zinc finger protein, is a potential candidate for the acid-responsive regulator of the genes encoding the ferrous iron-specific transporter FtrABCD in *Brucella abortus* 2308. Ahmed E. M. Elhassany and R. Martin Roop II, Department of Microbiology and Immunology, East Carolina University School of Medicine, Greenville, North Carolina 27834, USA

3:30-3:45

Endocannabinoid GPR18 Receptor Activation Confers Cardiovascular Protection in Diabetic Rats. Ahmed A. and Abdel-Rahman AA. Department of Pharmacology and Toxicology, East Carolina University, Greenville, NC, 27834.

3:45-4:00

Integrating Mini-lab Demonstrations to Classroom Lectures in Undergraduate Engineering Teaching, Yuqiang Jiang and Jason Yao, Department of Engineering, East Carolina University, Greenville, NC, 27858

4:00 PM - 4:15 PM | BREAK

Session 2: Session Chair – Dr. Nehad Elsawaf

4:15- 4:30

Exploring the value of weekend camp participation among school age children and teenagers with complex heart defects: A phenomenological study. Priti P. Desai, PhD, MPH, CCLS and Sarah McEarl, Child Development and Family Relations Department, College of Human Ecology, East Carolina University. Lori Jo Sutton, AAS, CCRC, and David W. Hannon, MD, Pediatric Cardiology, Department of Pediatrics, Brody School of Medicine, East Carolina University, Greenville, NC, 27834

4:30-4:45

The Comparative Study of Hotel Brand Building of U.S. and China. Dongxia Luo, Ph.D., Visiting Scholar, and Robert M. O'Halloran, Ph.D., Professor & Director, School of Hospitality Leadership, College of Human Ecology, ECU School of Hospitality Leadership, College of Human Ecology, East Carolina University, Greenville, NC, 27858

4:45-5:00

Submerged Aircraft Archaeology and Site Formation Studies in Tanapag Lagoon, Saipan. James R. Pruitt, Master's Candidate, Program in Maritime Studies, East Carolina University, Greenville, NC, 27858

5:00-5:15

Mirror and Window: A Self Study about Literacy Practice and Curriculum in China and the United States. Ran Hu and Qian Wang, Department of Literacy Studies, English Education and History Education, East Carolina University, Greenville, NC, 27858

5:15-5:30

"A good well demanding a mouth as entry" Analysis of A Piece of Metaphor about Preparing Lessons, Qian Wang, Department of Special Education, Foundations, & Research, East Carolina University , Greenville, NC, 27858

5:30-5:45

Transmitted Drug Resistance in Treatment Naïve HIV Patients. Ahmed Abubaker, MD, Department of Internal medicine, Brody school of medicine at East Carolina university; Xiangming Fang PhD, Department of Biostatistics, East Carolina University and Nada Fadul, Department of Internal medicine, Brody school of medicine at East Carolina university Greenville, NC, 27858.

5:45-6:00

Concluding remarks

Intersection: Arts@Science

HOSTED BY THE COLLEGE OF FINE ARTS AND COMMUNICATION

Date: Tuesday, March 24, 2015

Time: 9:00 AM – 11:30 AM

Location: MSC 244

WELCOME TO THE INTERSECTION: We know that art, in and of itself, has intrinsic value. Perhaps Intersection: Arts @ Science illuminates scientific research in the service of art, unveils creative activity that inspires scientific breakthrough, or showcases novel solutions found through cross-disciplinary partnerships. Our purpose is to celebrate collaboration, recognize interdisciplinary initiatives and investigate the arts as they inspire innovation in the sciences. The Intersection also explores biomechanic research in the service of ballet dancers, the consideration of Incan art and architecture as scientific tools, using sculpture to enhance theatre education and more.

I Lie Awake: A dance performance piece using scientific concepts to create movement and explore the interaction between verbal and non-verbal communication in regard to pain

BFA/BS candidate Kristalyn Gill, School of Theatre and Dance, with Chloe Ament, Hailey Bates, Nichesa Jones, Bridgett Taylor

Leveraging new media and prosumer gear to distribute content such as the doc-in progress “That’s My Girl.”
Erick Yates Green, Assistant Professor, School of Art and Design, with students Audra Entzi, Marquell Deiournett, Maia Swan, Chanel Wang, Kevin Terrell and Connor Mangold

Golden LEAF Advanced Manufacturing and Innovation Academy

Wayne Godwin, Associate Professor, School of Art and Design

North Carolina NewMusic Initiative: Comprehensive composing and commissioning
Edward Jacobs, Jones Distinguished Professor, School of Music

Investigating Ancient Textile Technologies Using Modern Scientific Methods and Contemporary Crafting Knowledge

Laura Mazow, Assistant Professor, Thomas Harriot College of Arts and Sciences

A Colony Lost: An interdisciplinary research project culminating in a made-for-PBS documentary

BFA candidate Mackenzie Smith, School of Art and Design

Serving the Community through Arts Education at the Third Street Community Center

Jeffrey Ward, Associate Dean of Assessment, College of Fine Arts and Communication

A Deeper Meaning through the Practice of Making

Gerald Weckesser, Wood Shop Supervisor, School of Art and Design

Presenter order subject to change. No talk lasts longer than 12 minutes.

USPTO Patent Presentation

United States Patent and Trademark Office

Date: Monday, March 23, 2015

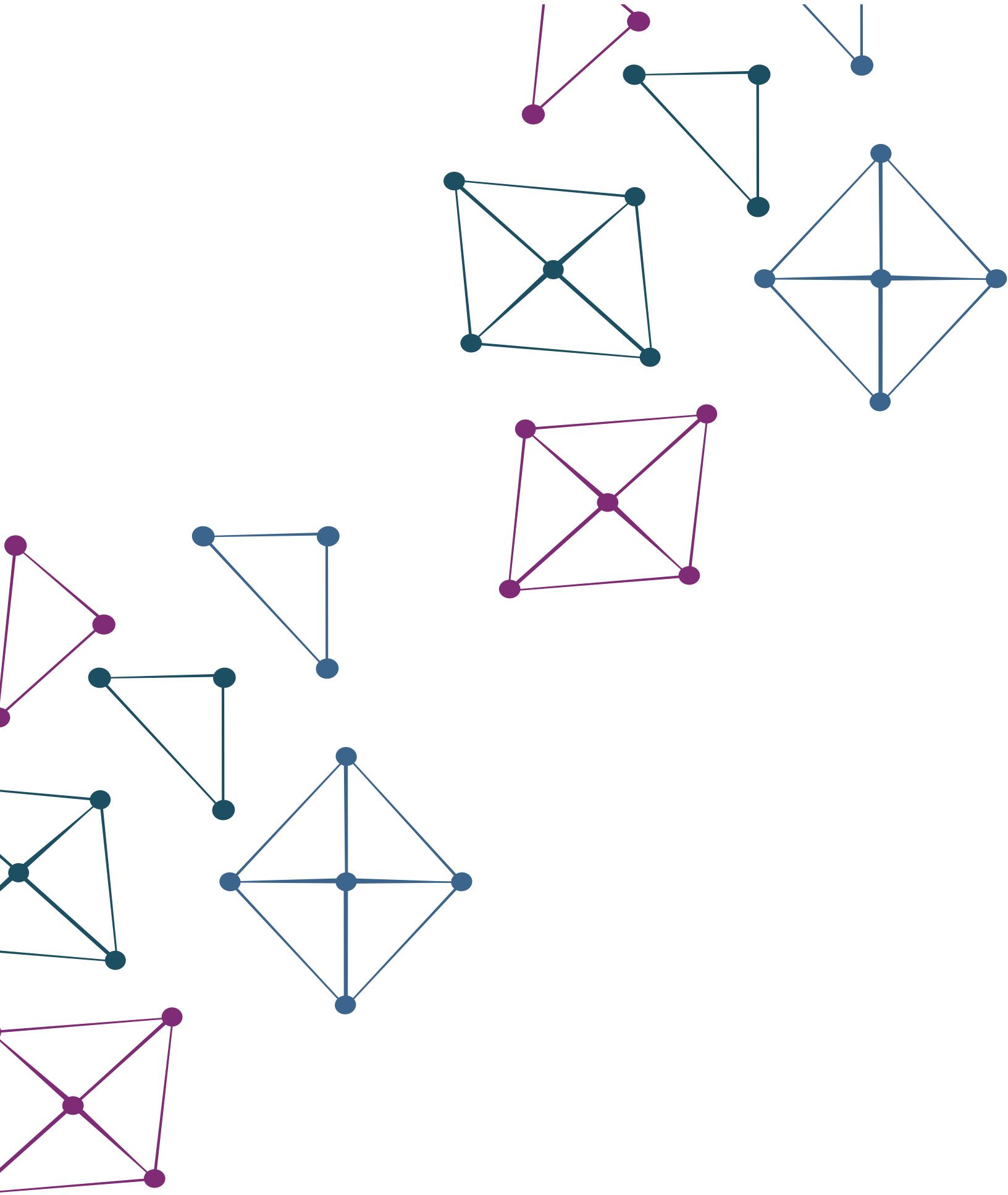
Time: 12:15 PM – 1:15 PM

Location: MSC 244

Intellectual Property: How To Protect Your Invention Ben Fetterolf

On Monday, March 23rd, Brandon Fetterolf, patent examiner with the United States Patent and Trademark Office, will give a presentation on the basics of intellectual property protection (copyrights, patents, trademarks and trade secrets). He will provide real life examples and describe how each type of protection applies to the work of an engineer or scientist.





Mentor List

Abdel-Rahman, Abdel-Rahman	Ewen, Charles R	Lim, Kwang Hun	Ryan, Teresa Jean
Ables, Elizabeth Tweedie	Farwell, Mary	Linn, Jimmy B	Sanders, Janet H
Aeby, Victor G	Ferreira, Rosana Nieto	Littlewood, Kerry	Sargent, Andrew
Agarwala, Ranjeet	Frost, Erin Anne	Love, Brian	Scemama, Jean-Luc
Allen, Thomas R	Funai, Katsuhiko	Lu, Qun	Selim, Mustafa I
Ardon-Sayaو, Marcelo	George, Stephanie	Luczkovich, Joseph John	Shaikh, Saame Raza
Avenarius, Christine Benita	Geyer, Christopher	Lyndon, Amy E	Smirnova, Olga Victorovna
Averett, Paige	Given, John P	Maher, Derek F	Soderstrom, Kenneth M
Aziz, Shahnaz	Goldberg, Daniel	Mansfield, Kyle David	Spuches, Anne M
Babatunde, Oyinlola Toyin	Golden, Jean Ann	May, Linda Elizabeth	Stuart, Andrew
Baker, Michael Drew	Goodwillie, Carol	Mazow, Laura B	Summers, Kyle
Balanay, Jo Anne Goot	Gordon, Sharon M	McCabe, Richard Dennis	Swaggerty, Elizabeth A
Bardill, Jessica Dawn	Greer, Annette G	McClung, Joseph Matthew	Tanner, Charles Jonathon
Bareiss, Sonja Karin	Griffith, David Craig	McCoy, Krista Ann-Marie	Thomassen, Mary J
Bean, Eban Zachary	Gross Mcmillan, Amy	McMillen, Brian A	Thompson, Beth
Behm, Michael G	Gustafson, Christine	McRae, Susan B	Torres, Essie Talina
Bell, Paul D	Harcourt, Kate Taylor	Meardon, Stacey Augusta	Tran, Tuan D
Bickley-Green, Cynthia Ann	Harris, Michael Lee	Mercer, Calvin R	Tucker-McLaughlin, Mary
Boudreaux, Edmond Anthony	Hattingh, Johannes Hendrik	Miles, Jane Marie	Tulis, David Anthony
Brault, Jeffrey John	Hegde, Archana	Mitchell, Linda C	Twardy, Charles A
Brewer, Michael Scott	Hernandez, Richard L	Moll, Kevin N	Valrie, Cecelia R
Bridges, Lance	Hickner, Robert Charles	Morin, Aysel	Van Dross, Rukiyah
Burns, Colin S	Houmard, Joseph A	Morris, Jonathan S	Van Scott, Martha J S
Cabot, Myles Clayton	Howard, John W	Muller-Borer, Barbara J	Vance Chalcraft, Heather D
Carpenter-Aeby, Tracy	Howard, William	Murashov, Alexander K	Verbanac, Kathryn
Carraway-Stage, Virginia G	Hu, Xin-Hua	Mwachofi, Ari K	Vermiglio, Andrew J
Carson, Jamin	Huener, Thomas Joel	Nalavany, Blace A	Wall-Bassett, Elizabeth DeVane
Castles, Ricky Thomas	Huo, Shouquan	Nassehzadeh-Tabrizi, Moha	Walsh, John P
Caswell, Nicole Irene	Hvastkovs, Eli Gerald	Neufer, Peter D	Warner, Stacy M
Chalcraft, David R	Issa, Fadi Aziz	O'Driscoll, Michael A	Wentz, Laurel McLean
Chambers, Crystal Renee	Jackson, Andrew E	Oliver, Jason D	Wheeler, Michael D
Chen, Yan-Hua	Jackson, Mary S	Palmer, Leonard E	Wilburn, Kenneth Elwood
Chin, Robert A	Jenkins, Walter L	Pan, Xiaoping	Wilck, Joseph Hubert
Christensen, Timothy W	Jolls, Claudia L	Peralta, Ariane Legaspi	Williams, Richard S T
Clay, Maria Castillo	Jones, Elizabeth Ann	Perry, Megan A	Willson, John David
Clemens, Stefan	Jones, Terry E	Pickard, John L	Willy, Richard William
Collier, David N	Jordan, Debra	Pitts, Stephanie Bell Jilcott	Wingard, Christopher J
Corbett, David R	Jung, Jae Won	Popke, Emil Jeffrey	Wirtz, Derrick
Cortright, Ronald N	Kane, Melinda D	Prividera, Laura C	Witzak, Carol
Cox, Kathleen Treole	Kang, Jin-Ae	Qi, Yiping	Woods, Terri L
Crawford, Alleah M	Katwa, Laxmansa C	Raedike, Thomas D	Wright, Heather Harris
Culver, Stephen J	Kennedy, Anthony M	Ratcliff, Gail L	Wuensch, Karl L
Daniel, Isaac Randolph	Kim, Juhee	Richards, Stephanie Lynn	Xue, Yajiong
Darkenwald, Teal	Kimmel, David	Richman, Alice Rose	Yang, Li
DeVita, Paul	Knight, Sharon M	Rickenbach, Thomas M	Yang, Yu
DeWitt, Regina	Knudson, Cheryl B	Rider, Patrick Michael	Yao, Jianchu
Dickerson, Anne	Knudson, Warren	Rigsby, Catherine Ann	Zeczycki, Tonya N
Dlugonski, Deirdre Marie	Lamson, Angela Lynn Smith	Rodriguez, Art	Zemanek, James E
Dolbier, Christyn	Larson, Kim L	Roop, Roy M	Zhang, Baohong
Duffrin, Melani	Lea, Cary Suzanne	Roper, Rachel L	Zhu, Yong
Elhammoumi, Cheryl Vinyard	Lemasson, Isabelle	Rose, Jaya	
Engelke, Martha K	Leorri Soriano, Eduardo	Rulifson, Roger A	

Graduate Oral Presentations

MSC Great Room I Natural Sciences			8:15 am — 12:00 pm
GO1	8:15-8:30	Reproductive plasticity in a winter annual plant, Lauren Colbert	
GO2	8:30-8:45	Effects of Disturbance and Nutrient Availability on the Composition and Diversity of Soil Microbial Communities, Joshua Thigpen	
GO3	8:45-9:00	Critical Biological Knowledge for Conservation of the Federally Endangered Herbaceous Plant, <i>Thalictrum cooleyi</i> Ahles, Amanda Fortner	
GO4	9:00-9:15	Southeast U.S. Precipitation Changes in a Warmer Climate, Mark Nissenbaum	
GO5	9:15-9:30	Elevated prenatal hormones program autism-like behavior in the rat, Bevin Blake	
GO6	9:30-9:45	Visitation by native insects to a threatened Great Lakes dune endemic plant is not affected by an organic kaolin clay insect deterrent, Jaclyn Inkster	
GO7	9:45-10:00	Climatic challenges to the reproductive success of a threatened, secretive marshbird, the king rail (<i>Rallus elegans</i>), Amanda Clauser	
	10:00-10:15	BREAK	
GO8	10:15-10:30	Rapid Assessment of Submerged Aquatic Vegetation using SONAR and Underwater Video in Albemarle Sound, North Carolina, Hilde Zenil	
GO9	10:30-10:45	To what extent do larval predators affect the morphology and performance of juvenile toads?, Scott Jones	
GO10	10:45-11:00	Does nanoclay technology adversely affect aquatic biota relative to natural nanoclays?, Suelen Demor	
GO11	11:00-11:15	A Multi-Hazard Evaluation of Vulnerability using GIS along Cape Hatteras National Seashore, NC, Michael Flynn	
GO12	11:15-11:30	MucR, a prokaryotic zinc finger protein, is a potential candidate for the acid-responsive regulator of the genes encoding the ferrous iron-specific transporter FtrABCD in <i>Brucella abortus</i> 2308, Ahmed Elhassanny	
GO13	11:30-11:45	Needs Assessment of Coastal Land Managers for Drought Indicators in the Southeastern U.S., Casey Nolan	
GO14	11:45-12:00	Chemically Synthesized Endocannabinoids as Potential Anti-Cancer Agents, Andrew Morris	

Graduate Oral Presentations

MSC Great Room 2 | Biomedical Sciences

8:15 am — 12:30 pm

- GO15 8:15-8:30 Retinoic acid (RA) Regulates Kit translation in Prospermatozoa in the Neonatal Testis: A Novel Non-genomic Mechanism of RA-regulated Gene Expression, Jonathan Busada
- GO16 8:30-8:45 Structural Investigation of Pathogenic Transthyretin Amyloids using Solid-State NMR, Anvesh Dasari
- GO17 8:45-9:00 Defining a Novel Role for Noncatalytic Enzymes, Jason Hoggard
- GO18 9:00-9:15 MicroRNAs Targeting PPAR Pathways are Elevated in Bronchoalveolar Lavage (BAL) cells from Sarcoidosis Patients and from Mice Bearing Carbon Nanotube Induced Granulomas , Matthew McPeek
- GO19 9:15-9:30 The Role of Dicer in the Restorative Macrophage Phenotype, Sherri Moore
- GO20 9:30-9:45 Human T-cell leukemia virus type I bZIP factor (HBZ) inhibits the transcriptional activity of the tumor suppressor p53, Diana Wright
- GO21 9:45-10:00 Retinoic acid (RA) does not increase the stability of repressed mRNAs during spermatogonial differentiation, Ellen Velte
- GO22 10:00-10:15 AEA Metabolite, 15d-PGJ -EA, Induces Apoptosis and Endoplasmic Reticulum Stress in Skin Cancer Cells, Daniel Ladin
- 10:15-10:30 BREAK
- GO23 10:30-10:45 The Pentose Phosphate Pathway is Stimulated by Constitutively Active Ca²⁺/Calmodulin-Dependent Protein Kinase Kinase (CaMKK) in Mouse Skeletal Muscle, Jeremie Ferey
- GO24 10:45-11:00 The tumor suppressing function of TDAG8 in the acidic tumor microenvironment in lymphoma cells, Edward Sanderlin
- GO25 11:00-11:15 Fast and accurate portal image prediction by Monte Carlo simulation for a clinical linac, JiHyung Yoon
- GO26 11:15-11:30 Interleukin-6 Secretion of Human Skeletal Muscle of Lean and Obese Populations, Ashleigh Israel
- GO27 11:30-11:45 Activation of the Prostanoid EP3 Receptor Mediates Central Nicotinic Acid-Evoked Pressor Response in Conscious Rats, Samar Rezq
- GO28 11:45-12:00 Rho GTPase Signaling: A Neuroprotective Target for Attenuating Chemotherapy-Induced Peripheral Neuropathy, Yi Zhu
- GO29 12:00-12:15 Mitochondrial Respiration is Attenuated in the Ischemic Muscle of Genetically Susceptible Mice, Cameron Schmidt
- GO30 12:15-12:30 PRESENTATION WITHDRAWN

Graduate Oral Presentations

MSC Great Room 3 | Fine Arts

8:15 am — 3:30 pm

GO31	8:15-8:30	Animal Instinct, Dru Patrick
GO32	8:30-8:45	Jazz on broadway, Gregory Bailey
GO33	8:45-9:00	A Cycle of Prints and Enamelled Jewelry, Sarah Loch-Test
GO34	9:00-9:15	Love Story Between An Artist And A Hunch, Amber Watts
GO35	9:15-9:30	The Self, Gregory Banks
GO36	9:30-9:45	Muslim Women in Western Context, Abir Abumohsen
GO37	9:45-10:00	Fresh Tracks, Joseph Mannino
	10:00-10:15	BREAK
GO38	10:15-10:30	“How to Lose Yourself in 10 Days”, Alexandra Ingle
GO39	10:30-10:45	“Beyond Anatomy in Figurative Sculpture”, Chris Morgan
GO40	10:45-11:00	Letter of the Law: A Study of Biblical Holiness Code and Its Application to Modern Life, Hosanna Rubio
GO41	11:00-11:15	Methods of Communication, Christine Zuercher
GO42	11:15-11:30	Ceramic Design for Social Serving Ware, William Bailey
GO43	11:30-11:45	A Family Scattered: Rejoining the Disjointed, Sarah Harvell
GO44	11:45-12:00	Rape Culture, Alyssa Karpa
	12:00-1:30	BREAK
GO70	1:30-1:45	A Photographic Investigation of “The Great Train Robbery” of 1903, Addison Brown
GO71	1:45-2:00	The Art and Traditions of Mourning and Sentimental Jewelry, Barbara McFadyen
GO72	2:00-2:15	Democratized Technologies in Studio Practice, Devin Mckim
GO73	2:15-2:30	Creative process : ssecorp evitaerC, Brett Beasley
GO74	2:30-2:45	Humans are social [media] creatures, Andrew Wells
GO75	2:45-3:00	Multi-Layered Conversations, Sarah Hooper
GO76	3:00-3:15	Rejuvinating Effects of Nature-Inspired Art, Emily Branch
GO77	3:15-3:30	Ceramic Raku Firing Method and a Collaborative Kiln Building Project, Erin Younge

Graduate Oral Presentations

MSC Great Room I | Social Sciences

1:30 pm — 5:30 pm

GO45	1:30-1:45	Anthropology and Technology: How Can Cultural Heritage Digitization Increase the Publics' Understanding of the Past, Hannah Rawcliffe
GO46	1:45-2:00	Hybrid Health: An Analysis of a Foundations Curriculum Personal Health Course, Johnny Signorelli
GO47	2:00-2:15	Callous-Unemotional Traits and Salivary Oxytocin in Maltreated Adolescents and Young Adults, Emmi Scott
GO48	2:15-2:30	Early Childhood Administrators' Attitudes and Experiences in Working with Gay and Lesbian Families., Julie Church
GO49	2:30-2:45	Exploring the Attitudes and Behaviors of African American Tourists, Charis Tucker
GO50	2:45-3:00	Surviving the Mean Girls: Relational Aggression in the Workplace, Courtney Sparks
GO51	3:00-3:15	Agrarian Transition: Greenhouse farming technology and the production of new farmer identity in Jamaica, Alex Moulton
	3:15-3:30	BREAK
GO52	3:30-3:45	Gender Differentiation in Jewish Memorials: An Ethnoarchaeological Examination of the Headstones in the B'nai Israel Cemetery, Simon Goldstone
GO53	3:45-4:00	Relationships Among Cohesion and Performance, Anxiety, Retention, and Satisfaction, Arden Anderson
GO54	4:00-4:15	Evaluation of Anti-fat Biases in Kinesiology Students and the Impact of Participating in Project Mentor on Implicit and Explicit Attitudes, Taylor Calamese
GO55	4:15-4:30	North Carolina health director and county commissioners' perception of 'winnability' of local food- related obesity prevention policy change strategies, Leigh Cunius
GO56	4:30-4:45	The Role of Religious Values: Young Christians' Opinions towards Tattoos, Rachel Johnson
GO57	4:45-5:00	Visual Representations in AAC Technologies and Teaching Art to Learners with Complex and Profound Disabilities, Nicole Allen
GO58	5:00-5:15	The Impact of Parent PLUS Loan Policy Revisions on Historically Black Colleges and Universities, Elizabeth Coghill
GO59	5:15-5:30	The Effect of Teacher Mediated Vocabulary Discussions During Read Alouds, Leanne Radabaugh

Graduate Oral Presentations

MSC Great Room 2 | Humanities

1:30 pm — 3:00 pm

GO60	1:30-1:45	Music and Movement: Dance and the Liberation of the French Aria, Hannah Riddle
GO61	1:45-2:00	Minuten Fun Betochen: The Correlation Between the Music of Mordecai Gebirtig and Life for Jews in Poland from c. 1900-1942, Kate Oliphant
GO62	2:00-2:15	THE COMPOSITIONAL STYLE OF TWO EARLY BAROQUE COMPOSERS: INNOVATION AND EMERGING TONALITY IN POLYPHONIC VOCAL MUSIC AT THE TURN OF THE 17TH CENTURY, Kimberly Ness
GO63	2:15-2:30	Investigations into the Oldest Standing Structure in North Carolina, Coy Idol
GO64	2:30-2:45	The Rise of the Fitbit: Body-Monitoring as Habit, Addiction, and Motivation, Christina Rowell
GO65	2:45-3:00	Cemetery Rhetoric: A Visual and Textual Lens for Understanding the Past, Suzan Flanagan

MSC Great Room 2 | Technology and Computer Science

3:15 pm — 4:15 pm

GO66	3:15-3:30	Finite Element Modeling of the Velopharyngeal System, Anish Sana
GO67	3:30-3:45	Predicting Website Usability, Venkata narsimha reddy Chintalapani
GO68	3:45-4:00	Indoor Path Finding via drones, Hooman Hedayati
GO69	4:00-4:15	Quality of IPv6 Enablement of Universities: An International Study, Annie Patrick

Graduate Poster Presentations

MSC Social Room | Human Health

8:15 am — 10:15 am

- GP1 Specific Responses to Denervation Atrophy Differ By Mouse Strain, Javid Hakimi
- GP2 Comparison of Local Public Health Agency Structure in North Carolina and Health Outcomes, Matilene Osho
- GP3 Speech in Noise, Outer Hair Cell Function, and Working Memory for Trained Flute Players, Kelly Caldwell
- GP4 LOWER BODY BILATERAL WORK ANALYSIS OF IN-STEP SOCCER KICKING, Kayla Seymore
- GP5 A COMPARISON OF SKIPPING AND RUNNING BIOMECHANICS AND METABOLIC COST: A THESIS PROPOSAL, Jessica McDonnell
- GP6 The effect of stride length on patellofemoral and tibiofemoral joint contact forces while running, Collin Bowersock
- GP7 Improving Discourse: A Novel treatment for Adults with Aphasia, Nicole Frisco
- GP8 PRESENTATION WITHDRAWN
- GP9 Uncertainty in Qualitative Analysis and Risk Rating System: Modeling Decision-Making Determinant, Ogaga Tebehaevu
- GP10 Assessing African Americans' Knowledge of Heart Disease and Stroke Symptomatology in North Carolina, Taylor Porter
- GP11 Experience, Executive Functioning, and the Environment: An Analysis of Factors that Impact Scanning Ability, Stephanie Biggs
- GP12 Noise Exposure Assessment among Groundskeepers: A Pilot Study, Adam Mannarino
- GP13 The Effects of Running Speed per Unit Distance on Total Load of the Lower-Extremities, Kayla Murphy
- GP14 Driving performance while wayfinding on-road and in an interactive driving simulator, Lauren Cochran

Graduate Poster Presentations

MSC Social Room | Human Health cont.

10:15 am — 12:15 pm

- GP15 Postural Responses to Perturbations in People with Diabetic Neuropathy, Matthew Becker
- GP16 Health Literacy among Pregnant Women at an Academic Obstetrics Clinic in Eastern North Carolina, Madison Preib
- GP17 Is Breastfeeding Really How It Seems: A Look at Breastfeeding Perspectives and Practice amongst Low Income Mothers in Pitt County, Tiffany Thigpen
- GP18 Lesbian, Gay, Bisexual & Transgender (LGBT) Health Care Concerns, Glee Dunbar
- GP19 The Bear Is Catching Up, Let's Run Faster, Daniel Schuster
- GP20 Nonprofit Hospitals' Community Benefit Spending: Evidence from NC Nonprofits, Melanie Morgan
- GP21 EFFECTS OF BODY MASS DISTRIBUTION ON CLINICAL MEASURES OF BALANCE IN ADOLESCENT FEMALES, Tamara Bivins
- GP22 Kinematic Predictors of Tibiofemoral Joint Contact Forces During Running, Amir Sani
- GP23 3D Predictors of Patellofemoral Joint Contact Forces in Healthy Individuals, Jennifer Warren
- GP24 BONE LOADING ACTIVITY AND RUNNING RELATED STRESS FRACTURE, Zachary Blank
- GP25 Single-Leg Squat Mechanics: Differences Among People With and Without ACL Reconstruction, and Association with Running Mechanics, Stephen Waggoner
- GP26 Cumulative Knee Joint Loads as a Function of Running Speed Among People with and without Anterior Cruciate Ligament Reconstruction, Meredith Hayek
- GP27 The Influence of ACL Reconstruction Surgery on Frontal and Sagittal Plane Motion at the Knee During a Single Leg Landing from a Jump, Elisabeth Flannery
- GP28 EFFECTS OF OBESITY ON SIX-MINUTE WALK TEST IN ADOLESCENTS, Kelsey Leondard
- GP29 Factors Correlated with Between-Limb Tibiofemoral and Patellofemoral Joint Load Asymmetry Following Anterior Cruciate Ligament Reconstruction, Vaughn Price
- GP30 Navicular Drop and Tibial Mechanical Axis: Relationship with Running Mechanics Associated with Tibial Stress Fracture, Emily Brown
- GP31 ¿UNIDA PERO DIVIDIDA?: A QUALITATIVE ANALYSIS OF DISPARITIES IN ACCESS TO HEALTHCARE BETWEEN PREGNANT DOMINICAN AND HAITIAN WOMEN LIVING IN THE DOMINICAN REPUBLIC, Tierra Simmons

Graduate Poster Presentations

MSC Social Room | Natural Sciences

12:30 pm — 2:30 pm

- GP32 A HOLOCENE PALEOCLIMATE RECONSTRUCTION OF THE SUNDA SHELF (SOUTH CHINA SEA), PENINSULAR MALAYSIA, Haley Hindes
- GP33 Physiological Responses of Anuran Larvae to Predation Cues, Richard Trone
- GP34 Distribution and taxonomy of modern benthic foraminifera of the Sunda Shelf (South China Sea), Peninsular Malaysia, Samuel Martin
- GP35 The maize male sterile fuzzy tassel mutant makes abnormal stamens that fail to produce mature pollen., Sterling Field
- GP36 Quantitative study of 3D morphology of MCF-7 cells in different stages of apoptosis, Zhan Chen
- GP37 Radiation and the Survival of Ancient Life, Colleen Kelleher
- GP38 Using Geostatistics to Characterize the Heterogeneity of a Karst Aquifer, Jonathan Prevatte
- GP39 Source Rock Characterization of the Point Pleasant Formation, in Washington County, Ohio, Scott Brinkley
- GP40 Seasonal Nitrogen Dynamics of Packaged Wastewater Treatment Plants in Coastal North Carolina, Robert Mahoney
- GP41 Seismic Stratigraphy of the Amazon Basin: Cenozoic Landscape Evolution of the Central Brazilian Amazon, James Wagner
- GP42 Characterizing the Surficial Aquifer of a Barrier Island, Bogue Banks, North Carolina, James Owers
- GP43 Holocene Paleoclimatic Evolution of the East Asian Monsoon on the Inner Sunda Shelf, Malaysia, Cameron Whitley
- GP44 Delineating Wastewater Contaminant Plumes from On-Site Wastewater Systems using Electromagnetic Induction in the North Carolina Coastal Plain, Adam Trevisan
- GP45 Estimation of Out-Of-Field Dose using Whole Body Computational Phantoms, Christopher Pelletier
- GP46 Markov Chains, Random Walks, and Card Shuffling, Nolan Outlaw
- GP47 Origin and geochemical evolution of localized, high-ferrous-iron zones in the Upper Castle Hayne Aquifer, Beaufort County, North Carolina, Mark Akland
- GP48 The Role of the Mid-latitude Upper Level Trough in Extra-Tropical Transitioning Hurricanes, Nicholas Luchetti
- GP49 Understanding the Relationship between the Taghanic Unconformity and Marcellus Shale Production in Doddridge and Richie Counties, West Virginia., Emily Adams
- GP50 Characterization of miR319-Regulated TCPs in Maize Inflorescence Development, Katherine Novitzky

Graduate Poster Presentations

- MSC Social Room | Natural Sciences cont.** 12:30 pm — 2:30 pm
- GP51 Connecting Modern Back-Barrier Island Deposits to Storm Records using Meteorological Data from the Outer Banks, NC, Nicholas Kelly
 - GP52 Back barrier erosion and hydrodynamic forces define deposition and accretion potential for Hatteras Flats, Rodanthe, NC., Christopher Cornette
 - GP53 Effects of hydroperiod and predator phenology on the cost of induced defenses in tadpoles, Alyssa D'Alessandro
 - GP54 Evaluating sedimentation rates in tidal marshes across a tidal range gradient along the southeastern United States, Luke Stevens
 - GP55 Digital Signal Processing using the Discrete Haar Wavelet Transform, Kenneth Chilcoat
 - GP56 Effects of Hypoxia on Age 0 Striped Bass and River Herring, Shelby White
 - GP57 DIRECT AND INDIRECT EFFECTS OF SALINITY ON AQUATIC METABOLISM IN A NORTH CAROLINA COASTAL WETLAND, Tori Goehrig
 - GP58 Synthesis, Structures and Photophysical Properties of Phosphorescent Cyclometalated Platinum Complexes., Robert Mroz

- MSC Gallery | Social Sciences** 8:15 am — 2:30 pm
- GP59 Parenting Diabetic Kids, Amelia Muse
 - GP60 Spatial Distribution of Plow Zone Ceramics at Town Creek, Marianne McGinn
 - GP61 An Exploration of Collegiate Outdoor Recreation Professionals' Personality Traits and Job Task Affect, Brittany Turnis
 - GP62 Examining the Adoption of National School Lunch Program Amendments in North Carolina, Olivia Whitt
 - GP63 Knowledge of water quality among different cultural groups: Insights towards improved citizen science projects and education campaigns, Michael Smith
 - GP64 Beyond the Pictures: Discourse Treatment Following TBI, Morgan Andrews
 - GP65 Sex Trafficking: The Perceived Support for Victims in Cusco, Peru, Vanessa Dorismond
 - GP66 HIE implementation in North Carolina, Mengyuan Farley
 - GP67 Mental Health Stigma and Literacy in Integrated Care, Ashley Tucker
 - GP68 Workaholism and Workplace Incivility: The Role of Stress and Psychological Capital, Lauren Lanzo

Graduate Poster Presentations

MSC Gallery | Social Sciences cont.

8:15 am — 2:30 pm

- GP69 Comparing Workplace Bullying Policies in the US and Abroad, Anna Casteel
- GP70 Dysgraphia, impact on an individual's sense of self throughout the life-course: A Systematic Review, Logan Keziah
- GP71 The Temporal Puzzle: Reconstructing the Culture History of the Multicomponent Site Squires Ridge, Terry Barbour
- GP72 Raising an Exceptional child: Attachment, Parental Stress and Coping in Adoptive Parents, Biancas Smith
- GP73 CAT Paths: Fair Route Productivity Standards, Margaret Bizzell
- GP74 Local Ecological Knowledge about Climate Change among Anglers in the Southeastern United States, Elizabeth Brown-Pickren
- GP75 Stress, Physical Activity, and Psychological Outcomes among Military Spouses, Autumn Palmer
- GP76 The Effect of Conservation Treatments on Organic Residues in Archaeological Ceramics, Sophia Carman
- GP77 Osteoporosis Knowledge and Health Beliefs in Middle-Aged Men: The need for intervention, Susan Marquez
- GP78 A Comparative Analysis of a Potential Tavern Site in Jackson, North Carolina, Katherine Thomas
- GP79 Couple Quality, Parent-Child Relationships and Parenting Efficacy of Incarcerated Individuals, Brooklyn Corbett
- GP80 How Media Representations of African American Women Impact the Body Image and Sexual Health of African American Teenage Girls, Crystal Stroman
- GP81 Self-management behaviors and social support for African American Women Caregivers with Type 2 Diabetes Mellitus, Sohale Vu
- GP82 Effects of Instruction Method on Vital Capacity and Maximum Sustained Phonation in Adult Male Controls, Cara Julian
- GP83 Importance of Mathematics Practice in Food and Nutrition Science Education, Sarah Sykes
- GP84 The Phelps Canoes: Testing Retreatment Strategies on Sucrose-treated Wooden Objects, Michell Gilman
- GP85 The Youth Public Arts Program: Interpersonal and intrapersonal outcomes for at-risk youth, Christina Hall
- GP86 Feeding the city: Isotopic reflections of diet at 1st century Petra, Jordan., Laurel Appleton
- GP87 Clubhouse Program for At-Risk Youth in West Greenville: Exploring the Impact of Peer, Home, and School Self-Esteem, Susan Tapp
- GP88 Isotopic evidence for the origins of homicide victims from Qasr Hallabat, Kathryn Parker

Graduate Poster Presentations

MSC Room 22I | Biomedical Sciences

8:15 am — 2:30 pm

- GP89 Determining the function of Cul-5, a ubiquitin ligase, in Drosophila oogenesis., Victoria Hardy
- GP90 The function of Hrb27c in Drosophila oogenesis, Danielle Finger
- GP91 Alteration of Skeletal Muscle Lysophospholipid Metabolism in Mouse and Human Obesity, Patrick Ferrara
- GP92 Examination of the Mechanism of Intersubunit Communication in Pyruvate Carboxylase Hybrid Tetramers, Lauren Westerhold
- GP93 Thermodynamic Analysis of the Catalytic Regulatory Mechanism of Pyruvate Carboxylase, Stephanie Adams
- GP94 Resveratrol Alleviates Lipid-Induced Insulin Resistance in Lean, But Not Severely Obese Myotubes, Kristen Turner
Intramyocellular Triacylglycerol is Associated with Peroxisomal Biogenesis in Skeletal Muscle from Lean and
- GP95 Obese Humans, Tai-Yu Huang
- GP96 Acute Reversal of High Fat Diet-Induced Insulin Resistance is Accompanied by a Restoration of Redox Status
in Skeletal Muscle, Lauren Reese
- GP97 Isolated Proteoglycan Used to Study Hyaluronan, Samantha Sellers
- GP98 Knock-down of hyaluronan synthesis in chondrocytes using Adeno-shRNA and Crispr/Cas9 systems, Yi Huang
- GP99 Mitochondrial Capacity is Decreased in Skeletal Muscle with Estrogen Depletion, Maria Torres
- GP100 Transgenerational Epigenetic Reprogramming Through the Paternal Line in Drosophila Melanogaster.,
Oksana Williams
- GP101 Acute restraint stress alters zebra finch song performance: Potential model for evaluation of neurobiological
effects of developmental stress, Tessa Holland
- GP102 Increased energy expenditure and insulin sensitivity, but not protection from obesity, in phosphatidylethanolamine
methyltransferase knockout mice on long-term high-fat diet feeding, Anthony Verkerke
- GP103 Transglutaminase 2 and Calreticulin interact to regulate Transglutaminase 2 Transamidase Activity, Jessica Visconti
- GP104 GPR4 Activation by Acidosis Inhibits Migration and Tubular Network Formation of Human Umbilical Vein
Endothelial Cells (HUEVCs), Elizabeth Krewson

Graduate Poster Presentations

MSC Room 22I | Biomedical Sciences cont.

8:15 am — 2:30 pm

- GP105 The Role and Mechanism of Dietary Proteins in the Detoxification of Aflatoxin B , a Potent Hepatocarcinogen and Common Food Contaminant., Blake Rushing
- GP106 Selecting for an Aggressive, Consistently Metastatic Variant of the Murine Triple Negative Breast Tumor 2225L, Kassondra Balestrieri
- GP107 Comprehension of Lexical Ambiguities in Discourse Contexts in Persons with Aphasia, Amy Henderson
- GP108 Metabolic Flexibility is Impaired in Myotubes Derived from Severely Obese Humans, James Hinkley
- GP109 Sepapterin Supplementation Fails to Ameliorate Diesel Exhaust Particle Exposure-Related Erectile Dysfunction in Lewis Rats., Daniel Becak
- GP110 Accelerated Nucleotide Degradation induces atrophy in muscle, Patrick Davis
- GP111 Electrical pulse stimulation and resveratrol can enhance glucose metabolism in human skeletal muscle myotubes, Sanghee Park
- GP112 The Role of ftz-f1 in the Drosophila Ovary, Amelia Helms
- GP113 Dual Roles of claudin-7 in human lung cancer cell growth and metastasis, Do Hyung Kim
- GP114 Dopamine D1 and D3 receptor interactions with morphine in an animal model of Restless Legs Syndrome (RLS), Alexander Yllanes
- GP115 Protein Kinase G and VASP in the Control of Vascular Smooth Muscle Cell Migration, Andrew Holt
- GP116 HTLV-I basic leucine zipper factor (HBZ) interacts with small Maf transcription factors, Amanda Rushing
- GP117 Optimizing Oxidative Phosphorylation by Manipulating Mitochondrial Cardiolipin Levels, Elizabeth Sullivan
- GP118 Host specific expression and intracellular localization of the Vaccinia virus O1 protein, Anastasia Weeks
- GP119 Role of microglia activation in nicotine induced sensitization to cocaine., Partha Nagchowdhuri
- GP120 Hypoxia Inhibits N6 methyladenosine formation in mRNA, Nathaniel Fry

MSC Room 22I | Education

12:30 pm — 2:30 pm

- GP121 PRESENTATION WITHDRAWN
- GP122 Heather Renee Miller, Graduate Student, Child Development and Family Relations at East Carolina University, Heather Miller
- GP123 The Impact of Unemployment on Enrollment in the North Carolina Community College System, Natasha Worthington
- GP124 Senior Games: Students' Community Outreach with Older Adults, Tiesha Martin

Online Presentations

Online Presentations | General

- ON1 Flux through fatty-acid oxidation alters redox state in muscle, Cody Smith
- ON2 Transport and Fate of Pharmaceuticals and Personal Care Products (PPCPs) In Coastal Plain Soils, Beau Benfield
- ON3 The Prophecy Series: Modernism vs. Renaissance, Dazzala Cofield
- ON4 Performance Funding & the North Carolina Community College System, Angela Wall
- ON5 Morphological Analysis Perspective (MAP) - An application of General Morphological Analysis (GMA) to software engineering project management, Roger Moore
- ON6 Persistent Cardiac Ischemia Reperfusion Injury Following Intratracheal Instillation of 20 nm Citrate Capped Nanosilver, Nathan Holland

Postdoctoral Scholar Presentations

MSC Great Room 2 | General

10:00 am — 12:00 pm

- PP1 Estrogen Receptor ER Plays a Major Role in Oxidative Stress Dependent Myocardial Dysfunction Caused by Ethanol in Conscious Female Rats, Fanrong Yao
- PP2 Glucose Metabolism is Impaired in Cultured Myotubes from Severely Obese Humans, Kai Zou
- PP3 Characterize genetic interaction between fuzzy tassel (fzt) and knottedI (knI) in maize, Queying Ding
- PP4 Sphingolipid Metabolism — Exploitation and Integration of Novel Targets for Melanoma Therapy, Samy Morad
- PP5 Anandamide induces endoplasmic reticulum stress-apoptosis in tumorigenic keratinocytes: Role of cyclooxygenase-2 and novel cytotoxic metabolite, prostamide J2, Eman Soliman
- PP6 The Mitochondrial Targeted Peptide MTP-131 Restores Limb Perfusion and Reduces Pathology in Ischemic Limb Muscle of Genetically Susceptible Mice, Terence Ryan
- PP7 A comprehensive toolkit for multiplex CRISPR-Cas9 genome editing in plants, Levi Lowder
- PP8 Technology Decision Assessment Companion (TDAC): Bridging the Gap between Researcher and Inventor, Artie Rogers
- PP9 Responses of Lipolysis to a Meal after Physical Activity in Lean and Obese Children, Huimin Yan

Undergraduate Oral Presentations

MSC Great Room I | Natural Sciences

8:15 am — 9:45 am

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| UO1 | 8:15-8:30 | Social status dependent adaptation of the Mauthner mediated C-start escape response in zebrafish (<i>Danio Rerio</i>), Katie Clements |
| UO2 | 8:30-8:45 | Conspecific pollen precedence and its contribution to speciation in <i>Triodanis perfoliata</i> , Adrian Modzik |
| UO3 | 8:45-9:00 | Effects of Carbon Based Media in BioSand Filters on Drinking Water Quality, Melissa Wilson |
| UO4 | 9:00-9:15 | Generating and characterizing androgen receptor knockouts in zebrafish, Zayer Thet |
| UO5 | 9:15-9:30 | Optically Stimulated Luminescence From Human Tooth Enamel, Isaac Boota |
| UO6 | 9:30-9:45 | Dopamine (DA) receptors D1 and D3 in the spinal cord and their effect on morphine responsiveness with age., Sophia Samir |

MSC Great Room I | Biomedical Sciences

10:00 am — 11:15 am

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| UO7 | 10:00-10:15 | Epigenetic Effect of Modified Diet and Exercise on <i>Drosophila Melanogaster</i> Metabolic Phenotype and Cardiovascular Health, Ajay Ajmera |
| UO8 | 10:15-10:30 | The Association Between Metabolism and the Expression of Circadian Regulatory Genes, Aenia Amin |
| UO9 | 10:30-10:45 | PRESENTATION WITHDRAWN |
| UO10 | 10:45-11:00 | Vaccinia Virus OIL Virulence Gene and Protein Localization, Shayna Mooney |
| UO11 | 11:00-11:15 | Respiratory Measures of Musical Theater Singers, Classical Singers, and Non-singers., Payton Burnette |

Undergraduate Oral Presentations

MSC Great Room 2 | Fine Arts

8:15 am — 10:00 am

UO12	8:15-8:30	The framing and agenda-setting functions of mass shooting reports in print media, Grace Haskin
UO13	8:30-8:45	I Lie Awake - A Dance Performance Piece, Kristalyn Gill
UO14	8:45-9:00	2014 Apple iHack, Summer Falgiano
UO15	9:00-9:15	Cyberbullying: Frequency, Impact, and Prevention, Courtney Dupree
UO16	9:15-9:30	Investigating and Sharing the Stories of Our Community's Heroes, Jessica Jewell
UO17	9:30-9:45	Instrumental Music of the Middle Ages: Examining the Evidence Critically, Trevor Rupe
UO18	9:45-10:00	The Music of Now: 21st Century Flute Performance Techniques, Benjamin Sledge

MSC Great Room 2 | Technology and Computer Sciences

10:15 am — II: 15 am

UO19	10:15-10:30	Sonic Plaza Documentation, Ethan Garner
UO20	10:30-10:45	Time Study and Analysis on Body Shop Process, Adam Ward
UO21	10:45-11:00	Optimizing recycling and disposal procedures for shipping pallets at Grady-White Boats., Robert Wise
UO22	11:00-11:15	What is the most efficient location of the new visitors center in the Lake James State Park?, John Kuhlman

MSC Great Room 2 | Social Sciences

I:15 pm — 4:00 pm

UO23	1:15-1:30	Southern Methodist Missionaries in the Belgian Congo: Christianized Imperialism in the Heart of Africa, Jonathan Richards
UO24	1:30-1:45	The Training and Decisions of King Leonidas, Jessica Rassau
UO25	1:45-2:00	The Globalization of Medicine: A Look at Ayurveda's Increasing Presence in Biomedicine, Mansi Trivedi
UO26	2:00-2:15	Medical Student Stress and Stress Management, David Sager
UO27	2:15-2:30	Teacher Perceptions of Physical Education in Head Start Preschool Classrooms, Madison Keesling
	2:30-2:45	BREAK

Undergraduate Oral Presentations

MSC Great Room 2 Social Sciences cont.		I:15 pm — 4:00 pm
UO28	2:45-3:00	Improving On-Task Behavior of Minority Middle School Students Using Leadership Modeling, Motivational Interviewing, & Group Contingencies, Adam Johnson
UO29	3:00-3:15	Reported Dietary Intake and Physical Activity of Boys and Girls Club Members in Pitt County North Carolina, Allender Lynch
UO30	3:15-3:30	Beliefs about the rehabilitation of aggressive canines, Destiny DeHart
UO31	3:30-3:45	Using an Anthropological Framework to Evaluate the Effectiveness of NGOs in Promoting Change: A Close Look at Witness for Peace in Colombia, Angela Krider
UO32	3:45-4:00	Consumer acceptance of guacamole with added whole soybeans compared to guacamole made without soybeans, Kristi Wilkerson

Undergraduate Poster Presentations

MSC Social Room | Social Sciences

8:15 am — 12:15 pm

- UP1 An Analysis of Employment Preferences: A Study of Marriage and Family Therapy Students, Sarah Christian
- UP2 Comparing the Quality of Media Coverage in Democratic Elections, Hannah Leicht
- UP3 CouchSurfing and the Experience Economy, Allison Wiles
- UP4 Trend and Disparities in Fruit and Vegetable intake among NC adults., Shannon Vucich
- UP5 Does Stalking Stigma Depend Upon Relationship Phase?, Martha Ervin
- UP6 The Analyzation of Emerging Latino Communities' Health System Infrastructure, Sydney Hendricks
- UP7 A comparison of youth poverty and development initiatives in four Latin American countries, Daren Roy
- UP8 Islam, Media, and Conflict, Paige Moorhead
- UP9 The Relationship Between Preadolescent Body Mass Index and Body Image, Megan Hauser
- UP10 Knowledge and Attitude Assessment of Nursing Students, Faculty, and Staff Regarding LGBT Issues, Justin Smith
- UP11 Best Practices in American Indian Student Retention at ECU in Juxtaposition to the UNC System, Joshua Griffin
- UP12 The Influence of Family Functioning on Medical Self-Efficacy in Adolescents with Sickle Cell Disease, Stephanie Wiafe
- UP13 Ecclesiology of Dietrich Bonhoeffer, Jason Workman
- UP14 Osteoporosis Knowledge and Health Beliefs in a Sample of Older African Americans, Kametria Mcneil
- UP15 Are College Students Color-Blind? Associating Demographic Factors with Latent Racism, Kelsey Weiss
- UP16 Evaluating Depression Management for Elderly Clients in Home Health Care, Michaela Atwell
- UP17 Understanding Health Care Providers' Knowledge, Attitudes, and Practices Regarding HPV Vaccines, Shawna O'Rorke
- UP18 Providing Access to Child Passenger Restraint Information: Is There a Role for Elementary Schools and Daycare Facilities?, Meredith Edwards

Undergraduate Poster Presentations

MSC Social Room | Social Sciences cont.

8:15 am — 12:15 pm

- UP19 A New Look for Introductory Psychology: Exploring Student Perceptions of An Open Access Textbook, Jacqueline Glass
- UP20 The Effects of Social Media on Subjective Well-Being, Amanda Malone
- UP21 Evaluating Type I Diabetes Management in an Elementary School Setting, Rebekah Carbone
- UP22 Personal Factors Affecting Oral Hygiene, Chloe Strickland
- UP23 Soviet Animation Before and After Khrushchev's Thaw: Historical and Critical Analysis, Kyle Binaxas
- UP24 Marketing Development with New Detroit Resto-Mods, Brendan Schachle

MSC Social Room | Fine Arts

10:15 am — 12:15 pm

- UP25 Channels of Communication: An Analysis of Students' Preferred Methods of Communication, Kristen Martin
- UP26 PRESENTATION WITHDRAWN
- UP27 Twitter and Sports Communication: The Effect on Athletes, Organizations and the Traditional Media., Michael Prunka
- UP28 Fresh Eyes: Image Based Social Media, and How Interior Design Students Utilize It, Nicole Lobell

MSC Social Room | Human Health

10:15 am — 2:30 pm

- UP29 Influence of Pre-Pregnancy Activity Level on Birth Weight, Kellie Baker
- UP30 Relationship between symptoms of muscle dysmorphia and body composition in high volume weightlifters, Sarah Horton
- UP31 An Evaluation of Referrals and Follow-Up Care for High Risk Infants, Lindsay Caddell
- UP32 Contralateral Suppression of Transient Evoked Otoacoustic Emissions in Young Adults with Varying Degrees of Musical Experience, Emma Daughtrey

Undergraduate Poster Presentations

MSC Social Room | Human Health cont.

10:15 am — 2:30 pm

- UP33 Evaluating an Evidence-Based Program that Addresses Childhood Obesity in a Middle School in Rural Eastern North Carolina, Christina Smith
- UP34 Reducing Maladaptive Sensory Neuronal Growth to Target Below-Level Pain Following Spinal Cord Injury, Blaire Conner
- UP35 Understanding Cultural Self-Efficacy among Medical Students, Charles Jauss
- UP36 Understanding the Health Utilization Patterns among Latino Seasonal Farmworkers in Rural Eastern North Carolina, Hannah Moss
- UP37 Hormone Concentrations in Portal Blood in Response to a Glucose Challenge, Michaela Morris
- UP38 Stress, Burnout, and Coping Mechanisms in Health Professionals Working in Pediatric Oncology, Alix Rothbart
- UP39 The Effects of Exercise During Pregnancy On Infant Neuromotor Skills, Georganna Gower
- UP40 Using Puppetry to Enhance Children's Awareness of the Benefits of Exercise, Shayna Meyers
- UP41 Evaluating the Role of the School Nurse in the Reintegration of School-Age Children with Chronic Health Problems, Kali Harrison
- UP42 Examining connections between structural violence, food politics, and health inequalities in the United States: The dangers of regulatory capture, Kristin Karas
- UP43 Sugar Sweetened Beverage Consumption and Food Insecurity in Obese Pediatric Patients, Kimberly Bostick
- UP44 Impact of midgut bacteria on Aedes albopictus vector competence for La Crosse virus, Deepa Ramaswamy
- UP45 Program Evaluation of Preferred Health Information Distribution Methods for Hispanics, Cathryn Simmons
- UP46 EHR and Cost: Is "Meaningful Use" Meaningfully Reducing Health Care Costs?, Katie Pridgen
- UP47 Teen Pregnancy at School: The Role of the School Nurse, Jessica Firnhaber
- UP48 The Efficacy of Measuring Visceral Adipose Tissue using Dual Energy x-ray Absorptiometry, John Webber

Undergraduate Poster Presentations

MSC Social Room | Human Health cont.
10:15 am — 2:30 pm

- UP49 Evaluation of the Sexual Health Education of Teenage Males in a Middle School in Rural North Carolina, Karina Dierolf
- UP50 Women's Sexual and Reproductive Health Concerns, Perspectives, and Strategies, Including Perspectives about Pelvic Floor Muscles, as Perceived by Sexually Active College Women, Whitney Rodgers

MSC Social Room | Education
12:30 pm — 2:30 pm

- UP51 Using S.T.E.A.M. To Visualize Plants In Outer Space, Brittany Brisson
- UP52 Sustainability for Student Learning, Sheng Xiong
- UP53 Knowledge of Sustainable/Green Friendly Designs of Croatan Building, Jordan Williams
- UP54 College algebra redesign: improve student learning and success using a hybrid emporium course model, Andrew Geddes
- UP55 The Incorporation of Reading and Writing in the Middle Grades Math Classroom: An exploration in purpose and possibilities, Mary Smith
- UP56 Educating the Visitors of Lake James State Park, Jacob Thomas
- UP57 A COMPARISON OF MOTIVATION OF AN EARLY ALERT SYSTEM IN K-12 AND HIGHER EDUCATION, Kathryn Camilleri
- UP58 Exploring the impact of a research methods laboratory course on dietetic students self-efficacy for engaging in research and writing, James Parris

MSC Gallery | Natural Sciences
8:15 am — 2:30 pm

- UP59 Identification and Characterization of natural modifiers of the maize microRNA pathway, Jared Ingle
- UP60 Synthetic Approaches to Indicating Acid Scavengers, Madison Josey
- UP61 Hormone Exposure During Pregnancy and Maternal Care, Rachel Lockyer
- UP62 Case study analysis of a 'rain shadow' off the Georgia coast, Nicholas Golden
- UP63 Accumulated Cyclone Energy and Tropical Cyclone Tracks: An In-Depth Analysis of the Anomalously Inactive 2013 Atlantic Hurricane Season, Thomas Vaughan
- UP64 The Edible World of Tomorrow, Robert Oliveira

Undergraduate Poster Presentations

MSC Gallery | Natural Sciences cont.

8:15 am — 2:30 pm

- UP65 Mapping the maize mutant, indeterminate floral apexI, Allison Anthony
- UP66 Cultivating the unseen majority: Soil microbial response to long-term nutrient additions, Casey Eakins
- UP67 Freshwater Zooplankton of Lake James, North Carolina, Amber Burch
- UP68 Bioinformatic exploration of Hoxa2 and HoxII in vertebrate evolution, Kari Carr
- UP69 Assessing morphological variability in silversides along the Mid-Atlantic Bight, Stephen Parker
- UP70 PRESENTATION WITHDRAWN FOR IP PROTECTION
- UP71 The role of pollinators in reproductive isolation between two subspecies of *Triodanis perfoliata*, Christina Hoffert
- UP72 ASSESSMENT OF NICHE PARTITIONING IN CO-OCCURRING SILVERSIDES FROM THE ALBEMARLE AND PAMLICO SOUNDS OF NORTH CAROLINA., William Cope
- UP73 Call Use in a Peruvian Poison Frog, *Ranitomeya imitator*, Casey Meeks
- UP74 Solubility of coumarin and vanillin in subcritical water, Albert Tran
- UP75 Characterization of MiR319-Regulated Zmtcptf29 During Inflorescence Development, Jessica Wilson
- UP76 Developmental Patterns of Cleistogamy and Chasmogamy in *Triodanis perfoliata*, Elizabeth Bernetski
- UP77 Effect of Endocrine-Disrupting Chemicals on Fetal Testes Morphology, Morgan Boyd
- UP78 Stability of Coumarin and Vanillin in Subcritical Water, Grayson Parker
- UP79 In Search of an Embryo: Using Microscopy to Assess Embryo Development and Seed Viability in *Thalictrum cooleyi*, Erika Dietrick
- UP80 Metal-Catalyzed Displacement Reaction with Retention of Configuration: A Quantum Chemical Investigation of the Mechanism, Kate Mcpherson
- UP81 A test of phototropic response in rhizomes of *Euthamia caroliniana*, Joshua Smith
- UP82 Interactions between Mcm10 and Genes Located on the Third Chromosome of *Drosophila melanogaster*, Bryan Anstead
- UP83 Underwater Vessel Noise Alters Fish Diets, Travis Tobin

Undergraduate Poster Presentations

MSC Gallery | Natural Sciences cont.

8:15 am — 2:30 pm

- UP84 Synoptic Climatology of propagating Sea Breeze events in North Carolina, Joel McAuliffe
- UP85 Affect of Dominance Hierarchy Formation on Neurotransmitter Gene Expression in the Crayfish *Procambarus clarkii*, Aayushi Patel
- UP86 Analysis and Determination of MicroRNAs in Root-Knot Nematodes, Taylor Gray
- UP87 Excessive heat may play a role in hatching success for the Eastern Bluebird, Olivia Green
- UP88 Conservation of Archaeological Wood using Non-Reducing Sugars, Adeem Tahira

MSC Room 22I | Engineering

8:15 am — 10:15 am

- UP89 Analysis and Redesign of Solder Wave Machine Return Mechanism, Jonathan Hawkins
- UP90 Global Positioning, Srilekha Bellamkonda
- UP91 Advancing Electrospun Scaffold Design to Improve Cell Viability, Cody Temple
- UP92 Pore Dimension Analysis from Processing on Electrospun Laser Micro-Machined Scaffolds, Layne Barefield
- UP93 Exploration of Modeling and Simulation in Biomedical Applications, Alex Bryan
- UP94 New Manufacturing Processes in the Aerospace Industry, Samuel Axtman
- UP95 Exploring the Use and Acceptance of Thermasteel, Taylor Cross
- UP96 A Comparison of Blast Membrane Effects on Achieved Overpressure in an Advanced Blast Simulator, Melissa Hall

MSC Room 22I | Biomedical Sciences

8:15 am — 2:30 pm

- UP97 Characterization of the Early Gene at 23 as an Ecdysone Ovarian Signaling Target, Radhika Kothadia
- UP98 Intensity of amyloid beta (A_β) peptides and the exposure of their hydrophobic residues in forming amyloid plaques. Sarah Sipe
- UP99 The Role of miRNAs in Early and Late-diseases in Response to Post-embryonic Nicotine Exposure in *C. elegans*, Krishna Patel
- UP100 Determination of Gd N@C (OH) interaction with Zn²⁺ via fluorescence measurements, Andrew Reid
- UP101 Effect of Treadmill Verses Overground Running on Knee Joint Loads, Holly Johnson

Undergraduate Poster Presentations

MSC Room 221 | Biomedical Sciences cont.

8:15 am — 2:30 pm

- UP102 Validating the Patient Reported Outcomes Measurement Information System for Pain, William Hayden
- UP103 Successful Elimination of Viral Pathogen from Murine Breast Tumor Cells by Passaging Tumors in Athymic Nude Rats, Matthew Britt
- UP104 Prevention of Synaptic Loss in Alzheimer's Triple-transgenic Mouse Model with miRNA-43I, Sean Ross
- UP105 Characterizing the Anti-Cancer Activity of a Novel J-Series Prostamide, Rene Escobedo
- UP106 Vaccinia OIL Protein Characterization, Allen Scurlock
- UP107 The effect of exercise timing on the blood glucose response to a meal in children, Madelon Wygand
- UP108 Effect of Foot Strike on Patellofemoral and Tibiofemoral Joint Contact Forces, Mikayla Huf
- UP109 Regulation of Angiotensin II induced TGF- I mediated Collagen Expression via Snail and Slug in Cardiac Myofibroblasts., Rohin Gawdi
- UP110 Neurobehavioral Impairments in a Triple-Transgenic Mouse Model of Alzheimer's Disease, JoColl Burgess
- UP111 The Effects of Overexpression and Knock-Down of SH3PX1 on Escort Cells, Jasmine Hughes
- UP112 Dietary control of cell cycle dynamics in stem cells, Taylor Hinnant
- UP113 Identification of Damaged DNA Adducts from Exposure to Benzo[a]pyrene in the TP53 gene, Lea Taylor
- UP114 PREDICTORS OF BONE GEOMETRY IN RUNNERS, Karleen Bartol
- UP115 The Characterization of the Resolution Macrophage in Hepatic Fibrosis Reversal, Caroline McCall
- UP116 Mutations in Drosophila Mcm10 effect the formation of chromatin, Sidney Bedsole
- UP117 The effect changes in sodium concentrations have on mitochondria., Teresa Heavilin
- UP118 DIFFERENCES IN TOTAL HORIZONTAL BAR DISPLACEMENT DURING A POWER CLEAN BETWEEN COMPETITIVE AND RECREATIONAL WEIGHTLIFTERS, Tayler Snipes
- UP119 Nicotine control of germline cell fate in *Caenorhabditis elegans*, Robert Kobet
- UP120 Investigating the Role of CtBP in Colorectal Cancer, Ashley Owens

Undergraduate Poster Presentations

MSC Room 22I | Biomedical Sciences cont.

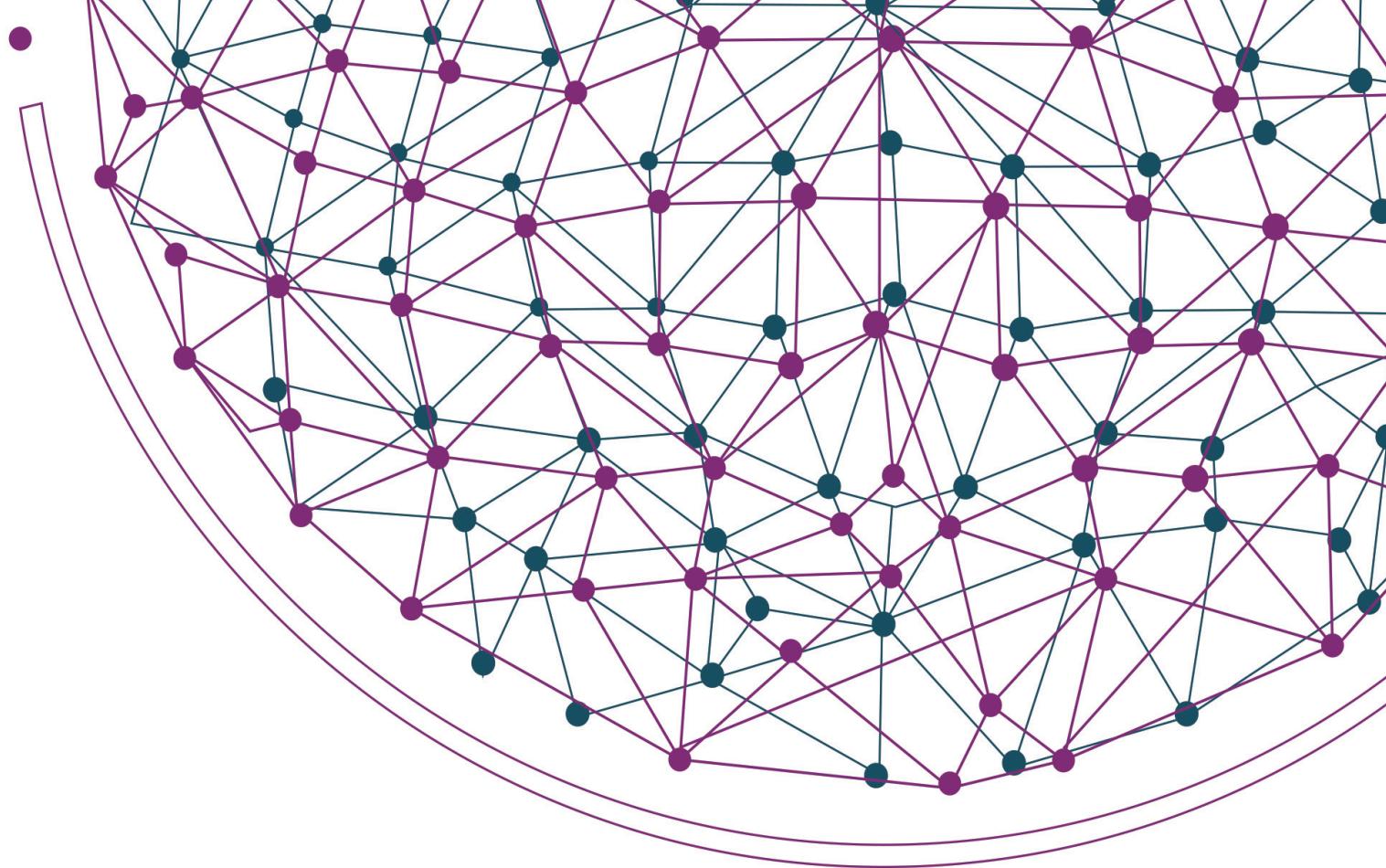
8:15 am — 2:30 pm

- UP121 Determination of Gd N@C (OH) interaction with Cu²⁺ via Fluorescence measurements, Kimberly Valle Mejia
- UP122 The Effects of Complex Learning on Hippocampal Neurogenesis in a Mouse Model of Alzheimer's Disease, Tucker Johnson
- UP123 Improved Synthesis of Oosporein, Joel Glotfelty
- UP124 The Effects of High-Fat and High-Sugar Diets and Exercise on the Development of Drosophila First Generation Offspring, Michelle Pike
- UP125 The cellular transcription factor GATA-4 is abnormally express in HTLV-I transformed T-cells, Stephanie Nguyen

MSC Room 22I | Technology and Computer Sciences

12:30 pm — 2:30 pm

- UP126 Enhanced Protein Shaker, Garrett Carpenter
- UP127 Process Flow Improvement for Keihin, Nancy Smith
- UP128 Improved Spent Primer Cup, Anthony Lovitt
- UP129 Building Material Proposal for Lake James State Park, Travis Eudy
- UP130 Detection and Classification of Moving Train Cars, Timothy White
- UP131 Benefits of Smart Glass on East Carolina's Campus., Nicholas Corigliano
- UP132 Innovative Product Solutions, Brian Greene



GO1

Reproductive plasticity in a winter annual plant, Lauren I. Colbert, East Carolina University, Greenville, NC

Cleistogamy is an intriguing reproductive strategy in which a plant produces closed, obligately selfing, sometimes apetalous flowers. Fully cleistogamous species are uncommon; most cleistogamous species produce both cleistogamous and chasmogamous flowers, which are typical open flowers that are capable of outcrossing. Relative allocation of chasmogamous and cleistogamous flowers has been demonstrated to be phenotypically plastic in response to various environmental factors in many dimorphic cleistogamous species. This plastic ability has been argued to be an adaptive advantage of dimorphic cleistogamous species. *Triodanis perfoliata* also known as clasping Venus' looking-glass is a weedy winter annual in the Campanulaceae family that exhibits dimorphic cleistogamy. Two subspecies of *Triodanis perfoliata* differ in allocation of chasmogamous and cleistogamous flowers and in habitat preferences. Using data from a densiometer study of local sites, it has been determined that *Triodanis perfoliata* ssp. *perfoliata* is found in shady areas while *T. perfoliata* ssp. *biflora* is found in open areas with high light. Light has been shown to induce a plastic response in other dimorphic cleistogamous species. It is possible that this plastic response is what has allowed *T.p. ssp. biflora* to persist in a different habitat and also resulted in its speciation. However, the plastic ability of *Triodanis perfoliata* has not yet been evaluated. Using a growth room experiment I am determining whether light affects the ratio of chasmogamous to cleistogamous flower production in the two subspecies of *Triodanis perfoliata*. This response is hypothesized to be the key factor that has allowed the species to persist in a habitat typical of *T. perfoliata* ssp. *biflora*. It may also be this same response that is fueling the speciation of the two *Triodanis perfoliata* subspecies.

GO2

Effects of Disturbance and Nutrient Availability on the Composition and Diversity of Soil Microbial Communities, Joshua Cameron Thigpen, East Carolina University, Greenville, NC

Species diversity has been argued to have a major influence on many aspects of a community such as stability, resilience, and ecosystem functioning. Determining how factors such as disturbance and nutrient availability affect species diversity in a community has been a major goal of community ecology. With this study, I am determining how species diversity and composition of soil bacterial communities are affected by the amount of nutrients available in the environment as well as the amount of disturbance the environment is experiencing. I am also characterizing soil microbial communities at a long-term ecological research site at the West Research Campus, located in Pitt County, NC. My research is complementing previous work carried out in the WRC on the effects of these factors on plant communities. The land of the site is relatively flat which causes poor drainage of excess water characterizing over 60% of the site as jurisdictional wetlands. The experimental design consists

of eight blocks with each block containing four different experimental treatment plots: mowed and fertilized, mowed and unfertilized, unmowed and fertilized and unmowed and unfertilized (control). Soil samples were collected from each plot in each block, and the samples were analyzed. DNA extracted from soils was analyzed using amplicon sequencing of the 16S Region of the ribosomal RNA gene. The Illumina MiSeq Platform was used to sequence the bacterial DNA from each sample. Once the DNA was sequenced, the Mothur Pipeline will be used to analyze the DNA sequences. Mothur takes the DNA sequences through multiple cleanup steps that will ultimately produce a matrix containing the sample number and the operational taxonomic units (OTUs) or microbial "species" associated with each sample. The OTUs will be used to determine the microbial community composition and diversity of the samples using alpha diversity metrics. The OTUs will also be used to determine similarities and differences between the blocks and between the treatments within each block using different beta diversity metrics. This study will contribute to our understanding of how soil bacterial communities are affected by common environmental factors. By determining the bacterial composition of the soil, which is associated with the plant species located in the WRC, we will lay the foundation for future work on plant-microbe interactions.

GO3

Critical Biological Knowledge for Conservation of the Federally Endangered Herbaceous Plant, *Thalictrum cooleyi* Ahles, A. Renee Fortner & Claudia L. Jolls, East Carolina University, Greenville, NC

Thalictrum cooleyi Ahles, or Cooley's meadowrue is a federally endangered herbaceous plant which occurs in fire-dependent, wet pine savannas of the southeastern US. The goal of my study was to gain critical knowledge on the habitat and breeding biology of *T. cooleyi*. In two NC populations of *T. cooleyi*, I examined 1) woody species associates, 2) sex ratios, 3) potential pollen limitation, and 4) seed germination requirements. Logistic regression showed that *T. cooleyi* is more likely to occur as canopy closure decreases and woody understory cover increases. *Morella cerifera* L., wax myrtle, was the only significant shrub predictor of Cooley's meadowrue ($\text{Wald} = 13.823$, $\text{df} = 1$, $p < 0.0001$). Hermaphroditic flowers are uncommon (found in 5% of 375 plants surveyed), confirming that *T. cooleyi* is predominantly dioecious (i.e., separate female and male flowers occur on different plants). At both sites, there are twice as many males as female plants. Despite male-biased sex ratios, supplementation experiments showed that seed set is limited by pollen availability. Average seed set for plants with hand pollinated flowers was higher than for open pollinated controls (77.5 % vs. 34.5 %, respectively). Cooley's meadowrue seeds require cold stratification at 1 °C to break dormancy. Germination rates can be quite low (II.3 %, $n = 779$ seeds), likely due to low seed viability and underdeveloped embryos. Based on my research, Cooley's meadowrue recovery could be threatened by habitat loss (i.e., transition of open pine savanna to dense forest), pollen limitation to seed set, and poor seed viability.

GO4

Southeast U.S. Precipitation Changes in a Warmer Climate, *Mark R Nissenbaum, Rosana Nieto Ferreira & Thomas Rickenbach, East Carolina University, Greenville, NC*

This study will investigate changes in precipitation organization in a warmer climate using the Weather Research and Forecasting (WRF) model. Precipitation organization, or modes of delivery, can be divided into widespread, heavy mesoscale precipitating features (MPFs) and short-lived, isolated precipitating features (IPF). Existing studies suggest that higher water vapor content will lead to an overall increase in precipitation, but few studies have examined changes in the precipitation modes of delivery. WRF will simulate notable wintertime and summertime precipitation events in the Southeast US under the current and future climate. In general, MPFs tend to be more common during the winter as they are linked to the large-scale forcing provided by mid latitude cyclones, while isolated convective storms occur more often during the summer due to variations in surface heating. These precipitation events will be modified to resemble the future climate of the 2090s using the pseudo-global warming (PGW) approach based on an ensemble of temperature projections from the Coupled Model Intercomparison Project Phase 5 (CMIP5) for several representative concentration pathways (RCPs). A comparison between the present and future runs will reveal changes in precipitation modes of delivery. It is hypothesized that the higher water vapor content in the future simulation will result in an increase in the number of IPFs, while MPFs will be more intense and longer-lasting.

GO5

Elevated prenatal hormones program autism-like behavior in the rat, *Bevin Ellen Blake & Dr. Krista McCoy, Department of Biology, East Carolina University, Greenville, NC*

The rate of autism spectrum disorder (ASD) is now 1 in 68 children in the US, a 210% increase since 2002, and males are diagnosed 4:1 compared to females. It is not known why males are more susceptible to ASD, but one prominent hypothesis regarding this phenomenon is the Extreme Male Brain (EMB). Exposure to the correct hormonal milieu during specific developmental windows is critical for normal neuronal programming, and the EMB suggests that excessive levels of prenatal androgens, like testosterone, program an autistic behavioral phenotype. Testosterone can program the brain through binding to androgen receptor (AR) directly, but is commonly converted into one of two main metabolites: 5 -dihydrotestosterone, which also binds AR, or estradiol, which binds estrogen receptor. It is currently unknown whether the abnormal behavioral phenotypes associated with ASD are programmed by developmental androgen or estrogen mediated processes. To test the hypothesis that one of these main metabolites influences autistic-like behavior, we exposed pregnant rats to dihydrotestosterone propionate (DHTP), estradiol benzoate (EB), or a vehicle during a critical window of neurodevelopment. Offspring were assayed using standard techniques to measure autistic-like behaviors by observing social

behavior and anxiety/hyperactivity in a novel environment. EB treated males had significantly reduced interest in social novelty and elevated anxious behavior and hyperactivity. My research shows that high levels of prenatal estrogen impacted males more severely and lead to reduced sociability and abnormal stress responses. This finding has two important implications: 1) males are more sensitive to high levels of prenatal estrogen, which may help explain the male bias in ASD, and 2) aberrant estrogen mediated signaling induced autistic-like behavior, which may explain why prenatal exposure to estrogenic compounds (e.g. bisphenol A) has been correlated with ASD. My work lays an important foundation for understanding the male bias in autism as well as the relationship between prenatal exposure to estrogenic compounds and ASD.

GO6

Visitation by native insects to a threatened Great Lakes dune endemic plant is not affected by an organic kaolin clay insect deterrent, *Jaclyn N. Inkster & Claudia L. Jolls, Department of Biology, East Carolina University, Greenville, NC*

Larinus planus (Coleoptera: Curculionidae), an adventive non-native biological control, is used to limit seed production of weedy non-native thistles in North America. These weevils oviposit in flowering heads and the developing larvae consume ovules and seeds. *L. planus*, however, also has non-target impacts and reduces seed set of the federally threatened *Cirsium pitcheri* (Asteraceae) by 50-95%. *C. pitcheri*, a Great Lakes shoreline endemic plant, has no means of vegetative reproduction and relies solely on seed set for population persistence. *C. pitcheri* is primarily pollinated by native bees sensitive to conventional pesticides. Surround® WP (95% kaolin clay) is an insect deterrent used in organic agriculture. As a potential effective control for *L. planus* seed predation, kaolin clay must not deter potential pollinators. We applied Surround® WP to *C. pitcheri* plants in the field to examine the effect of this kaolin clay product on insect visitors to *C. pitcheri*. Our study site was located at Wilderness State Park in sand dunes along northern Lake Michigan. We recorded insect species, visits, and duration during 10 minute observations for 88 pairs of plants (control and 9% or 18% aqueous kaolin clay solution treatment). There were no significant differences in mean species richness, number of visits, or duration of visit between control and treatment groups. This study suggests no negative effect on insect visitors. Surround® WP may be a suitable deterrent to prevent non-target seed predation by a biological control insect on this threatened dune perennial.

GO7

Climatic challenges to the reproductive success of a threatened, secretive marshbird, the king rail (*Rallus elegans*), *Amanda*

Clauser, Susan McRae, Department of Biology, East Carolina University, Greenville, NC

King rail (*Rallus elegans*) populations are experiencing long-term declines attributable to habitat loss, particularly in the interior of their range. Sparse breeding populations in coastal areas may represent the last strongholds for this species. While coastal populations have fared better, climate change models predict these are at risk from extreme weather events. Southern coastal marshes are subject to high ambient temperatures in summer, frequently exceeding 40°C. Using thermochron iButtons inside model eggs, I am investigating the effects of temperature on hatching success. Preliminary data suggest that high ambient temperatures contributed to nest failure in 2014. Video recordings revealed for the first time that king rails have evolved a behavioral strategy of shading their eggs to cope with elevated temperatures late in the nesting season. Going forward, I will distinguish whether behavioral variation among parents is constrained by limits to plasticity, or is a function of individual differences in body condition. Coastal marsh breeders must also contend with water level variation. Nests surrounded by water may deter some predators, but this is a trade-off with flooding risk. Rails add material to their nests throughout incubation, though it is unknown if this is in direct response to rising water. I will test this possibility against the hypothesis that variation among parents in nest building effort is related to individual differences in body condition. Analyses are ongoing, but my results will reveal whether king rails exhibit sufficient behavioral flexibility to tolerate extreme environmental perturbations.

North Carolina by researchers at ECU, NCSU, NOAA, and APNEP. This protocol can detect changes in SAV distribution over annual or multi-year intervals.

The monitoring protocol developed for the state of NC has two phases: along-shore rapid assessments to determine where along the shore SAV may occur and permanent monitoring sites (i.e. sentinel sites) that will be revised annually. The results discussed in this presentation focuses on the results for the rapid assessment of Albemarle Sound. SONAR and underwater videography were utilized to sample along 10-km transects along the Albemarle Sound at 1-m depth isobath. Data were analyzed using ArcGIS and maps were generated that indicated the current presence of SAV in the sound. Video data was important in determining the accuracy of the SONAR as a visual confirmation of the bottom substrate. The majority of the SAV was found on the east side of the sound near the Oregon Inlet and on the north shore of the sound. The south shore had few scattered patches of SAV, with large beds near the mouth of the Alligator River and at East Lake. In addition, areas with dead tree stumps were devoid of seagrass as shown on the video. However, the SONAR classification algorithm had difficulty differentiating between stumps and SAV. Sampling such an extensive area (~400 km) is challenging; however, these results indicate that the combination of SONAR and video is useful as a rapid estimate of SAV distribution of large areas. We will use these rapid assessment results to select the long-term SAV sentinel sites to be sampled starting in the summer of 2015.

GO9

To what extent do larval predators affect the morphology and performance of juvenile toads? *Scott P. Jones and David R. Chalcraft,*

Center for Biodiversity, East Carolina University, Department of Biology, East Carolina University, Greenville, NC

Many organisms have the ability to alter their morphology, behavior or life history in response to environmental cues. For example, many tadpoles alter their morphology to better escape from predators. It is unclear, however, whether morphological changes made by tadpoles in response to predators in their aquatic environment have important consequences after the tadpoles leave a pond. To examine these potential consequences, we conducted an experiment where we 1) raised tadpoles of the southern toad in artificial ponds with no predators, caged predatory dragonfly larvae, or caged predatory fish, 2) transferred metamorphosed individuals to outdoor enclosures, and 3) assessed whether the morphology, survival, and performance of larvae and metamorphosed individuals varied among these treatments. Rearing environment affected both the morphology and survival of toads during their aquatic stage. For example, tadpoles reared with caged predators developed wider tail muscles and shorter and wider bodies than tadpoles reared without predators, with dragonflies inducing larger changes than fish. The presence of caged dragonflies enhanced the survival of larval toads relative to environments with no predators but caged fish had no effect on survival. Rearing environment had no effect on toad morphology either at metamorphosis or several weeks after metamorphosis. Though toads reared with predators could generally jump further at metamorphosis than toads reared without predators this difference was not observed in older metamorphosed toads. Thus the larval rearing environment has little effect on many traits after metamorphosis but has important effects prior to metamorphosis.

GO8

Rapid Assessment of Submerged Aquatic Vegetation using SONAR and Underwater Video in Albemarle Sound, North

Carolina, Hilde Zenil¹, Joseph Luczkovich^{1,2}

¹*Institute for Coastal Science and Policy, East Carolina University,*

²*Department of Biology, East Carolina University, Greenville, NC*

Submerged Aquatic Vegetation (SAV) is recognized worldwide for providing a wide range of ecological and economic services (blue carbon storage, fishery, habitat) to human populations conservatively estimated to be valued at \$12,000 per acre. SAV has declined worldwide, and it is estimated that since the late 1980's more than 90,000 ha have been lost. Changes in SAV distribution have been attributed to both natural (storms and herbivores) and to anthropogenic activities like upland development, dredging, propeller scarring, nutrient loading, and declines in water quality. These changes have been reported to occur quickly, in one year or less. The present research discusses the results from SAV monitoring efforts done in the Albemarle Sound in the 2014 summer and fall. This monitoring effort is part of monitor protocol developed for the State of

Does nanoclay technology adversely affect aquatic biota relative to natural nanoclays?, Suelen Calado-Tullio¹, David Chalcraft^{1,2}

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Greenville, NC

Nanoclays represent a large class of manufactured nanomaterials (NMs) (i.e. nanoscale particles from 1 to 100 nm) that have received great attention from the scientific and industrial communities. One important use of nanoclays is that they are useful in wastewater treatment and pollution control for removing toxic chemicals from water supplies. Nevertheless, many concerns have been raised about the effect of manufactured nanomaterials for aquatic ecosystems as the nanomaterials themselves could have adverse effects. In this study, we investigated how a natural nanoclay (Na⁺ montmorillonite) and two manufactured nanoclays (Cloisite®30B and Novaclay TM) affect the growth rate of *Clamydomonas reinhardtii*, a species of green algae. We raised algae in 250 mL beakers that had no nanoclays or one of the three types of nanoclay at five different concentrations (1, 10, 100, 1000, and 10000 mg/L) for 72h with four replications. We quantified algal population growth in each beaker as the difference in the log concentration of algae present after 72h of exposure and the log concentration of algae present at 0 hours of exposure. We found that increasing the concentration of Cloisite® 30B to 100 mg/L reduced the growth of *C. reinhardtii* by 75% and an increase to 10000 mg/L reduced growth by 87%. Natural nanoclay and Novaclay TM only inhibited algal growth by 8% and 2%, respectively and only under very high concentration (10000 mg/L). This work highlights that different types of nanoclays affect aquatic organisms differently and that we should be careful about the kinds of manufactured nanoclays that we introduce into aquatic environments. Though some manufactured nanoclays may not negatively affect aquatic ecosystems others may be very harmful. Understanding whether these types of nanoclays differ in their effects on other organisms in aquatic food webs is a critical next step toward assessing the impact that these types of manufactured nanoclays will have on aquatic food webs.

A Multi-Hazard Evaluation of Vulnerability using GIS along Cape Hatteras National Seashore, NC, Michael Flynn¹, Dr. Thomas Allen², Dr. Burrell Montz², Dr. JP Walsh³, Dr. Tom Crawford⁴

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The US National Park Service (NPS) Cape Hatteras National Seashore (CAHA) is located along the Outer Banks, a narrow string of barrier islands in eastern North Carolina. CAHA preserves cultural and natural resources of national significance, yet these islands experience continual tropical and extra-tropical storms and high vulnerability to sea level rise. Some of the CAHA's historic structures have already been relocated to protect them from eroding shorelines and storm inundation. NPS staff are especially concerned about the risk sea level rise poses to the historical and cultural resources located within the park and have recognized the utility of a long-term coastal hazard risk assessment. To address this issue they have formed a cooperative agreement with researchers at East Carolina University (ECU) (Allen, Montz, & Walsh CESU 2013-15). A multi-hazard risk assessment methodology was developed to evaluate the future susceptibility of these structures to coastal erosion, storm surge, and sea level rise. In order to keep this assessment relatively cost effective the project relies on existing research, reports, data sets, and the use of Geographic Information Systems (GIS). Coastal erosion has been the primary hazard evaluated thus far. A project for GEOG 6440 Coastal GIS in spring 2014 determined historic rates of shoreline movement using shorelines from 1946, 1980, 1997, 1998, 2004, and 2009. A linear regression rate was calculated along transects spaced 50 m apart for the extent of CAHA using the US Geological Survey (USGS) Digital Shoreline Analysis System (DSAS). The analysis focused on identifying erosion hotspots in relation to the location of historical districts of concern identified by NPS staff, which include: Bodie Island Lifesaving and Coast Guard Station and Lighthouse, the relocated historic district of Little Kinnakeet, Cape Hatteras Lighthouse, Hatteras Island Weather Bureau, and Ocracoke Lighthouse. It was determined that all of the historic districts are currently located in regions where the long-term oceanfront shoreline trend is erosional. Future effort to leverage these studies requires additional modest support, including a more detailed assessment of shoreline mapping and net movement, a predictive model of future shoreline positions in five year increments for 30 years, and coast wide modeling to enable assessment of other public and private properties for potential retreat or relocation.

GO12

MucR, a prokaryotic zinc finger protein, is a potential candidate for the acid-responsive regulator of the genes encoding the ferrous iron-specific transporter FtrABCD in *Brucella abortus* 2308, Ahmed Elwan Mohamed Elbassanny,
East Carolina University, Greenville, NC

Brucella are Gram-negative bacteria that cause abortion and infertility in their natural animal hosts resulting in extensive economic losses. Humans can also acquire a chronic, debilitating febrile illness known as brucellosis, as the result of contact with infected animals or their products. The brucellae live mainly inside host macrophages where they struggle to acquire enough iron to meet their physiological needs. However, Brucella spp. have evolved multiple strategies for overcoming iron limitation in their mammalian hosts. FtrABCD is a high-affinity ferrous iron (Fe^{2+}) transporter that is essential for the wild-type virulence of *Brucella abortus* 2308 in experimentally infected mice. The iron response regulator (Irr), the predominant iron-responsive regulator in Brucella and the other alpha-proteobacteria, controls the expression of the ftrABCD operon in response to the cell's iron needs. However, these genes are also induced by exposure to acidic pH. This acid-responsive expression of the ftr locus is important because it potentially allows the brucellae to fine-tune the expression of their iron acquisition genes to adapt to the acidic environment they encounter in the phagosomal compartment of host macrophages, where Fe^{2+} is thought to be a biological relevant iron source because acidic pH favors the stability of Fe^{2+} . The induction of expression of the ftr locus in response to acidic pH is retained in an isogenic irr mutant, indicating that the iron- and pH-responsive expression of these genes are independently regulated. Phenotypic analysis of mutants and electrophoretic mobility shift assays have identified the transcriptional regulator MucR as a potential candidate for the acid-responsive regulator of ftrABCD expression in *B. abortus* 2308. MucR is a zinc finger protein that coordinates the transcription of numerous genes in the -proteobacteria required for the successful endosymbiotic and pathogenic interactions of these bacteria with their animal and plant hosts. Within *Brucella* strains specifically, MucR-regulated genes play important roles in maintaining cell envelope integrity, polysaccharide biosynthesis, iron homeostasis and genome plasticity. Current studies are aimed at defining the mechanism by which MucR regulates the acid-responsive expression of the ftrABCD operon in *B. abortus* 2308, and determining how important this regulatory link is to the virulence of this bacterium in a mammalian host.

GO13

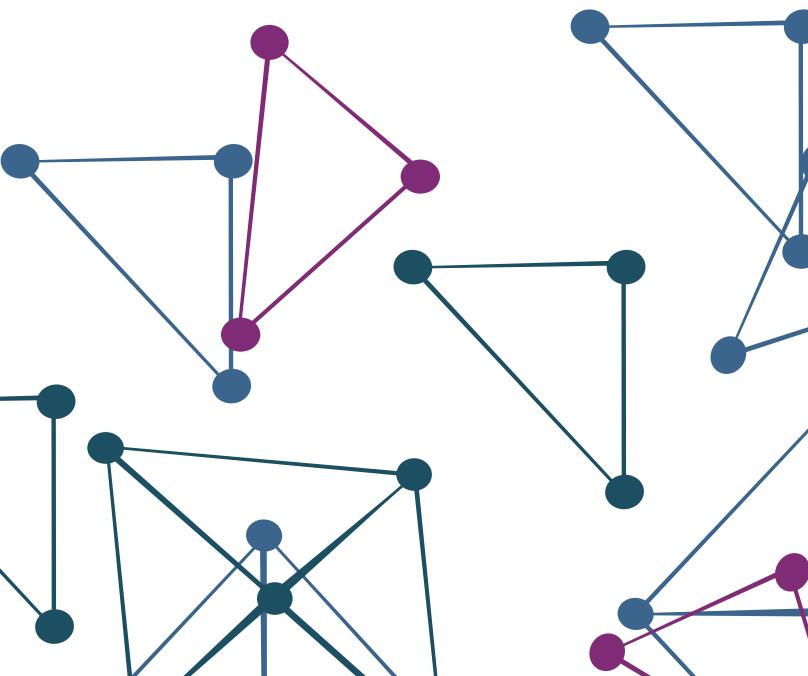
Needs Assessment of Coastal Land Managers for Drought Indicators in the Southeastern U.S., Casey Nolan¹, Dave Chalcraft², Dan Tufford³

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Columbia, SC

The ability to detect the onset of drought conditions is important to coastal resource managers because it enhances preparedness and provides opportunities for mitigation. Existing drought indicators, however, were designed with agricultural or wildfire management in mind. It is unclear whether coastal resource managers find existing indicators adequate for managing coastal resources and, if not, what information would be most useful for them to manage their resources under threat of drought. We conducted a needs assessment with 30 land managers and natural resource specialists of the coastal Carolinas to enhance our understanding of drought indicators and their utility for managing coastal natural resources. 80% of participants felt that early detection was important for their management, yet only 33% were aware of formal drought indicators. Half of the participants thought that drought indicators needed to be specifically focused on a particular kind of habitat but 90% thought that a single index could be useful for multiple coastal habitats that have broad similarities. Freshwater wetlands, especially those with organic soils, were identified as habitats most sensitive to the impacts of drought. Respondents indicated that variables focused on measures of freshwater availability and salinity would provide them with the greatest insight into the potential impacts of drought but 70% of the participants indicated that they do not have the resources to collect such data. The results highlight common priorities and concerns among land managers, and reveal opportunities to incorporate parameters of shared interest into a drought indicator tailored to coastal resource managers.



GO14

Chemically Synthesized Endocannabinoids as Potential Anti-Cancer Agents, Andrew Bryant Morris, Colin Burns, Rukiyah Van Dross, East Carolina University, Greenville, NC

Non-melanoma skin cancer (NMSC) is the most common diagnosed cancer in the United States with more than two million new cases diagnosed every year. Ten years ago the estimated cost of treatment for NMSC was \$1.4 billion, and with the increase in diagnoses that figure is rising dramatically. A key feature of an effective chemotherapeutic agent would be to target cancer cells while causing minimal harm to normal cells. Unfortunately, many current treatments exhibit serious side-effects. Our data show that COX-2 is an enzyme that can be targeted to selectively cause cell death in NMSC cells. COX-2 converts arachidonic acid (AA) and its ethanolamide derivative arachidonoyl ethanolamide (AEA) to prostaglandins and prostaglandin-ethanolamides, respectively. AEA and its novel metabolic product, I5-deoxy, I2,I4 PGJ2-EA (I5dPGJ2-EA), induce cell death in NMSC cells by activating the apoptotic cascade. Because COX-2 is overexpressed in NMSC but not normal keratinocytes, AEA is only metabolized to proapoptotic I5dPGJ2-EA in the tumor cells, thus conferring selective toxicity. We have developed a scheme for synthesizing endocannabinoids and endocannabinoid metabolic products with the goal of producing molecules with increased *in vivo* stability and activity. To develop the approach, we first synthesized AEA using arachidonic acid and ethanolamide as starting products. Using a uronium coupling reagent to form an amide linkage between arachidonic acid and ethanolamine, a 78% overall yield was obtained. The chemical structure of the synthesized AEA was verified by IH NMR spectroscopy. The activity of synthesized AEA was also examined by conducting MTS analysis. Similar to commercially obtained AEA, a concentration-dependent decrease in cell viability was observed. These findings suggest that the chemical groups within the structure of AEA can be further functionalized to allow the addition of other chemical groups without disrupting its chemotherapeutic activity. Thus, novel endocannabinoid derivatives can serve as useful tools for exploring prostaglandin metabolism and mechanisms of cell death.

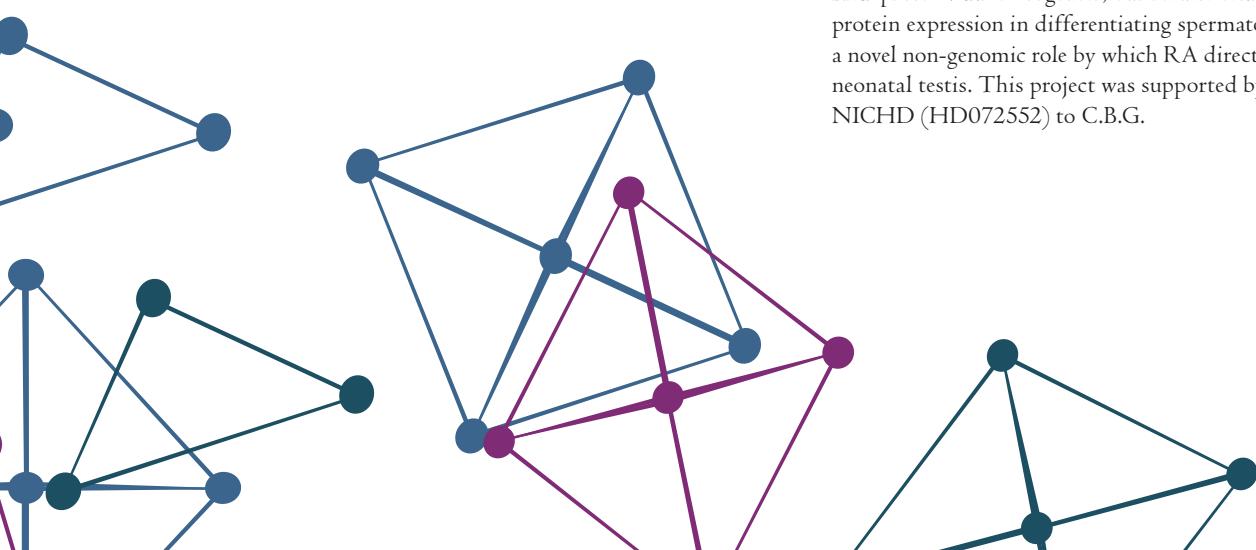
GO15

Retinoic acid (RA) Regulates Kit translation in Prospermatogonia in the Neonatal Testis: A Novel Non-genomic Mechanism of RA-regulated Gene Expression,

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At its most basic level, development is regulated by changes in gene expression. Although changes in mRNA abundance have been most widely studied, it is evident that not all mRNAs are translated into protein with similar efficiency. Indeed, mRNAs can be stored, inefficiently or efficiently translated, or targeted for degradation. The decision between these fates provides the cell with an important level of control over gene expression that allows for rapid and large-scale responses to changing environmental stimuli. We recently reported a global increase in cap-dependent translation as quiescent male germ cells (prospermatogonia) transition to spermatogonia after birth in the mouse, coincident with the onset of retinoic acid (RA) signaling at postnatal days (P)3-4. One of the mRNAs undergoing translational control is Kit, which encodes a receptor tyrosine kinase expressed in differentiating spermatogonia that is required for their entry into meiosis. In accordance with this, Kit mRNA is present both in the newborn testis and in undifferentiated spermatogonia without accompanying protein. There is currently no consensus as to when KIT is first expressed in neonatal spermatogonia, and it is unknown how expression of this critical molecule is regulated. We hypothesized that RA directs expression of KIT protein in differentiating spermatogonia by activating the PI3K/AKT/mTOR signaling network. We tested this hypothesis using a variety of *in vivo* and *ex vivo* approaches. We found that precocious exposure of PI neonatal mice to exogenous RA for 24 h stimulated KIT protein expression in germ cells by significantly increasing the polysome occupancy of Kit mRNAs without dramatically affecting total Kit mRNA levels. To determine the mechanism by which RA stimulates the translation of Kit we pretreated testis organ cultures with inhibitors of PI3K, PDK1, or AKT followed by RA treatment. Inhibition of any of these pathway components did not affect expression of STRA8, a transcriptionally activated target of RA, but blocked the expression of KIT protein. Taken together, our results establish RA as a driver of KIT protein expression in differentiating spermatogonia *in vivo*, and reveal a novel non-genomic role by which RA directs gene expression in the neonatal testis. This project was supported by a grant from the NIH/NICHD (HD072552) to C.B.G.



GO16

Structural Investigation of Pathogenic Transthyretin Amyloids using Solid-State NMR, Anvesh Kumar Reddy , Kwang Hun Lim¹,

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Transthyretin (TTR) is a homotetrameric protein with 127 residues in each monomer and is rich in -sheet structure in which eight B-strands are arranged in a -sandwich consisting of two -sheets (strands CBEF and DAGH). TTR is a transporter of thyroxine and retinol in serum and cerebrospinal fluid. Misfolding /unfolding of this TTR to form beta sheet rich amyloid is associated with numerous amyloid diseases. More than 100 mutations in the TTR gene have been found to cause transthyretin amyloidosis in which wild type (WT) TTR is responsible for senile systemic amyloidosis and some of the pathogenic mutants are known to cause TTR amyloid neuropathy and TTR cardiac amyloidosis. Considerable native-like structures were observed in the aggregation prone-states generated by local and/or global unfolding of natively folded proteins. Solid state NMR was employed to investigate whether the native structures are preserved in amyloid. Our solid-state NMR results have shown that -sheets (strands CBEF and DAGH) were maintained during amyloid formation. However, in the mutant (V30M) form of TTR a part of the D and A strands appeared to be disrupted. Additionally, in the AB loop, certain residues were appeared be distorted in the amyloid. Investigation of other parts of -sheets (strands CBEF and DAGH) are ongoing.

GO17

Defining a Novel Role for Noncatalytic Enzymes,

Jason Andrew Hoggard, East Carolina University, Greenville, NC

Members of the ADAM (A Disintegrin And Metalloprotease) protein family uniquely exhibit both proteolytic and adhesive properties. Specifically, ADAMs catalyze the conversion of cell-surface proteins to soluble, biologically active derivatives through a process known as ectodomain shedding. Ectodomain shedding contributes to normal, physiological processes, including fertilization, embryonic development, and immune response. However, aberrant ADAM function plays a pivotal role in pathological states, such as cardiovascular disease and cancer metastasis. Understanding how ADAM ectodomain shedding activity is governed could have a profound effect on how enzyme regulation is viewed.

ADAM metalloproteases are expressed in a wide array of organisms, from fungi to lower invertebrates and advanced vertebrate animals, and expression is not limited to a single cell or tissue type. Inexplicably, of

the forty ADAMs identified, thirteen are catalytically inactive. The noncatalytic ADAMs lack one or more consensus site (HExxGxxHxxH) elements in the metalloprotease domain, but retain the prototypical ADAM architecture. We posit that noncatalytic ADAMs regulate the activity of catalytically active ADAMs by competing for binding sites on substrates and/or receptors.

I used noncatalytic human ADAM7 and catalytically active human ADAM28 as a model ADAM pair to investigate the potential regulatory mechanism. ADAM28 and ADAM7 are strikingly similar; 67% identical and 78% similar with respect to the disintegrin domain at the protein level and they are selectively recognized by the same set of adhesion receptors. This functional similarity, along with being located in a cluster on chromosome 8p21.2, suggests ADAM7 may have arisen from gene duplication of ADAM28. While ADAM7 is noncatalytic, it lacks only a single residue within the active site. Using mutagenesis, I restored the active site and investigated the possibility that ADAM7 is a dormant protease retaining the structure required for catalytic activity. Here I show that restoration of the active site of recombinant ADAM7 bestows catalytic activity to a previously "dead" enzyme. The catalytic activity exhibited also displays specificity mirroring that of ADAM28. To our knowledge, this is the first demonstration that catalytic activity can be bestowed to noncatalytic enzymes and provides the first molecular evidence that noncatalytic ADAMs potentially arose from gene duplication of catalytically active enzymes.

GO18

MicroRNAs Targeting PPAR Pathways are Elevated in Bronchoalveolar Lavage (BAL) cells from Sarcoidosis

Patients and from Mice Bearing Carbon Nanotube Induced Granulomas, Matthew McPeak, Anagha Malur, Barbara Barna, Michael Fessler, Christopher Wingard, Yash Kataria, Mary Jane Thomassen, East Carolina University, Greenville, NC

Granuloma formation in the lung represents a complex and poorly defined response involving environmental and host factors that can culminate in persistent and chronic inflammatory disease. We established a murine model of multiwall carbon nanotube (MWCNT)-induced chronic pulmonary granulomatous disease which bears a striking resemblance to granulomas in sarcoidosis. At 60 days post instillation of MWCNT, bronchoalveolar lavage (BAL) cells exhibit increased pro-inflammatory cytokines and reduced peroxisome proliferator- activated receptor gamma (PPAR) - characteristics also present in sarcoidosis BAL cells. PPAR is a critical factor in lipid homeostasis but can also function as a negative regulator of inflammation. We hypothesized that down-regulation of PPAR pathways might involve microRNAs (miRs, small non-coding RNAs that post-transcriptionally repress mRNA). Investigation of BAL cells from 60-day MWCNT-treated mice indicated significant ($p < 0.05$) upregulation of both miR-33 (15-fold, $n=7$) and miR-27b (3.4-fold, $n=5$) compared to sham controls ($n \geq 4$). Elevated miR-33 (5-fold, $n=4$) and miR-27b (2.5-fold, $n=5$) were also detected in sarcoidosis BAL cells compared to healthy controls ($n \geq 3$). Because miR-27b

targets PPAR and miR-33 targets the PPAR-regulated lipid transporters ABCAI and ABCGI, (which also promote anti-inflammatory pathways) we investigated the status of ABCAI and ABCGI in BAL cells. In 60-day MWCNT-bearing mice (n=5), both ABCAI (-1.7-fold) and ABCGI (-2.0-fold) were significantly ($p<0.05$) decreased compared to sham controls (n=3). Lipid transporters were also significantly ($p<0.05$) reduced in sarcoidosis BAL cells: (ABCAI -4.3-fold, and ABCGI -3.4-fold, n= ≥ 5) compared to healthy controls (n=6). These results from studies in progress suggest that microRNAs 27b and 33 may promote chronic inflammation in pulmonary granulomatous disease by targeting anti-inflammatory PPAR pathways.

GO19

The Role of Dicer in the Restorative Macrophage Phenotype Signaling in Mouse Skeletal Muscle, *Sherri M Moore,
East Carolina University, Greenville, NC*

Sustained inflammation as a result to various types of injury (i.e, hepatitis C, chronic ethanol, steatohepatitis) is generally accepted to be the key prerequisite for tissue scarring (i.e, fibrogenesis). The interactions between the infiltrating immune cells and hepatic stellate cell fundamentally regulate collagen deposition. Reversal of fibrosis involves a cascade of infiltrating macrophages that express MMPs, which facilitate the breakdown of collagen matrix. Specifically, this project has addressed the macrophage-specific role of Dicer, central regulator of miRNA processing, in the development of restorative macrophages in vitro, the presence of restorative macrophages in liver fibrosis, and the resolution of hepatic fibrosis. The central hypothesis is that Dicer regulates the development of restorative macrophages that facilitate the resolution of hepatic fibrosis. Using the standard carbon tetrachloride (CCl₄) exposure model of liver fibrosis, liver was harvested at 1, 3, 5 days after the last dose of CCl₄. qPCR of Collagen gene expression from the in vivo model showed in both wildtype and MacDicer knockouts, a steady decrease after 0, 3, and 5 days post CCl₄ however the histology showed sustained collagen staining in the knockouts where there was evidence of resolution in the control. Furthermore, MMP gene expression levels were significantly blunted in the knockouts supporting the idea that MMPs facilitate collagen breakdown and aid in resolution of fibrosis and more importantly, suggesting dicer plays an intimate role in the development of macrophage differentiation. In a defined in vitro model of bone marrow derived macrophage differentiation, LPS+IFN- γ or IL-4 instructs bone marrow derived macrophages to differentiate toward distinct pro-inflammatory or anti-inflammatory phenotypes respectively however Dicer knockouts display a unique response that does not fall into the two classic phenotypes but displays its own distinctive phenotype (i.e. restorative) suggesting dicer is responsible for the recruitment and/or differentiation of macrophages. Furthermore, select Dicer-dependent transcripts have been identified by miRNA-mRNA associations to be involved in the role of the restorative macrophage. In conclusion, these experiments suggest a role of the restorative macrophage in the resolution of fibrosis. Moreover, the expression of dicer seems to be important for the restorative phenotype.

GO20

Human T-cell leukemia virus type I bZIP factor (HBZ) inhibits the transcriptional activity of the tumor suppressor p53, *Diana Grace Wright, East Carolina University, Greenville, NC*

Human T-cell leukemia virus type-I (HTLV-I) is a retrovirus that causes an aggressive T-cell malignancy called Adult T-cell Leukemia (ATL) in 3-5% of the infected population. After infection, the provirus is permanently integrated into the host cell genome. Hypermethylation or deletion of the viral promoter located in the 5' long terminal repeat (LTR) often occurs during the course of the infection, eliminating expression of all the viral proteins, at the exception of the HTLV-I basic leucine zipper factor (HBZ). HBZ is the only viral protein encoded in the negative strand of the provirus and regulated by a different promoter located in the 3' LTR. Therefore, HBZ is present in all infected and ATL cells. The tumor suppressor p53 is often inactivated in cancer cells. This factor responds to cellular stress by controlling cell cycle arrest, senescence, DNA repair, and apoptosis. While mutated p53 is only found in a small percentage of ATL patients, p53 is inactive in the cells of many leukemic patients and in most HTLV-I transformed cells. Acetylation of lysine residues on p53 by proteins with histone acetyl transferase (HAT) activity is essential for increasing p53 DNA binding activity at promoters of responsive genes. Different HAT proteins are known to acetylate p53 at different lysines, such as p300 and its parologue CBP, p/CAF and proteins from the Myst family. We previously found that HBZ interacts with the HAT domain of p300/CBP and inhibits acetylation of p53. To determine the effect of this inhibition, we treated cells carrying a wild-type p53 with etoposide to stimulate DNA damage and activate p53. We found that HBZ specifically inhibits acetylation of p53 by p300/CBP and reduces transcription of some p53-responsive genes. One gene down-regulated by HBZ is p21, a regulator of cell cycle progression that can arrest cell cycle after etoposide treatment. We found that cells expressing HBZ are able to bypass p21-cell cycle arrest. We hypothesize that HBZ contributes to the loss of function of p53 observed during HTLV-I infection.

GO21

Retinoic acid (RA) does not increase the stability of repressed mRNAs during spermatogonial differentiation, *Ellen K. Veltz¹, Jonathan T. Busada¹, and Christopher B. Geyer^{1,2}*

¹*Department of Anatomy and Cell Biology, Brody School of Medicine, and*

²*East Carolina Diabetes and Obesity Institute at East Carolina University, Greenville, NC.*

Spermatogenesis begins in the neonatal mouse testis with the transition of prospermatogonia (also termed gonocytes) into spermatogonia. A subset of spermatogonia become spermatogonial stem cells (SSCs), which produce progenitor spermatogonia. Progenitor spermatogonia differentiate in response to retinoic acid (RA) throughout the male reproductive lifespan to enter meiosis and ultimately become spermatozoa. Differentiation takes approximately 1 week, and is essential for both amplification of the spermatogonial population and preparation for their eventual entry into meiosis. However, little is known regarding the molecules and pathways involved in this process. This is primarily because there are few changes in the transcriptomes of undifferentiated and differentiated spermatogonia. We recently discovered that RA directs the translational activation of mRNAs that encode essential differentiation factors (KIT, SOHLH1, and SOHLH2) that are repressed in undifferentiated spermatogonia. Our current focus is identification of the mechanisms by which RA regulates translational activation of these mRNAs during spermatogonial differentiation. We hypothesize that mRNAs encoding KIT, SOHLH1, and SOHLH2 are repressed by degradation in undifferentiated spermatogonia, and that RA signaling enhances their stability (and therefore translatability) during differentiation. We developed a model to test this hypothesis, in which we inject pups with RA or vehicle (DMSO) at postnatal day (P) 1, 2-3 days prior to endogenous RA exposure. We then cultured isolated germ cells, blocked transcription, and harvested RNA at various timepoints afterwards. We used qRT-PCR to measure changes in RNA stability for a panel of genes (Fos, B2m, Sohlh1, Sohlh2, and Kit) in response to RA. We found that the changes in mRNA abundance for these genes do not differ greatly between the RA treated and vehicle control cells. The half-lives show a similar pattern, with the rate of decay changing only slightly in response to RA. These results indicate that RA did not affect the stability of mRNAs encoding critical determinants of differentiation that are repressed in undifferentiated spermatogonia. These results were somewhat unexpected, and suggest that there is a different mechanism responsible for enhancing the translation of these repressed mRNAs. This project was supported by a grant from the NIH/NICHD (HD072552) to C.B.G.

GO22

AEA Metabolite, I5d-PGJ-EA, Induces Apoptosis and Endoplasmic Reticulum Stress in Skin Cancer Cells, *Daniel A Ladin, Colin Burns, Rukiyah Van Dross, East Carolina University, Greenville, NC*

Skin cancer is the most prevalent form of cancer in the United States. Many epithelial cancers including skin cancer over-express the enzyme cyclooxygenase-2 (COX-2). COX-2 converts arachidonic acid to prostaglandins including prostaglandin E (PGE). The interaction of PGE with the EP receptor has been shown to promote cancer by activating anti-apoptotic signals and angiogenesis. In contrast, the COX-2 metabolic product, I5deoxy-I2,I4-prostaglandin J (I5d-PGJ) is reported to inhibit cancer cell survival by promoting apoptosis via mechanisms including oxidative and endoplasmic reticulum (ER) stress. Arachidonylethanolamide (AEA) is an endogenous cannabinoid that causes cell death in numerous cancer cell lines. Our lab previously demonstrated that AEA causes ER stress-mediated apoptosis in skin cancer cells in a COX-2-dependent manner. Furthermore, mass spectral analysis of COX-2 metabolic products of AEA reveal the presence of a novel ethanolamide-conjugated J-series prostaglandin as the primary product. We hypothesize that the apoptotic effects of AEA are mediated by its primary cytotoxic metabolite, I5d-PGJ-EA. To determine if I5d-PGJ-EA mimics the effects of AEA we synthesized I5d-PGJ-EA using I5d-PGJ as a substrate. The synthesis was accomplished by using an uronium coupling reagent in the presence of ethanolamine with verification performed by H1-NMR. To evaluate the anti-tumor effects of I5d-PGJ-EA in skin cancer, BI6FI0 melanoma and JWF2 squamous cell carcinoma (SCC) cells were treated with 5μM I5dPGJ-EA and cytotoxicity was examined by MTS assays. JWF2 cancer cells displayed a 77% decrease in survival while BI6FI0 melanoma cells showed a 66% decrease in viability. To verify that cell death was due to apoptosis, cleavage of caspase-3 and cleavage of PARP was assayed by Western blot analysis. Significant cleavage of both caspase-3 and PARP was observed in the melanoma and JWF2 cancer cells, confirming apoptosis was in fact occurring. To evaluate one possible mechanism of apoptosis, we examined ER-stress production via CHOP10 expression. CHOP10 expression was significantly increased in both BI6FI0 and JWF2 cells. These data show that I5d-PGJ-EA induces ER stress and apoptosis in melanoma and non-melanoma skin cancer cells. Since AEA also induces ER stress and apoptosis, the cytotoxic effects of AEA appear to be mediated by I5d-PGJ-EA. As such, the AEA metabolite, I5d-PGJ-EA, may be an effective agent for eliminating skin cancer.



The Pentose Phosphate Pathway is Stimulated by Constitutively Active Ca2+/Calmodulin-Dependent Protein Kinase Kinase (CaMKK) in Mouse Skeletal Muscle, Jeremie L.A. Ferey¹⁻⁵ and Carol A. Witczak¹⁻⁵

¹Departments of ¹Kinesiology, ²Physiology, and ³Biochemistry & Molecular Biology,

⁴Brody School of Medicine, and the ⁵East Carolina University Diabetes & Obesity Institute, Greenville, NC

The pentose phosphate pathway (PPP) metabolizes glucose to produce NADPH for reductive biosynthesis and nucleotide precursors for DNA/RNA synthesis, thus linking glucose uptake to cellular growth. In mouse skeletal muscle, expression of constitutively active Ca2+/calmodulin-dependent protein kinase kinase (CA-CaMKK) for 2 wks increases glucose uptake and muscle mass. To date, no studies have examined whether CaMKK regulates the PPP in skeletal muscle. Our goal was to determine if CA-CaMKK expression stimulates the PPP in muscle. To assess this, plasmids containing CA-CaMKK or empty vector were transfected into tibialis anterior muscles using *in vivo* electroporation. After 2 wks, muscles were collected, and a metabolomics analysis performed to assess PPP metabolites. The results showed that CA-CaMKK significantly increased levels of ribulose (57%), ribose (48%), ribitol (41%), and sedoheptulose-7-phosphate (115%), while ribulose-5-phosphate/xylulose-5-phosphate and ribose-5-phosphate trended towards being increased (33% and 31%, respectively), suggesting increased PPP flux. Further supporting increased PPP activity, CA-CaMKK increased RNA levels 34%. To assess the mechanism underlying increased PPP activity, immunoblots were performed for the primary rate-limiting enzyme, glucose-6-phosphate dehydrogenase (G6PD). The results showed that CA-CaMKK increased G6PD protein levels 137%, collectively suggesting that chronic activation of CaMKK signaling stimulates the PPP in mouse muscle to supply nucleotides for RNA synthesis, conceivably by increasing G6PD expression. We propose that the PPP may be a key metabolic pathway linking CaMKK, glucose and protein metabolism in skeletal muscle.

The tumor suppressing function of TDAG8 in the acidic tumor microenvironment in lymphoma cells, Edward J. Sanderlin, Calvin R. Justus, Li V. Yang, Division of Hematology/Oncology, Department of Internal Medicine, Brody School of Medicine, East Carolina University, Greenville, NC

The reput of the tumor microenvironment is that of regional acidosis due to deregulated cancer cell metabolism. Acidosis within the tumor microenvironment can have both tumor promoting and inhibiting effects much depending on the duration of acidotic stress. The T-cell Death Associated Gene 8 (TDAG8), a family member of the proton-sensing G-protein coupled receptors, has the ability to sense protons in the extracellular milieu and transduce intracellular signaling through G-proteins to modulate tumor cell function. The role of TDAG8 as possessing tumor promoting or suppressing functions is unclear and much dependent on cell type and biological context. Here we provide evidence supporting TDAG8 function in two lymphoma cell lines, Ramos and U937, as possessing a tumor suppressor function by sensitizing these cells to apoptosis and slowing cell cycle progression upon acidotic activation of TDAG8. After stably overexpressing TDAG8 in Ramos lymphoma cells, we observed a sharp increase of intracellular acidity as a result of treatment of media buffered to pH 6.4. This decrease in intracellular pH likely contributes to DNA damage, ultimately causing cell cycle inhibition and apoptosis. Furthermore, a clear induction of cleaved PARP and DNA fragmentation was observed upon treatment of media buffered to pH 6.4 in Ramos cells. These data indicate activation of TDAG8 in Ramos cells increases sensitization to acidosis and induces apoptosis. To test this hypothesis *in vivo*, we used a tumor xenograft model and performed subcutaneous injections with Ramos and U937 cells overexpressing TDAG8. We observed a clear reduction in average tumor mass and growth in tumors overexpressing TDAG8 when compared to tumors expressing the control vector construct. Collectively, we propose a role for TDAG8 in Ramos and U937 lymphoma cells in inhibiting tumor cell growth and viability.



GO25

Fast and accurate portal image prediction by Monte Carlo simulation for a clinical linac, Jihyung Yoon and Jae Won Jung, East Carolina University, Greenville, NC, Jong Oh Kim, University of Pittsburgh Cancer Institute, Pittsburgh, PA, Inhwan Jason Yeo, Loma Linda University Medical Center, Loma Linda, CA

Purpose: To develop and evaluate a fast electronic portal imaging device (EPID) simulation model for a clinical linac based on its structure and elemental composition. Currently the most accurate EPID model is EGS Monte Carlo (MC) code based virtual detector, by the supporting of atomic number in the code. However, its long calculation time prohibits its application on clinic. We aim to develop a fast EPID simulation model based on XVMC, which substitutes materials as water equivalent, while maintaining accuracy as virtual detector model. **Methods:** An EPID model on the XVMC code was previously developed by density scaling of EPID structures. It was modified in this study by effective atomic number (Z_{eff}) correction to consider probability of Compton scattering to improve accuracy of portal image simulation. In addition, pre-generated phase space files from EGSnrc/BEAMnrc were adopted for the XVMC model in order to improve penumbra shape. The model was compared with a reference virtual detector model, which was transformed in EGSnrc/DOSRZnrc code. The two models were extensively tested under various thicknesses of homogeneous and heterogeneous phantoms, as the calculations on models were compared with measurements on EPIDs. The heterogeneous phantoms were composed of 5 cm-thick lung phantom or 3 cm-thick bone phantom sandwiched by plastic water phantoms. The field sizes were varied from 5 x 5 cm² to 15 x 15 cm². **Results:** Both XVMC and virtual detector models showed differences smaller than 1% from the measurements under homogeneous phantoms on an average that was calculated across in-field regions, while showing a maximum point difference of 2.3 % by the XVMC model and 2.0 % by the virtual detector model. Under heterogeneous phantoms, the two codes exhibited differences less than 1.0 % on an average. The XVMC model showed a maximum point difference of 1.8 % and the virtual detector model showed 1.9 %. The Z_{eff} -correction and adoption of new phase space file on the XVMC model resulted in the performance of the XVMC model as good as that of the EGSnrc model, while calculation times were remarkable reduced by ~100 times; for a desired accuracy, the calculation time for the virtual detector model was ~48 hours, while it was ~0.5 hour for XVMC model. **Conclusion:** The new XVMC model showed good agreement as the virtual detector model and can be used clinically for fast calculation of EPID image simulation.

GO26

Interleukin-6 Secretion of Human Skeletal Muscle of Lean and Obese Populations, Ashleigh Alyse Israel, Department of Kinesiology, East Carolina University, Greenville, NC

Efforts to study blood glucose regulation during physiological conditions mimicking exercise have shown that Interleukin-6 (IL-6) is an anti-inflammatory cytokine released in active skeletal muscle cells that aide in mediating the whole-body glycemic condition (Pedersen & Febbraio, 2008). The exercise-induced production and release of IL-6 increases insulin action in the skeletal muscle in response to an increased demand for glucose by the cell (Carey, Steinberg, Macaulay, & Thomas, 2006) (Carey, Steinberg, Macaulay, & Thomas, 2006) (Carey, Steinberg, Macaulay, & Thomas, 2006). Lean populations exhibiting normal insulin-sensitivity show enhanced glucose uptake and glycogen synthesis in skeletal muscles, under resting and insulin-stimulated conditions (Carey et al., 2006). This exercise-induced mechanism for glucose control may pose a problem for obese individuals who may not be as insulin-sensitive as lean individuals. At rest, adipose tissue is a major source of IL-6 in circulation. It has been assumed that due to their larger fat mass, obese populations have higher concentrations of IL-6 in circulation.

The purpose of this study was to determine if IL-6 concentration differs in the skeletal muscles of lean and obese populations under basal and exercise-induced conditions. Primary human skeletal muscle cells were sub-cultured through cell passage and differentiated into multinucleated myotubes. Cells were stimulated continuously via electrical pulse stimulation (EPS) for 24 hours to mimic in-vivo physiologic exercising conditions. IL-6 concentrations at basal and exercising conditions were measured using a chemiluminescence immunoassay (Beckman Coulter, Inc). Preliminary data have shown that in lean subjects, basal IL-6 concentrations ranged from 59.09 – 290.97 pg/mL, while exercising concentrations of IL-6 ranged from 177.43 – 2496.68 pg/mL. In obese subjects, basal IL-6 concentrations ranged from 97.29 – 1022.85 pg/mL, while exercising concentrations of IL-6 ranged from 698.88 – 3604.36 pg/mL. Preliminary data from this study show strong evidence to support that basal concentrations of IL-6 differ in lean and obese populations. However, there is insufficient evidence to support that IL-6 concentrations are statistically different in lean and obese exercising cells.

GO27

Activation of the Prostanoid EP3 Receptor Mediates Central Nicotinic Acid-Evoked Pressor Response in Conscious Rats, Samar A M M Rezq, Abdel A Abdel-Rahman, East Carolina University, Greenville, NC

Nicotinic acid (NA) produces prostaglandins (PGs)-dependent flushing via GPR109A activation. Although NA crosses the blood brain barrier, there are no reports on GPR109A expression or function in blood pressure (BP) controlling nuclei; e.g. the rostral ventrolateral medulla (RVLM). We built on GPR109A expression in the RVLM by showing

in conscious rats that intra-RVLM NA (20 µg/rat) led to a biphasic BP elevation. The first pressor phase (within 1 min of injection) resembled intra-RVLM L-glutamate mediated pressor response, and was abolished by the N-methyl-D-aspartate receptor (NMDAR) blocker (2-amino-5-phosphonopentanoic acid; APS). We hypothesized that the longer lasting second pressor phase (5-15 min after NA injection) is mediated via local PGs release. The finding that the prostanoid EP3 receptor subtype blocker L-798106 abolished the NA-evoked delayed pressor response supported our hypothesis. NA increased L-glutamate level in PC12 cells, which exhibit neuronal phenotype and express GPR109A. The BP and biochemical effects are GPR109A dependent because they were not reproduced by the NA isomer isonicotinic acid, which lacks the receptor activity. These novel findings suggest that both L-glutamate and PGs release are involved in NA-mediated pressor response and that GPR109A is the main target for NA central actions. Ongoing GPR109A knockdown studies, direct measurements of PGs levels, and the effect of other EP receptor blockers on NA-mediated pressor response will solidify the molecular mechanisms implicated in RVLM GPR109A involvement in BP regulation. The present findings are clinically relevant because they elucidate a mechanistic role for GPR109A in the central BP regulation and highlight central GPR109A blockade as a potential antihypertensive strategy.

for the neuroprotection in attenuating PIPN in vivo. To extend our discovery to a tumor-bearing animal model, we employed the Lewis Lung adenocarcinoma (LLC) in syngeneic C57BL/6 mice. Starting drug treatment 12 days post LLC injection, groups receiving cisplatin (with or without Y-27632) had significantly slower subcutaneous tumor growth compared to untreated mice or mice treated with Y-27632 only. Significant PIPN by Von Frey assessment was first evident at week 4. By week 5, cisplatin-treated mice showed significantly decreased touch sensation compared to mice treated with cisplatin+Y-27632 and naïve mice. An independent experiment was recently performed with increased dosage of Y-27632 and starting cisplatin treatment 5 days post LLC injection. Tumor-bearing mice had cancer growth rates similar to the previous experiment but showed a higher survival rate. The Von Frey data demonstrated a similar trend. These data support the hypothesis that concurrent blockade of Rho GTPase signaling protects mice from PIPN. This clinically applicable drug regimen may help decrease debilitating neuropathy in patients, thus not only improving the quality of life but also allowing completion of chemotherapy to maximize the potential for cure. Supported by NIH-CA165202, AlzNC, and The Wooten Foundation.

GO28

Rho GTPase Signaling: A Neuroprotective Target for Attenuating Chemotherapy-Induced Peripheral Neuropathy,

George A Howard IV¹, Yi Zhu²*, Keith Pittman¹, Amy Friesland², Kathryn M Verbanac¹, and Qun Lu^{2,3}*

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Chemotherapy-induced peripheral neuropathy (CIPN) is the most common form of anti-cancer drug-associated neurotoxicity. It is now clear that both traditional cytotoxic chemotherapy drugs and contemporary targeted anti-cancer agents can lead to peripheral neuropathy. However, there are currently no FDA-approved and effective interventions or preventions for CIPN, which underscores the need for research breakthroughs in the field.

To address this clinically urgent problem, we have previously shown that suppression of RhoA signaling, which is known to inhibit cancer cell invasion, can reverse anti-cancer drug-induced neurodegeneration in vitro. Subsequent studies demonstrated that RhoA suppression by a selective pI60ROCK/Rho kinase inhibitor Y-27632 facilitates neural recovery in the platinum-induced peripheral neuropathy (PIP) mouse model developed in our laboratory. Recently, we further demonstrated that LMIIA-3I, a small-molecule ligand of the p75 neurotrophin receptor (p75NTR) that lies upstream of RhoA signaling, prevented PIPN in mice, thereby solidifying the concept that Rho GTPase signaling is responsible

GO29

Mitochondrial Respiration is Attenuated in the Ischemic Muscle of Genetically Susceptible Mice, Cameron Alan Schmidt, East Carolina University, Greenville, NC

Peripheral arterial disease (PAD) is a non-coronary occlusive disease, typically referring to atherosclerosis of the lower limb(s) that affects millions of people world wide. Treatment options for patients suffering severe PAD are focused exclusively on revascularization of the occluded vascular bed(s) and are only moderately efficacious in treating the disease, which frequently results in major amputation. Murine models of ischemia have demonstrated the role of genetics in the manifestation of arterial disease pathology. C57BL/6J (BL6) inbred laboratory mice are protected against acute ischemic limb tissue loss, while BALB/c (B/c) mice respond to the same ischemic condition poorly, suffering extensive limb necrosis. We hypothesized that the skeletal muscle mitochondrial response contributes to the severity of ischemic pathology in a genetically dependent manner, and thus may constitute a novel therapeutic target. Mitochondrial respiration was measured in vitro, in vivo, and ex vivo using high-resolution respirometry following induction of acute ischemia/hypoxia. Limb perfusion in vivo was measured with scanning laser doppler flowmetry. Ischemia resulted in greater limb tissue necrosis and attenuated limb perfusion in B/c mice compared to BL6. Though no differences were observed between the parental strains at baseline, post ischemic mitochondrial respiration in isolated muscle mitochondria was decreased significantly only in B/c mice after ischemia, compared to contralateral non-ischemic control limbs. Respiration deficits were further confirmed in B/c primary muscle cells after experimental ischemia/hypoxia in vitro. Interestingly, isolated mitochondria from healthy mice demonstrated similar strain specific deficits after experimental ischemia/hypoxia ex vivo. Dominance of the nuclear encoded BL6 protective allele was evaluated in skeletal muscle mitochondria using tissue and cells from F1 (C57BL/6J X BALB/cJ) generation mice, in which the mitochondrial genome was contributed by the B/c maternal line. These intriguing results support the possibility that some patients may be genetically predisposed to a dysfunctional muscle mitochondrial response to acute ischemia, which may exacerbate tissue pathology and/or render revascularization largely ineffective. Furthermore, our results indicate muscle mitochondria and electron transport system function as potential novel therapeutic targets for the alleviation of PAD pathology.

GO30

PRESENTATION WITHDRAWN

GO31

Animal Instinct, Dru Lindsey Patrick, East Carolina University, Greenville, NC

My research addresses the question: What makes me feel powerful? Being barraged with weekly updates on shootings, strong-armed robberies, and sexual assault, not only in world news but often

right down the street, has caused me to become hyper-aware of my surroundings and to explore my options for defending myself. Through my research I have found similarities between our man-made defense weapons as well as makeshift tools and the natural self-defense mechanisms of animals and insects.

My work uses animal symbolism in an attempt to portray the ways in which we, as humans, cope with the fear of our own species; a way in which we anticipate becoming prey to violence and how we empower ourselves in the process. Through creating wearable hybrid self-defense pieces inspired by animals I attempt to start a discussion on violent crime, the need to defend one's self, and empowerment, as well as being a narrative to my own fears and experiences

GO32

Jazz on broadway, Gregory Bailey, East Carolina University, Greenville, NC

My work is a synthesis of an analysis of "the conjunction and juxtaposition of forms". The reaction of one object being placed in proximity or "colliding" with another is the primary visual, tangible and philosophical result that the viewer experiences. It is the desire of this concept to create works that evoke emotion, convey a sense of place, and an understanding of themselves to those who view them. The project is to be titled "Jazz on Broadway" and through abstracted imagery I wish to convey a sense of the vibrancy and excitement of this musical genre. I have chosen to express this through the medium of sculpted and cast in place colored and textured concrete creating forms evoking musical instruments with stainless steel "trim" and fixtures to provide life and movement through a play of texture and reflection from this material. The scale of the project will be human with ease of maintenance featured fully in the design.

GO33

A Cycle of Prints and Enameling Jewelry, Sarah Kathryn Loch-Test, East Carolina University, Greenville, NC

My enamel and jewelry work focuses on the industrial cities of America's 'Rust Belt' region and their abuse of natural resources; offering permanence to stages of decay and regrowth.

Over the summer of 2014 I visited various sites in Cleveland, OH to gather information, imagery and materials for a project combining printmaking and enameling. Images are etched on copper plates and printed on paper. The plates are manipulated by metalsmithing techniques, which ultimately 'destroys' them. Pieces of the plates are finally repurposed in enamel jewelry, ending the cycle.

My research included documenting the urban landscape and nature reserves, and accessing archived photographs. In this presentation I will cover the historical significance of these locations in relation to my interest in the Rust Belt region's industrial past and tensioned relationship with nature as well as how this research has been translated into prints and enameled jewelry

GO34

Love Story Between An Artist And A Hunch, *Amber D Watts,
East Carolina University, Greenville, NC*

The term intuition is known to have a dirty reputation in many areas of academic study, including art. It is seen as frivolous and imbedded in magic. Intuition is tied to emotion, which implies that it is irrational. Despite popular belief, intuition plays a central role in the process of logical reasoning. In fact, intuition is so delicately intertwined with logical reasoning that a person could not function in their day to day lives without the presence of both. In the following presentation I will delve into the critical role that intuition plays in problem solving for art and life. I will give specific examples as well as discuss a recent artwork I created while openly using intuition to guide art materials and concepts.

GO35

The Self, *Greg Banks, East Carolina University, Greenville, NC*

What the camera records is something more transcendental than my memory of the experience. Being on both sides of the camera feels like an out of body experience. When I consider moving on from self-portraiture, something magical happens to make me take another image. Through long and multiple exposures the camera will capture a sense of myself in this world but also my transition into another realm.

GO36

Muslim Women in Western Context, *Abir Bashir Abumohsen,
East Carolina University, Greenville, NC*

It is my intention to reveal various cultural practices that define Middle Eastern Muslim women in American or Western societies. As a 1.5 generation Middle Eastern woman, this political topic has a great impact on my life and the lives of many other Muslim women who live in western societies. The recurring negative presentations of Islamic culture and Islamic traditions, and the emphasis on worst case scenarios construct a negative generalization of the role of women in Islamic societies. Along with the political tension between the Middle East and the West, such views only add to the rise of political boundaries between the two cultures rather than resolving any issues.

Within this cultural context, realizing the factors which contribute to this issue becomes essential to sustaining a democratic balance in our international and local community. One of these factors is understanding of the cultural lens when viewing the issue of feminism on both sides, east and west. Another points out specific media coverage, including art, that discusses the topic through a western lens. In my work I demonstrate the concepts concerning these issues by using cultural indicators, including mainstream images of Muslim women portrayed in the Western culture.

GO37

Fresh Tracks, *Joe Mannino, East Carolina University, Greenville, NC*

Being out in the landscape is hard to describe. I feel comfortable; I feel like I belong, I feel normal. I feel alive; primal. I hike and sweat, my back soaked underneath my heavy pack. I'm not carrying a burden, however. If I were carrying that load up stairs, in an urban environment, it would be unbearable; out in the landscape, I don't even feel it.

Through creating a visual record of my experience as a hunter I am acknowledging the fellowship between land and my family and the importance of keeping them attuned to one another.

GO38

"How to Lose Yourself in 10 Days", *Alexandra Ingle,
East Carolina University, Greenville, NC*

Cue man in vulnerable state of desperation, dim lights to a night's sky full of bright stars, pluck the heartstrings of sentimental sound and epiphany, and...ACTION! "Shut up, just shut up. You had me at 'hello'." (Jerry McGuire) My current research is focused on a sarcastic approach to American ideals of successful romantic relationships. False expectations occur with this notion of "successful" seen in media, entertainment, and movies, and my research is based on those second-hand societal standards. Through investigation, I have become aware of the negative consequences of romantic expectation such as: gender roles, identity loss, sexism, feminism, and machoism. To communicate the edgy and serious topic, my approach is presented through humor. Humor is perceived immediately and enables a connection to something or someone. By establishing a relatable emotional response through humor, my work is inviting, allowing a deeper reflection to the serious concept.

To communicate my model of romance and the expectations that couple with it, I create ceramic figurative sculptures. The figures I create have a narrative; they convey a specific moment of time within a story. I rely on cliché's and "truisms" such as, "he loves me, he loves me not" as a starting point for the narrative I choose to work with. I often mock, or poke fun at these relatable phrases to question the "truth" or significance of their meaning in hopes of the viewer reexamining their own notions of "successful" romantic relationships.

GO39

“Beyond Anatomy in Figurative Sculpture”, *Chris Elizabeth Morgan, East Carolina University, Greenville, NC*

What makes a figurative sculpture extraordinary? In my current exploration of sculpture, I am attempting to create fluidity and movement, and enhance the energy emanating from the form, to depict the desired emotion of the piece. Last year, I cast four bronze sculptures based on figurative representations of historical rivers. During this process, I discovered that although they were strong anatomically, I wanted the figures to express more fluid lines, more gesture and greater emotion. I continue to work on strong anatomic form, which is the foundation onto which emotion is layered through gesture and expression; however, I want the viewer to grasp the concept and, only after seeing the emotion and beauty of the figure, realize that the anatomy is correct. Moving beyond the anatomy, to gesture, emotion and concept is what makes a figurative sculpture speak; it's what makes the sculpture exceptional.

GO40

Letter of the Law: A Study of Biblical Holiness Code and Its Application to Modern Life, *Hosanna Rose Rubio, East Carolina University, Greenville, NC*

Anyone with a television knows that there is a raging debate going on in this nation, a debate about religion, morality, and the laws we enact to govern these issues. Growing up in a fundamentalist family has made me acutely aware of this debate, as well as the scriptures that it draws on for support, which ultimately culminates in a single passage: “It is easier for heaven and earth to pass away than for one letter of the law to be overturned” Luke 16:17.

The current conversation in Christianity focuses on small details that have little to do with the rest of the text, citing the infallibility of the scriptures as their support, while ignoring any parts that feel out of date or inconvenient. My frustration with this situation has lead me to my current body of work, which illustrates passages from the Bible that range from offensive to downright ridiculous, and are rarely practiced.

GO41

Methods of Communication, *Christine Dale Zuercher, East Carolina University, Greenville, NC*

I am investigating historical forms of communication and the methods we use to convey messages and overcome distance. My research on shortwave radio includes various forms of correspondence including stamps, telegrams, maps, shortwave shipping forecasts, spy codes, and a growing collection of the QSL cards that shortwave operators send to each other. Greenville, North Carolina is home to the last government owned shortwave radio station in the United States. Struck by the solitude and

meditation of a location transmitting thousands of dots, dashes, beeps, and sounds through the air a second, the silence present at each location is astonishing. I photograph and collect a part of our history that is being forgotten.

The current conversation in Christianity focuses on small details that have little to do with the rest of the text, citing the infallibility of the scriptures as their support, while ignoring any parts that feel out of date or inconvenient. My frustration with this situation has lead me to my current body of work, which illustrates passages from the Bible that range from offensive to downright ridiculous, and are rarely practiced.

GO42

Ceramic Design for Social Serving Ware, *William Gaines Bailey, East Carolina University, Greenville, NC*

I am investigating how hand-crafted ceramics can fit the demands of public events in both functional and decorative capacities. The work is particularly focused on mobile dining situations such as gallery receptions. In addition to the body of work created for the gallery space, prototypes of dishes designed for social events at other venues are designed. The contextual research for this project includes historical analyses of social serving ware, interviews with gallery owners, caterers, and event attendees, as well as real world testing of the pieces. The work addresses the demands and parameters for events and the corresponding venue; investigating how handmade ceramics can solve issues of usability, aesthetic opportunities, and waste management. The subsequent goal for this project is to serve as a model that could be replicated at future public events.

GO43

A Family Scattered: Rejoining the Disjoined, *Sarah Harvell, East Carolina University, Greenville, NC*

The separation from family is an unavoidable process of life; memories of family throughout my childhood have sparked the desire to have those moments present once again. Nostalgia is a theme used throughout my work and each piece I craft represent a memory or place associated with my family.

I seek closure through the act of crafting functional copper objects using metal forming techniques to manipulate metal from a flat sheet to a three dimensional form. My work recognizes the impact memories have on my life and the desire to forget or cherish a moment in time. Each piece honors a memory, feeling, or event and connects each to a physical and tangible object.

I have chosen to honor my family tradition of coming together for the evening meal. By making functional dinnerware pieces to share with each member of my family the tradition may be continued through the tangible nature of the objects I craft no matter the distance or time that passes.

GO44

Rape Culture, Alyssa Anne Karpa, East Carolina University, Greenville, NC

Rape culture is a term that was invented in the 1970's to provide a name for the way in which society blames victims of sexual assault and creates the idea that male sexual violence is a norm. Although the term was coined in 1970, this societal belief is far from new. It is a problem that is deep rooted in our country's history and the way in which the role of women has evolved.

I will comment on the way rape culture affects our society and the manner in which our society is formatted to allow rape culture to exist. I will also discuss the fact that rape is not limited to women—although far less are reported, many men suffer from rape, as well. From here, I will discuss how the artwork I create is related to the subject as well as how I plan to use my work to promote education and an open forum for victims of rape culture to discuss their stories and seek out help if needed.

GO45

Anthropology and Technology: How Can Cultural Heritage Digitization Increase the Publics' Understanding of the Past, Hannah Sophia Rawcliffe, East Carolina University, Greenville, NC

During the summer months of 2014, I worked 8 weeks as an intern at the Institut de Recherche en Communications et Cybernétique de Nantes (IRCCyN) at the École Centrale de Nantes. During that time, I participated in the digitization of a scale model of the city of Nantes to create an interactive, virtual reality interface. This presentation will introduce the audience to the process of cultural heritage digitization, including file reduction, cleaning, and geo-locating specific points, and review the advantages and disadvantages of specific software applications. I will discuss the need for the combination of technological and anthropological knowledge in this emerging field. Furthermore, I will argue for the need of digitization to preserve the past and educate future generations.

GO46

Hybrid Health: An Analysis of a Foundations Curriculum

Personal Health Course, Johnny Signorelli, Beth Chaney, Victor Aeby, Debra Tavasso, Health Education and Promotion, East Carolina University, Greenville, NC

Hybrid courses are becoming increasingly more common at the university level. With this type of course comes questions about the effectiveness of each method of instruction (face-to-face and online) when used concurrently. The available literature supports a hybrid format for many university subjects; however, research in this area with a personal health course is lacking. The purpose of this study is to determine if there was a significant difference in knowledge gained through each method of instruction experienced by students in a foundations curriculum personal

health course. The hybrid design of the course in this study allows for analysis between face-to-face and online instruction within the same group of students. Results from a two-way ANOVA show no statistically significant difference between knowledge gained through each method of instruction. The findings support the use of a hybrid format in personal health courses and future studies to determine what makes these hybrid health courses most effective.

GO47

Callous-Unemotional Traits and Salivary Oxytocin in Maltreated Adolescents and Young Adults, Emmi Scott and Jeannie Golden, East Carolina University, Greenville, NC

Callous unemotional (CU) traits are characterized by low levels of emotional reactivity, including a lack of empathy, guilt, and concern for others (American Psychiatric Association, 2013). Compared to other antisocial youth, those with CU traits display more severe and persistent proactive (i.e., instrumental) aggression, placing them at high risk for development of psychopathy in adulthood. Extant literature suggests that individuals with CU traits show unique biological, neurocognitive, and emotional characteristics that reflect distinct etiological factors (e.g., Frick, Ray, Thornton, & Kahn, 2014). Evidence is also mounting that dysregulated oxytocin levels play a role in the development of CU traits (Fries et al., 2005). Oxytocin is a neuropeptide known for its role in empathy and attachment (Gordon et al., 2013), and low endogenous levels have been associated with emotional maltreatment as well as lifelong interpersonal callousness and aggression (Beitchman et al., 2012; Lee et al., 2009).

The purpose of the present study is to investigate the extent to which salivary oxytocin and maltreatment factors (e.g., type, severity) independently contribute to the variability in CU traits. We hypothesize that low levels of salivary oxytocin will be predictive of high CU traits as assessed via self-report and caregiver-report using the Inventory of Callous-Unemotional Traits (Frick, 2004), and that CU traits are positively associated with maltreatment severity and proactive aggression as assessed by the Reactive Proactive Aggression Questionnaire (Raine et al., 2006). Maltreatment severity is evaluated using a modified Maltreatment Classification Scheme (Barnett et al., 1993) based on the type, duration, intrusiveness, and age of child. If the above hypotheses are supported, we will evaluate oxytocin as a mediator of the relationship between maltreatment and CU traits. Participants will include approximately 100 adolescents and young adults who have experienced childhood maltreatment or disruption in the parent-child relationship (e.g., frequent changes in caregivers). Salivary samples are immediately stored at -80°C in the Behavioral Neuroscience Lab until shipped to the University of North Carolina for assay via enzyme-linked immunoabsorbant assay (Oxytocin ELISA Kit; Enzo Life Sciences). This presentation will review extent literature on the association between oxytocin and CU traits and preliminary data from this ongoing study.

GO48

Early Childhood Administrators' Attitudes and Experiences in Working with Gay and Lesbian Families., Julie Weston Church, East Carolina University, Greenville, NC

The number of gay and lesbian (GL) families is ever increasing in our nations education settings. Early childhood settings, specifically, are among the first type of educational settings these families experience. With the growing number of children coming from GL families, it is imperative that education professionals, especially administrators, are prepared to support and include these families in the classroom. Research demonstrates a lack of training on this topic and neglects to address how administrators are actively creating welcoming, inclusive environments for GL families. This study aims to examine the attitudes, comfort, preparation, and current practices of early childhood administrators working with GL families. Through a theoretical lens of Bronfenbrenner's Ecological Systems Theory, early childhood administrators in their own four- or five-star early childhood centers across the state of North Carolina were surveyed, using a demographics survey, Attitudes towards Lesbians and Gay Men (ATLG) scale, and a revised version of the School Professional's Attitude towards Homosexuality (SPATH) scale to determine individual attitudes, comfort, and preparation to work with GL families. Additionally, the SPATH measures the use of inclusive strategies within the administrator's center, which has not been measured to date. Data is still being collected, with responses received from over 200 participants so far. Both quantitative and qualitative is being collected and will be analyzed in meaningful fashion. Based on the previous work that has been conducted by the researchers on closely related topics of LGBT families and schools, we presume there will be several implications that will stem out of this project. Future research on this topic will be necessary to better understand the experiences of GL families in early childhood settings.

GO49

Exploring the Attitudes and Behaviors of African American Tourists, Charis Nicole Tucker, East Carolina University, Greenville, NC

The United States is experiencing a shift in racial demographics. Recent projections suggest that minority groups will make up nearly 50% of the population by 2023. Such increases have made the topics of race, ethnicity, and culture an appealing area of study for researchers and tourism professionals alike. Despite such interest, there are still large gaps in literature about African American Travel Trends. Existing explanations of differences in African American travel suggest that decisions are made due to marginality (generally economic) or ethnicity (subcultural values). Neither explanation takes into account the longstanding history of prejudice and discrimination experienced by African Americans and its potential effect on current attitudes and behaviors. Because travel preferences may be a byproduct of learned behaviors passed down through

generations, it is imperative to understand both current and historical aspects of leisure behavior.

Despite recommendations dating as far back as 1978, additional gaps persist regarding the existence of actual stories detailing the experiences of African American travelers. Breaking away from the traditional statistical data, this study will explore the development of attitudes and behaviors of African American travelers. For the purposes of this study, data will be obtained through 15 semi-structured interviews. The participants in this study must self-identify as an African American, take at least 1 trip per year and represent one of three generational groups: baby boomers, generation x, generation Y. Capturing the voices of African American travelers offers a more inclusive understanding of their travel experiences, while at the same time offering explanations between the relationship between race and tourism.

GO50

Surviving the Mean Girls: Relational Aggression in the Workplace, Courtney E Sparks, East Carolina University, Greenville, NC

Mean Girls is a movie in which a group of high school girls formulate intentional relationships and bonds with one another that circulate around hidden agendas. Often these relationships are superficial and utilized as a tool by an exclusive few to feed their individual needs in intimidating social situations in which power, superiority, and dominance is desired. These relationships are often fueled by a term known as relational aggression. Relational aggression (RA), is indirect social aggression, and is a subset of bullying usually involving women. RA is "designed to harm another through the exploitation of a relationship". This destructive social pattern does not end on graduation day. Instead, RA proves to be a socially acceptable way to dominate and control others without accepting personal responsibility. Unfortunately, relational aggression is almost impossible to identify for those who are not trained. Thus, RA becomes and a manipulation instrument that people, particularly women find useful in their social lives but as stress levels increase in their job, is also useful and, ironically, rewarded in their workplaces. The purpose of this research is to identify issues associated with relational aggression in the workplace while exploring literature on women dominated fields, such as, nursing, teaching, and social work. It is believed that this subset of workplace bullying may be more crippling and hazardous for the targeted individuals than the effects of all other work-related stressors combined. The Cochrane systematic approach was used to identify key literature and data relating to the terms: workplace bullying, policies and social work. Major findings include the ambiguity that exists with the conceptualization of relational aggression; workplace and bullying aggression has damaging impacts on the work atmosphere and the individual's well being. In conclusion, the reviewed research suggests that actions should be taken to bring attention to the issue of relational aggression as it relates to its predominance in the workplace. More importantly, professional organizations and college campuses should offer specialized trainings that bring awareness to relational aggression specifically focusing on identification, prevention, intervention, and skills to survive the current Mean Girls phenomena.

GO51

Agrarian Transition: Greenhouse farming technology and the production of new farmer identity in Jamaica, *Alex A. Moulton, East Carolina University, Greenville, NC*

Rural identity in the Caribbean has been indelibly shaped by the struggles of small scale farmers sparring with nature to eke out their livelihood. Such farmers have generally been seen as backward and inefficient, and have therefore been the target of interventions by government and development agencies aimed at enhancing their efficiency and productivity. Through these programs of farmer advancement and rural development, considerable attention and resources have been directed towards the creation of modern model farmers. In Jamaica, the promotion of greenhouse farming technology since the early 2000's represents the latest of these kinds of initiatives. In this paper, I examine the deployment of this technology, which has been hailed by some of its promoters as the next step in the progression of the island's post-colonial agrarian history. Drawing on Foucauldian notions of power, I argue that this new greenhouse driven agricultural model is underwritten by a green governmentality seeking to create new subjectivities. I suggest that the discourse around the technology reinforces longstanding conceptual differences between small scale farmers and their more socially and financially endowed counterparts. The end result, I argue, is that greenhouse farming technology has initiated a process of agrarian change the implications of which need to be further investigated.

GO52

Gender Differentiation in Jewish Memorials: An Ethnoarchaeological Examination of the Headstones in the B'nai Israel Cemetery, *Simon Goldstone, East Carolina University, Greenville, NC*

An ethnoarchaeological approach to the study of historic cemeteries and associated gravemarkers offers a tested and non-invasive methodology which can garner insight into the collective and personal identity of individuals within and between specific cultural groups. For the investigation of the Jewish diaspora, such ethnoarchaeological studies have proven to be one of the richest sources of data on religious and cultural practices related to death and burial. Past studies have examined diversity in Orthodox, Conservative, and Reform Jewish cemeteries throughout North America and the Caribbean. This paper will examine the morphological and stylistic changes in headstone form and inscription diachronically with specific focus on patterns of gender differentiation at the B'nai Israel Cemetery in Gainesville, Florida. As one of the oldest, Jewish-specific cemeteries in North Florida, B'nai Israel offers opportunities to analyze long terms changes in headstone construction and spatial arrangement.

GO53

Relationships Among Cohesion and Performance, Anxiety, Retention, and Satisfaction, *Arden Anderson and Stacy Warner, East Carolina University, Greenville, NC*

Recently, Social Networking Analysis (SNA) has emerged as a promising research approach to measuring cohesion (Warner, Bowers, & Dixon, 2012), in addition to the Group Environment Questionnaire (GEQ) (Carron, Widmeyer, & Brawley, 1985). However, little to no research has simultaneously used both measures to compare and contrast their unique benefits. High levels of team cohesion enable athletes and the team to reach peak performance, while simultaneously fostering greater athlete satisfaction and well-being (Carron, 1982). Thus, the present study sought to examine the impact of using SNA (friendship and efficacy) and the GEQ and assess its relationship with team performance, anxiety, retention, and satisfaction. Players and coaches from four NCAA Division-I Women's Volleyball teams ($n = 49$) completed an online survey at presaison, midseason, and postseason. Pairwise comparisons revealed that cohesion within the friendship network increased [$F(2,90) = 7.967, p = .001, 2 = .150$], while ATG-T [$F(2,90) = 23.034, p < .001, 2 = .339$], GI-T [$F(2,90) = 18.657, p < .001, 2 = .293$], and GI-S [$F(2,90) = 4.685, p = .012, 2 = .094$] decreased over the course of the season. Pearson correlations revealed a strong, negative relationship between preseason ATG-T and mid- ($r = -.974, p = .026$) and post-season ($r = -.969, p = .031$) performance. Therefore, ATG-T is significantly related to poorer performance later in the season. In addition, preseason efficacy had a moderate negative relationship with mid- ($r = -.478, p = .001$) and post-season ($r = -.380, p = .007$) somatic anxiety. Therefore, preseason efficacy could predict lower levels of somatic anxiety. Postseason retention had moderate relationships with mid- and post-season ATG-T ($r = .377, p = .008; r = .525, p < .001$), mid- and post-season ATG-S ($r = .344, p = .016; r = .454, p = .001$). In addition, postseason efficacy was moderately related to retention at pre- ($r = .408, p = .004$); mid- ($r = .345, p = .015$); and post-season ($r = .409, p = .004$). Therefore, retention is related to both task and social attractions to the group and efficacy. All GEQ cohesion subscales, except mid- and post-season GI-S, were positively correlated with athlete satisfaction across all three time points. The results of this study highlight the positive outcomes of team cohesion, while also further positioning SNA and the GEQ as important tools for athletic administrators and coaches to better understand the cohesion of their teams.

GO54

Evaluation of Anti-fat Biases in Kinesiology Students and the Impact of Participating in Project Mentor on Implicit and Explicit Attitudes, Taylor Christen Calame & Thomas D Raedeke, Department of Kinesiology, East Carolina University, Greenville, NC

There have been limited efforts that have sought to reduce explicit and implicit anti-fat prejudices. Explicit attitudes are views that people willfully acknowledge, but are subject to social desirability. Implicit attitudes are unconscious attitudes that are deeply engrained in one's mind and more strongly linked to behavior. Given that past research has found that Kinesiology students have strong anti-fat biases, the purpose of Study 1 was to evaluate whether Kinesiology students have stronger biases than students in other majors where weight and body-related issues are central (e.g., Nutrition) and less central (e.g., Psychology). For this study, One-hundred fifty three students majoring in Kinesiology, Nutrition, and Psychology completed the Implicit Association Test (IAT) to assess implicit attitudes and the Anti-Fat Attitudes test (AFA), Beliefs About Obese Persons (BAOP), and Attitudes Towards Obese Persons Scale (ATOPS) to measure explicit attitudes. Initially, t-dependent sample t-test revealed that anti-fat biases existed within all majors. The highest values of biases were expressed when fat was paired with lazy and bad. A series of one-way ANOVA's were used to evaluate potential attitudinal differences across majors. These results revealed no significant differences in implicit attitudes, however, significant findings were found among majors regarding the ATOPS score and AFA: Dislike subscale. Kinesiology and Nutrition students displayed the highest explicit attitudes on these two measures. These results support that anti-fat attitudes are prevalent across majors assessed and not only in Kinesiology students. Study 2 was designed to evaluate the impact of working with overweight adolescents as part of Project Mentor on anti-fat biases using both implicit and explicit attitude measures. In Study 2, fifty-five Exercise Science students, working with Project Mentor, completed pre- and post-test measures evaluating implicit and explicit measures. Results were compared with a control condition of other upper level Kinesiology students involved in other research experiences. A series of 2 (time) X 2 (condition) repeated measures ANOVA's will be used to evaluate whether working with overweight adolescents impacted anti-fat attitudes.

GO55

North Carolina health director and county commissioners' perception of 'winnability' of local food- related obesity prevention policy change strategies, Leigh Cunius, Dr. Stephanie Jilcott Pitts, Department of Public Health, Brody School of Medicine, East Carolina University, Greenville, NC

Residents of North Carolina are faced with low access to healthy food options and a high prevalence of obesity, and could thus benefit from community-level obesity prevention efforts. The present study examines the feasibility and acceptability, or 'winnability', of the local food-related policy and environmental changes recommended by the Center for Disease Control and Prevention's (CDC) Common Community Measures for Obesity Prevention (COCOMO), as perceived by local health department

(LHD) directors and county commissioners (Pitts, Smith, et al., 2013). The purpose of this study is to examine two influential stakeholders' opinions of local food-related policies in North Carolina's 100 counties to inform the next steps for obesity prevention in a municipality. COCOMO measures five and six, both related to local food, were assessed (Khan, Sobush, et al., 2009). LHD directors and county commissioners were surveyed to determine the perceived winnability of the 24 COCOMO strategies. The winnability score was based upon the infrastructure, leadership, cultural, and funding support judged by the two stakeholder groups. We examined the agreement of winnability between stakeholders for the specific local food-related community level obesity prevention policy change strategies. Levels of disagreement were examined beside winnability scores using a linear regression model. The association between each county's total winnability z score of the two strategies and the number of existing farmers markets and fruit and vegetable outlets per county, which measures local food access, was examined using linear regression. Findings will be used to inform the next steps in increasing local healthy food access to reduce obesity.

GO56

The Role of Religious Values: Young Christians' Opinions towards Tattoos, Rachel Anne Johnson, Honors College Graduate, Chemistry Graduate Student, East Carolina University, Christine B. Avenarius, Associate Professor of Anthropology, East Carolina University, Greenville, NC

Recent studies explained the increasing popularity of tattooing in American society as humans' desire to express individuality and gain acceptance into a subculture (Blanchard, 1991; Gagne & Orend, 2009). Previous literature compared the decisions of youth to get a tattoo to other life influences (Roberts & Ryan, 2002; Farrow et. al., 1991). But few studies have explored the motivations for body adornment among young Americans that simultaneously choose to participate in Christianity (Scheinfeld, 2007). However, research has demonstrated that spirituality can influence tattooing practices (Caplan, 2000; Swartz, 2006). For researchers interested in cultural change this presents the question: What is the role of Christianity as a spiritual influence on current tattooing practices among young Americans? I began exploring this question in 2013 inspired by the realization that specific bible scriptures have been cited to validate the discouragement of body adornments, particularly tattoos, in Christianity. Contrary to this, preliminary research further showed me that many young people affiliated with a particular Christian faith community in Greenville, NC have a positive attitude towards religiously symbolic tattoos. Therefore, I used ethnographic research methods to gain insight into the emic perspective of 18 to 30 year old active-Christians about the relationship between tattooing and faith interpretations. In 2014 I collected data using a semi-structured interview instrument which included two free-listing tasks and additionally asked open-ended questions about personal faith, Bible verse interpretations, tattoo stereotypes, tattoo symbolism, and tattoo opinions. To increase comparability, all informants were recruited from the same non-denominational Christian organization in Greenville, NC. A quota sample was employed to reflect differences by gender and preference for tattoos (Bernard,

2011). Interviews were recorded and transcribed thanks to generous funding from an Undergraduate Research and Creative Activity Award. The resulting text was coded using a grounded theory approach, logging discoveries about frequencies and co-occurrences of themes to establish similarities and differences between the opinions of study participants. This paper will present a model of how religious beliefs are predictive of tattoo preferences in a small community of young active-Christians and discuss directions for further research.

GO57

Visual Representations in AAC Technologies and Teaching Art to Learners with Complex and Profound Disabilities,
Nicole Elizabeth Allen, East Carolina University, Greenville, NC

Augmentative and Alternative Communication (AAC) technologies are encoded with abstracted images, symbols, and signs that are believed to be most salient and culturally valued. Arnheim (2004) states that abstraction causes a paradox, as the elements of the represented object should display its most salient features, but the abstraction can make the symbol difficult to recognize as the abstraction may distort these salient features (p. 141). If the symbols developed for AAC technologies intend to depict the most salient features of something, do they truly function as such for the viewers/users that use these images and are they able to make the same meaning? Gillespie-Smith and Fletcher-Watson (2014) identify that research is needed to understand how users of AAC technology understand concepts related to symbols; however, there is a distinct lack of research of the effects of varying stylistic representations, realism, and familiarity of symbols in comprehension and utilization. To explore some of the identified issues, I am conducting research investigating the relationship of familiarity to representations, the impact of varying style and abstraction of symbols, and how familiarity and style affect recognition and utilization of pictorial symbols for a learner with a profound disability.

I will apply this research in a practical setting to develop methods art educators can use to design art experiences that foster independence, functional skills, and cognitive development for learners with profound disabilities. Art educators are provided minimal resources through pre-service education and professional development to approach teaching art to learners with profound disabilities, because there is little research providing insight in how to design meaningful arts experiences for these learners. Through the past two years of informal observations with my research participant, I have found interventions and designs that have developed her ability to participate independently in some arts activities and developed functional skills, some of which have been generalized into other environments. Through formal research, I hope to more clearly define how to design arts experiences for learners with complex and/or profound disabilities and provide these learners greater opportunity to participate independently, have greater voice and choice, and develop critical skills.

GO58

The Impact of Parent PLUS Loan Policy Revisions on Historically Black Colleges and Universities, *Elizabeth Cogbill¹*

Kimberly McGhee², Tamika Wordlow³, Dorothea Mack⁴, Laura Bethea⁵

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The purpose of our study was to examine the impact of regulation changes to Parent PLUS Loans and its effect on student enrollment numbers at Historically Black Colleges and Universities (HBCUs). Contemporary HBCU educational leadership have indicated the federal policy revisions occurring after 2010 have significantly affected student enrollment numbers at their institutions. This study was designed to increase our understanding of federal financial aid regulation changes and their impact on the ability for students to attend and persist at HBCUs. Parent PLUS Loans have served as an important way to bridge the gap between the costs of higher education and the amount of financing available to students. The purpose of our study was to investigate the relationship between the changes in the Parent PLUS Loan policy and the student enrollments at both public and private HBCUs.

Our research question was to examine if regulatory changes to the Parent PLUS Loans impacted student Fall enrollments at fifty eight institutions both private and public HBCU's. To evaluate, we analyzed data collected through the Integrated Post-secondary Education Data System (IPEDS) via the Web Casper system and Parent PLUS loan data from the Office of Federal Student Aid.

After review of the literature and data analysis of the Fall enrollments at HBCUs in the southeast region, the years of 2009-2012 were examined for any changes in Fall enrollment patterns. Based on the consideration of institutions, student Fall enrollment, and the number of Parent PLUS Loans disbursed, the analysis results support a statistically significant difference in the Fall enrollment at public and private HBCUs each year after the Parent PLUS Loan revisions were implemented in 2011.

Our data analysis revealed that the observations of HBCU collegiate leadership were not unfounded, and that there is a significant relationship between Fall student enrollments from 2010, 2011, and 2012 and the amount of Parent PLUS Loan disbursements.

Our study provides lessons for higher education public policy and the affect of regulations on student enrollments on college campuses. In light of newer more "parent friendly" regulations implemented fall 2015, we recommended that further research is conducted to highlight how the noted regulatory changes impact the 2015-2016 academic year and the years thereafter for the identified HBCUs in the southeast region.

GO59

The Effect of Teacher Mediated Vocabulary Discussions

During Read Alouds, Leanne R Radabaugh, East Carolina University, Greenville, NC

This action research study utilizes a quasi-experimental pre-/post-test design to examine the effect of teacher-mediated vocabulary discussions during read alouds. Participants are 40 second grade students. During this six-week instructional intervention, fourteen students participated in discussions of targeted vocabulary both in the context of the read aloud text and in the context of their own lives. They also participated in discussions of examples of the targeted vocabulary, of non-examples of the targeted vocabulary, and of synonyms for the targeted vocabulary. Sixteen comparison group students were incidentally exposed to the words during the read aloud. Data sources include a multiple choice assessment, an open ended assessment that requires students to give examples and non-examples of the targeted vocabulary, and a researcher log. Quantitative (independent samples t-test) and qualitative data analysis is currently in progress. Results and implications will be shared.

GO60

Music and Movement: Dance and the Liberation of the French

Aria, Hannah Elizabeth Riddle, East Carolina University, Greenville, NC

In 18th-century France, opera had been a thoroughly established art form since the founding of the Royal Academy of Music in Paris in the 1600s and held a prominent place as entertainment in elite social circles. However, a new field of performance was quickly emerging as a vital component to the Enlightenment movement of the mid-1700s. Up to this point, dance in opera, eventually known as ballet d'action, held a naturally subservient position to the music itself, and was used as an embellishment rather than a focal point. Nonetheless, with the influence of important artistic advocates of the Enlightenment such as Jean-Georges Noverre, dance began to progressively grow more integral to opera performances. After some resistance, ballet began to be recognized independently in France as an expressive form almost equal to that of the highly esteemed opera.

Simultaneously, French opera itself was experiencing a sense of reform. After the death of Jean Baptiste Lully in 1687, the operas began to exhibit a broader acceptance and promotion of the Italian style particularly in the development of the aria. Previously, the airs written by composers such as Lully were viewed as decorative while the core musical attention rested upon the traditional style of recitative. It is surely no coincidence that both dance and the operatic aria began their rise to prominence in France during the same time period. Furthermore, the acceptance of the Italian style arias reflects the same adaptations which were being made in ballet towards the Italian traditions. Because these two have always been particularly intertwined in French artistic culture, the changes in the field of dance had a direct affect on the development of the French aria. This paper presents the correlation between the development of the operatic aria and the French ballet as a distinct genre in the performing arts of 17th century Europe.

GO61

Minuten Fun Betochen: The Correlation Between the Music of Mordecai Gebirtig and Life for Jews in Poland from c.

1900-1942, Kate Frances Oliphant, East Carolina University, Greenville, NC

The experience of Polish Jews in the early 20th century is represented in many different primary sources. One source in particular that has often been overlooked by historians is the music of certain folk artists. Whenever historians and musicologists do address this music, they tend to focus on analyzing the music itself instead of comparing it to non-musical historical sources in order to see how representative and accurate of a reflection the music provides. While this is not inherently wrong, it does limit the usefulness that these sources can provide. An excellent example is the music of Mordecai Gebirtig, who is considered the troubadour of the Jewish people. It offers a unique look at the life and times of Jews in Poland from 1900 to his death in 1942. Through his music, historians gain a valuable firsthand perspective on questions dealing both macro and micro aspects of Jewish life, including poverty, orphans, communism, family dynamics, marriage, education, tension with Gentiles, ghetto life, and an overarching optimistic resilience that is characteristic of Jews.

GO62

THE COMPOSITIONAL STYLE OF TWO EARLY BAROQUE COMPOSERS: INNOVATION AND

EMERGING TONALITY IN POLYPHONIC VOCAL MUSIC AT THE TURN OF THE 17TH CENTURY, Kimberly Ness, East Carolina University, Greenville, NC

The turn of the seventeenth century was a time of cultural, religious, political, and intellectual upheaval in Europe. As day-to-day life shifted, so did the aesthetic of music – both a new-found faith in rationalism and a desire for wonder and mystification led to various innovations in compositional style, manifesting in an increased use of chromaticism, novel dissonance-resolution patterns, and an emerging sense of tonality as we know it today. Johann Herman Schein was one of the most exemplary composers in terms of these compositional innovations at the turn of the seventeenth century. Examining the music of both Schein and of Schein's contemporaries provides insight as to how these innovative compositional tendencies influenced choral music for centuries to come. Claudio Monteverdi, an Italian composer active between 1582 and his death in 1643, is often considered the archetypal bridge between the Renaissance and Baroque eras. Perhaps because of being a product of cultural turmoil or perhaps because of his musical genius (or even perhaps a little of both), he captured that which was going on around him in his music in the form of what is now seen as Baroque poetics – namely meraviglia, or essentially astonishment and dramatics.

Eric Chafe's study and analysis of Monteverdi's madrigal "Cruda Amarilli" from the Fifth Book of Madrigals of 1605 is central to this

research, and provides a case study of innovations in polyphonic vocal music at the turn of the seventeenth century. Close examination will show an intimate text-music relationship, a departure from harmony as an adequate tool for portraying the meaning of the words, a new approach to musical form, and a striking treatment of dissonance. Many of these same innovations can be seen in a representative piece of Schein's, entitled "Die mit Tränen säen," from his collection of pieces composed in the manner of the Italian madrigal, *Israelsbrünlein*. Many scholars see this collection, published in 1623, appearing as an apex of Schein's expressivity and acts as a model example of the composer's preferred compositional practices. While a cursory look shows creativity in formal practice, deeper analysis only further conveys Schein's innovative spirit and brings to light the idea that Schein's polyphonic vocal music marks a significant point in music history: the emergence of tonality.

GO63

Investigations into the Oldest Standing Structure in North Carolina, Coy Jacob Idol, East Carolina University, Greenville, NC

Dendrochronology has returned a felling date of 1718/1719 for parts of the Lane House, located in Edenton, North Carolina. This makes the house the oldest standing structure in North Carolina. The Lane House, however, does not sit in its original location. Through the use of archaeological techniques a terminus post quem, 1849, was established for when the house arrived at its current location. Using historical documents this date was further refined to the 1890's, and the genesis of an African-American neighborhood. This allows for not only new insight into the changing landscape of Edenton, as it underwent industrialization and North Carolina grappled with Fusionist politics. It also provides insights into the daily lives of African-Americans as they struggled to find their place in the "New South."

(2009) define body-monitoring technologies as "medical technologies that grant increased control and surveillance over human bodies." As mechanisms for tracking, these fitness bands are at home methods of controlling and surveying our bodies. Scholars discuss body-monitoring technologies in terms of monitoring patient progress as well as helping to motivate patients toward proper healthcare. Chandra et al. (2012) highlight the ways in which physiotherapists can use body-monitoring technologies to motivate patients to complete their home exercises.

They contend that due to the popularity of wearable tech that motivates individuals to be "more fit" through motivation and entertainment, these technologies can be "effective tools for therapy programs" (pg. 237I). Likewise, Shaw (2006) contends that body-monitoring technologies can be used in drug rehabilitation. He posits that it "could be used to detect when someone is experiencing anxiety or stress...that could lead to relapse" (pg. 30). Both the Chandra et. al. and the Shaw articles represent the positive views of body-monitoring technologies and personal health, while Frost and Haas frame some body-monitoring technologies as invasive to an individual's body as well as personal privacy.

Chandra, H., Oakley, I., & Silva, H. (2012). User Needs in the Performance of Prescribed Home Exercise Therapy. CHI'12 (pp. 2369-2374).

Frost, E. & Haas, A. (2009) Seeing and Knowing the Womb: Rethinking Fetal Ultrasound toward a Decolonization of Our Bodies. Journal of Advanced Composition. forthcoming

Shaw, B. R. (2006). Can new technologies prevent relapse? Behavioral Healthcare, 26(6), pg. 30-3I

GO64

The Rise of the Fitbit: Body-Monitoring as Habit, Addiction, and Motivation, Christina Rowell, East Carolina University, Greenville, NC

This presentation will examine the ways that body-monitoring technologies like the Fitbit take the acts of surveillance and regulation and translate them into habit, addiction, and motivation by evaluating articles from popular sources to answer the research question: "How do body-monitoring technologies like Fitbit push the Public to think about fitness, habits, motivation, and addiction?"

This research stems from the increased use of body-monitoring technologies since the release of fitness bands such as the Fitbit Flex. Fitbit and other manufacturers advertise fitness bands as tools that individuals can use to encourage a more active lifestyle through means of tracking individual progress. This wearable tech is used to track steps taken, calories burned, quality of sleep, etc. Scholars such as Frost and Hass

GO65

Cemetery Rhetoric: A Visual and Textual Lens for Understanding the Past, *Suzan Flanagan, Department of English, East Carolina University; Rexford Logan Rose, Department of English, East Carolina University; Edward Reges, Department of English, East Carolina University, Greenville, NC*

Of Aristotle's three types of rhetoric, epideictic rhetoric is the most concerned with praising moral virtue. This type of rhetoric is common in eulogies and any rhetoric surrounding death or dying. Segal (2005) writes, "Epideictic rhetoric is a culture's most telling rhetoric, because, in general, we praise people for embodying what we value, and we blame them for embodying what we deplore" (p. 61). One way to gain an understanding of past cultures and societies is to examine examples of epideictic rhetoric, such as tombstones and obituaries.

For this presentation, we will explore how cemetery writing and funerary symbols not only represent something valued about the deceased but also represent cultural and societal beliefs. In addition, we will discuss how prominent ECU founders and leaders, who were interred in Cherry Hill Cemetery, were memorialized through tombstone inscriptions and symbols, obituaries, and other available epideictic rhetoric. To understand how tombstone inscriptions and symbols reflected cultural and societal beliefs, the researchers analyzed a sample of 200 tombstones from the approximately 1,400 tombstones found within Cherry Hill Cemetery. The sample includes death dates ranging from 1853 to 2014.

The researchers performed a thematic content analysis of the sample, using a mix of both inductive coding, which allowed themes to emerge from the data, and deductive coding, which was grounded in cemetery-related themes culled from the literature (Buckman, 2003; Chiaburu, 2012; Rahtz, 1988; Ritter, 2012; Wilson, 2000). Themes play a vital role in making meaning in what could otherwise seem like arbitrary text. According to Braun and Clarke (2006), a theme allows the researcher to connect this text or piece of text back to the research question, and it allows for themes to be looked at as patterns (p. 82).

By thematically analyzing texts and symbols that were used to commemorate and honor the lives of ECU founders, we hope session attendees will leave with a better understanding and appreciation of the cultural and personal values that shaped these leaders.

GO66

Finite Element Modeling of the Velopharyngeal System, *Anish Sana, East Carolina University, Greenville, NC*

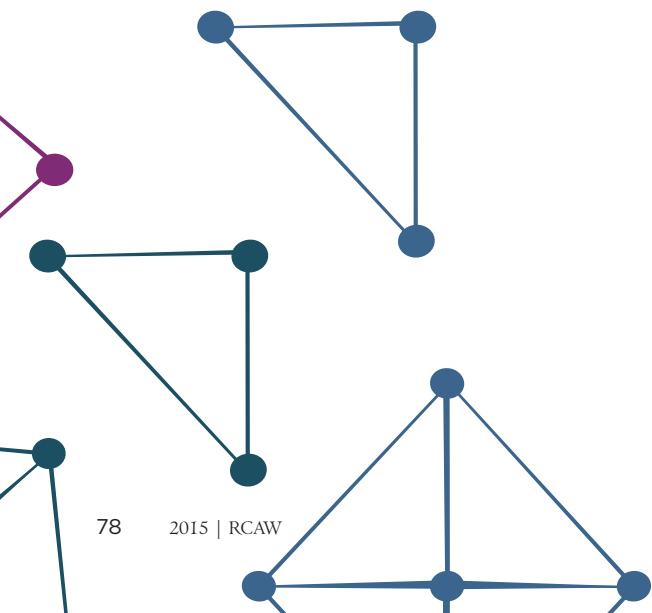
Cleft Palate is the fourth most common birth defect in the United States. Corrective surgery can be performed to treat patients suffering with a cleft palate but there are several challenges that need to be overcome. Children with cleft palate are deemed to be less attractive and sociable by their peers, due to which they are alienated. Even after corrective surgery, patients tend to have hyper-nasal speech. Teaching proper articulation techniques with the help of a speech therapist can help reduce the perception of nasality. However, there is a lot of variation in articulation among speakers which makes the task challenging. It has been shown that electromagnetic articulography can be used to account for inter-speaker variability and help speech therapists teach patients with a repaired cleft palate to articulate properly. The proposal here is to use velopharyngeal data obtained from magnetic resonance imaging to create a finite element model. This model can effectively calculate various forces acting on each of the muscles during articulation. The study will conduct experiments on subjects with normal anatomy and those with a repaired cleft palate. The data gained from subjects with normal anatomy can be compared with the data obtained for those with a repaired cleft palate. The differences can be used by speech therapists to teach proper articulation to subjects with a repaired cleft palate in order to reduce the perception of nasality.

GO67

Predicting Website Usability, *Venkatnarsimhareddy Chintalapani, East Carolina University, Greenville, NC*

Usability is defined as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (ISO 9241-II). Website usability evaluation assesses how easy it is for users to reach a web page with content relevant to a task they are trying to perform. A task could be purchasing a product from an e-commerce website or simply searching for information on a web page. Good website usability allows users to perform a task easily and effectively.

Website usability evaluations are typically performed by usability experts who hand out application specific tasks to users and then perform evaluations based on the users' interactions with the system. Such tests provide great insight into usability issues. There exist very few automated usability testing frameworks which analyze a web page's usability. Such automated methods allow developers to analyze the web page's design very early in the development phase thereby reducing usability evaluation costs later on. The hypothesis that we would like to present is the possibility of creating a model which predicts the usability of a web page based on a few usability metrics and verify them against data obtained from user-based task evaluation.



GO68

Indoor Path Finding via drones, Hooman Hedayati, East Carolina University, Greenville, NC

In every hazardous conditions, we would like to take actions which are safe, quick and efficient. Imagine a house on fire, every single seconds is as valuable as a human life. In this condition if we know the indoor map of house or where are the victims, we can rescue them more quickly moreover not put rescue team in danger. Rescue team, typically start from a point (typically entrance of that place) and explore it room by room to search for probable victims. Breadth First Search and Deep First Search are two approaches for exploring a graph, which is time consuming. In our approach we built a quadcopter from scratch and improve previous solutions. Instead of one quadcopter, an intelligent algorithm would decide, number of Quadcopters which needed to explore whole house. GPS is not working indoor, and even if it works, accuracy is not reliable. In our approach, a camera used to capture images and an image processing algorithm implemented to find "Most Reliable Straight Line (MRSL)", as a reference line, in every image. With comparing two consecutive images and MRSL, latitude and position of quadcopter could be calculated. A depth scan camera is used to identify windows doors and hallways. Rectangle and square items are more likely to be door and square items are look to be windows. With combination of data from to sources (regular camera and depth camera) the house plan would plotted.

GO69

Quality of IPv6 Enablement of Universities: An International Study, Annie Yong Patrick, East Carolina University, Greenville, NC

This research presents the findings of the first large scale, quantitative study of the quality of IPv6 enablement of university websites. IPv6 is the next generation of Internet Protocols, replacing the archaic protocol known as IPv4. Internet protocols such as IPv4 and IPv6 are responsible for connecting devices such as are smartphones, tablets, and laptops and transmitting this data over the Internet. There is a global urge for enterprises, government organizations and institutions of higher learning across the globe to become IPv6 enabled. A university's readiness or delay in transitioning their internet infrastructure to IPv6 can have consequences affecting research, innovation, and funding. Therefore, this study utilized a cloud based user experience MaaS (Monitoring as a Service) tool to determine the IPv6 reachability and the IPv6 "effectiveness" of more than 1000 international web sites.

The National Institute of Standards and Technology's (NIST) website provides the status of IPv6 enablement of universities in the United States, however, there is no known source of such data of universities on an international scale. Also, to date, there is no published quantitative study of the quality of university IPv6 enablement as measured by the user experience.

In this study, the MaaS tool was used to collect DNS, website connectivity, and website performance data of more than 1000 universities

located in 59 countries. The MaaS tool employed seven application performance monitoring "agents" distributed globally in locations in North America, Europe, and Asia to poll each university website at specified intervals of 15 minutes for a period of 5 days. The seven "agents" were located in Atlanta, New York City, Seattle, Hong Kong, Singapore, the Netherlands, and Slovenia.

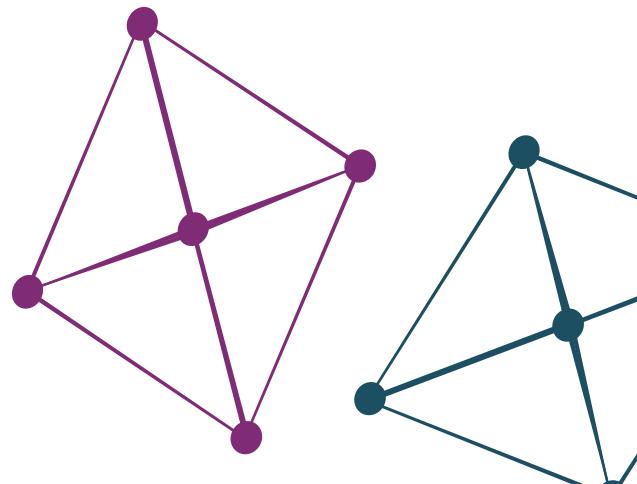
The MaaS data collected in this study provided information of the external facing services for each university website enabled for IPv6. In addition, this study provides insightful analysis of the IPv6 effectiveness of the connection to these websites. The implications of the findings are that citizens worldwide who use IPv6 to access the resources offered by universities may experience performance degradation, variability in performance, and sometime no IPv6 connectivity at all. This paper also points to the impact that token, yet unmonitored IPv6 implementation, has on services and the brand of the university.

GO70

A Photographic Investigation of "The Great Train Robbery" of 1903, Addison Jarvis Brown, East Carolina University, Greenville, NC

In 1903, "The Great Train Robbery" was released to the public as the first narrative motion picture film. This film is largely responsible for the commercial success of its medium. The technological advancement placed the plot in front of a backdrop of the real world as opposed to the precedent stage plays. My current study is examining the film and its attributes that became the cultural inventory of the technology.

The enhanced physicality of stage acting, that was once utilized to convey immediate emotion regardless of the viewer's seat in the theater, transitioned into the motion picture. In scenes of death and violence, this gestural quality of acting develops a rhythmic dance that greatly contrasts the realism of the medium. I appear in my photographs as reenacting this film's scenes of intensive dramatization as identifying myself as a participant in this form of entertainment.



GO71

The Art and Traditions of Mourning and Sentimental Jewelry, *Barbara Nicholson McFadyen, East Carolina University, Greenville, NC*

My current work is concerned with life and death, loss and remembering. My research focuses on the art and traditions of Mourning and Sentimental Jewelry. It investigates these traditions from historical origins and evolution, to specific funeral and mourning customs and practices, with particular emphasis on the many various forms of this jewelry found in rings, brooches, necklaces, and portrait miniatures.

Early forms of this genre date back to the 15th and 16th centuries and continue through the 19th century, with the Georgian and Victorian eras being the strongest periods of expression in this art. The use of certain symbols, stones and motifs offers a glimpse into the meaning of each individual jewel and tells a story about those who lived, loved and died before us.

As a metalsmith and enamelist, I am extremely interested in the painted enamel portraits and “look of love” eye miniatures. I will also explore the many unusual materials that were used in these finely crafted works, such as steel, Jet, French Jet, and human hair. A viable and unique industry grew out of this practice of creating wearable mementos of loved ones lost. I am particularly interested in examining what customs our predecessors believed, wore, and created while coping with the struggles and resulting issues of death and grief.

GO73

Creative process: ssecorp evitaerC, *Brett Beasley, East Carolina University, Greenville, NC*

The creative process. It's messy, repetitive and sometimes draws inspiration from itself. What really happens in the creative process and how can a person harness the potentials of creativity? This question has helped me devise a set of guidelines to follow that help keep me on task to produce a final product. To implement this strategy, I design geometric three dimensional shapes to be my raw material, or building blocks, for my ceramic sculptures. Setting up construction parameters utilizing spherical shapes, cylindrical shapes and slabs of clay, I can reduce my pallet to formal elements. Additionally, when I create these sculptural forms I implement time and size requirements. For example, I set a timer allowing one hour for preparation of materials and two hours for building.

The rhythm of creation and completion in my art-making cycle allows for objectives to be accomplished. One objective helps facilitate creativity within these guidelines. Utilizing time restraints helps me to conform to real world expectations of deadlines and time management. Ultimately, efficient and constructive use of time creates a serene and transcendent experience that completes me. The final sculpture reflects the guidelines that I have conceived while also observing the limitations and potentials of the creative process.

GO72

Democratized Technologies in Studio Practice, *Devin George Mekim, East Carolina University, Greenville, NC*

The ease of access to new technologies allows for the empowerment of those outside of the technical industry to access and use technological products. Devices such as 3D printers, Laser Cutters, and advanced CNC routers provide the means for the precise fabrication of digitally designed object prototypes, in this case in the production of slip cast ceramic mold-making. Specific focus will be in application of newly available technology in the creation of interchangeable molds for the manufacture of slip-cast custom growlers, as well as how technological innovation can influence and shape the production of handmade goods.

GO74

Humans are social [media] creatures, *Andrew Ross Wells, East Carolina University, Greenville, NC*

My recent body of artwork, which includes a number of drawings, paintings, and short films, serves as a critique of how modern America's dependence on technological advances changes the way we communicate and behave in an online dominated culture. According to multiple estimates, over 91% of adults worldwide own a cell phone. Facebook and Twitter both had over 1.2 billion users at the end of 2014. Modern technology has made it incredibly easy for communities to unite over long distances quickly. I can chat with a friend overseas in seconds, and worldwide news can be found just at the end of our fingertips.

However, what do we do with this newly found power and technology? We “troll” other people in online forums, send crude photos to friends for them to be leaked to the rest of the world later, and text while driving because saying, “what's up dude” couldn't wait. I present these faults of Western Culture in a satirical/humorous way, so the viewer can observe their culturally driven behaviors in a new light.

GO75

Multi-Layered Conversations, *Sarah Kathryn Hooper,
East Carolina University, Greenville, NC*

The consistent theme surrounding my work throughout the years is the use of my body to create my own personal record. The photographs I make of myself are not representational of a specific truth but a creation of a moment or feeling I want to express. I work intuitively and often develop communication between myself and the image as I transform the original into a multi-layered conversation. By manipulating the images of myself through multiple photographic processes and mixed media, I am able to build my own narrative, which describes the uncertainty of my path. My current investigations aim to understand and build connections between the images I've constructed during the last several years.

to carry out. The communal component to the firing allows it to be an exciting process that engages the participants from start to finish. My research will further my understanding of this method as well as be able to share it with others.

In order to be able to use this method of firing students at East Carolina University need a specific kiln area, which is currently unavailable. I am collaborating with the North Carolina Pottery Center in Seagrove, North Carolina to build a kiln that ECU students can use on a regular basis. Researching raku processes, working with NCPC to create a venue, building a raku kiln and teaching the method to other students will assist in furthering my creative activity on all levels from research to finished ceramic product.

GO76

Rejuvinating Effects of Nature-Inspired Art, *Emily Joy Branch,
East Carolina University, Greenville, NC*

My research revolves around the potential of visual art in hospitals—specifically artworks that reference the outdoors. Many studies have demonstrated positive correlations between nature imagery, and faster recoveries, better workplace environments, and lower anxiety levels of patients and employees in healthcare facilities. I am creating artwork for healthcare environments based on personal experiences of rejuvenation and based on my research of this topic. My artworks for this study are in the form of three-dimensional installations and large-scale paintings in an attempt to more acutely influence interior environments, and create a refreshing atmosphere for the viewers.

GO77

Ceramic Raku Firing Method and a Collaborative Kiln Building Project, *Erin Elizabeth Younge, East Carolina University, Greenville, NC*

Raku ceramic glazing is a method that creates a unique surface quality to low-fired clay pieces. The raku process is distinct because while the ceramic works are still hot they are pulled from the flames, and placed into a bed of dry organic combustible materials. Once in the bed of combustibles, such as pine needles, sawdust, flowers or paper, they are covered to smolder under a metal enclosure. The smoking and abrupt transition during the firing causes a reaction that creates lustrous coloring and cracking to form on the surface of the glaze and clay body.

This glazing method is action oriented and requires a team of people

GP1

Specific Responses to Denervation Atrophy Differ By Mouse Strain, Javid Hakimi, Cameron A. Schmidt, Joseph M. McClung, and Jeffrey J. Brault, East Carolina University, Greenville, NC

Skeletal muscle atrophy caused by denervation is a serious consequence of neuropathic disease, especially diabetes. However, the only proven treatment for muscle atrophy is exercise, which can be difficult or impossible for patients with a neuropathic disease. Fortunately, as a clue to novel treatment targets, there is evidence for a genetic component that predisposes mice to have a resistance to skeletal muscle atrophy during ischemia. The aim of this study is to identify whether this strain-dependent resistance is evident in a purely denervation model of skeletal muscle atrophy. Twenty male C57BL/6 mice and twenty male BALB/C mice had their sciatic nerve sectioned in their left leg and were sham-operated in their right leg. Blood perfusion of the lower hindlimbs was measured over the next 14 days with Laser Doppler Perfusion Imager (Periscan PIM II). At 14 days post-surgery, tibialis anterior, soleus, extensor digitorum longus (EDL), gastrocnemius, and plantaris muscles were harvested, weighed, and total protein content measured using a BCA protein assay (Pierce). The denervated hindlimbs of the C57BL/6 mice had significantly greater perfusion than the BALB/C at day 1 (+30%), day 3 (+27%), and day 13 (+40%), while day 5 was not different. There were no differences between mouse strains in weights of the innervated muscles ($p < 0.05$). In response to denervation, muscles atrophied in all hindlimb muscles ranging from approximately 29% (in the EDL) to approximately 46% (in the gastrocnemius) depending on muscle. Consistent with loss of mass, tibialis anterior muscles also lost protein content after denervation, which did not significantly differ between strains. In summary, despite our previous reports of a strain-dependent difference in ischemia-related atrophy and despite the differences in tissue perfusion during denervation, muscle of the BALB/c and C57BL/6 mice atrophy to the same extend during denervation atrophy.

Funding: Interdisciplinary Research Collaboration Award, ECU

GP2

Comparison of Local Public Health Agency Structure in North Carolina and Health Outcomes, Matilene Victoria Osho, East Carolina University, Greenville, NC

Background: Administration of the local health departments (LHDs) in North Carolina used to be decentralized. In 2011 North Carolina legislators passed a law that would change the structure of local public health agencies. This new legislation allows all counties the option to create consolidated human service agency (CHSA) regardless of county size. This law became effective June 29, 2012 and changed the administrative structure of local public health department. The economic downturn has reduced funding for local health departments to provide

public health services.2 Study objective: Between June 2012 and May 2013, seven county health departments became CHSAs.2 In North Carolina there is a total of 85 local public health agencies (LPHAs), in which there are 6 district health departments (DHDs); 68 county health departments(CHDs); 1 public health authorities; 1 public hospital authorities; and 9 CHSAs, serving 100 counties.2 The aim of this study is to examine the structures of local public health departments and to compare the health outcomes of the different structures. This study will also examine changes in health outcomes over a three year period, before and after the enactment of the law.

Methods: A spreadsheet is created with all 100 counties. Demographic characteristics of each county are identified through population estimates and income. The variables considered for this study will be infant mortality rate, teen pregnancy rate, tuberculosis rate, HIV, Chlamydia rate, Gonorrhea rate, and Syphilis rate. The data for this study was obtained through the North Carolina State Center for Health Statistics and U.S. Census. A t-test will be used to compare health outcomes throughout the three year period. Results: I would expect from the analysis that for the seven county health departments that became CHSA there would be an improvement in the health outcomes observed after 2011. I would expect to examine a greater improvement in health outcome for smaller population sizes in comparison to larger populations. Conclusion: When conducting this study again, researchers would need to determine the each counties ability to reduce tobacco use.

1. House Bill 438. North Carolina General Assembly. January 2015. Available at: <http://www.ncleg.net/Sessions/2011/Bills/House/PDF/H438v5>.

2.2. NC Association of Local Health Directors Public Health Task Force. A Blueprint of the Future for Local Public Health Departments in North Carolina. January 2015.

GP3

Speech in Noise, Outer Hair Cell Function, and Working Memory for Trained Flute Players, Kelly A Caldwell, East Carolina University, Greenville, NC

Studies have shown that musicians have better speech in noise (SIN) abilities than non-musician controls (Musacchia et al., 2007, Patel, 2011, Parbery-Clark et al., 2009, Wong et al., 2007). Additionally, Parbery-Clark et al. (2009) found that SIN ability was negatively correlated with working memory. The process of speech recognition requires verbal ability, working memory, recall; these components have previously been examined in musicians (Forgeard et al. 2008, Chan et al., 1998). These studies have found an effect of musical experience on verbal working memory. In the literature, an individual with musical experience has been typically identified as having 7 or more years of consistent formal training, beginning at or before age 10, with at least 3 years of consistent practice (Parbery-Clark et al., 2009, 2012, Musacchia et al., 2007, and Jeng et al., 2010). These studies have compared objective measures for musicians and non-musicians without preference for the type of instrument the

musician plays. Flute perform regularly on instruments exposing them to sound levels between 85 and 122 dBA, and frequencies between 261 and 4186 Hz (Thom et al., 2005). Exposure to high levels of sounds may have a negative impact on outer hair cell function (Bright & Kastner-Wells, 1994). The primary purpose of this research is to determine the relationships between outer hair cell function, speech in noise ability, and working memory. The secondary purpose of this study is to determine the differences between flute players and matched controls on these three variables.

GP4

LOWER BODY BILATERAL WORK ANALYSIS OF IN-STEP SOCCER KICKING, *Kayla Seymore, Patrick Rider, Paul DeVita, Department of Kinesiology, East Carolina University, Greenville, NC*

Introduction: The popularity of soccer worldwide has resulted in many studies conducted in an attempt to understand the fundamental skills required by the sport. The in-step kick is one of the most frequently used kicks in soccer. It is multijoint activity which depends on various factors, such as strength, power, and the transfer of energy between segments. While it is known that both kicking and support limbs contribute to the high-velocity ball delivery of this kick, the kinetic contributions from each limb joint and muscle groups remains unknown.

Objective: The purpose of this study was to examine the power and work done at the hip, knee, and ankle joints in both lower extremities during an in-step soccer kick.

Methods: Bilateral power and work of the in-step soccer kick was assessed for 6 experienced soccer players (3 male, 3 female, 24yrs \pm 2.7, 12+ yrs experience). 3D motion tracking cameras and a force plate were used to capture kicking movements. Data were analyzed with Qualysis Track Manager and Visual 3D software. Power and work, from left foot plant to right ball contact, were calculated in Visual 3D through inverse dynamics.

Results: At left foot plant, positive power and work was produced at the support knee joint and bilaterally at the hip joint (Figs. 1,2). Early-swing, negative work was done at the support knee and ankle, with kicking knee negative work increasing mid-swing. The support limb knee and ankle joints contributed to 55% of the negative work done during the in-step kick, while the kicking limb hip joint contributed to 68% of the positive work.

Conclusions: The kicking limb produces a positive power at the hip, driving the forward leg swing. The support limb produces a negative power at the knee and ankle, slowing and stabilizing the lower body through the kick. Thus, the in-step soccer kick is achieved by a combination of positive and negative work done primarily at the hip and knee joints, respectively, of both the kicking and support limbs.

GP5

A COMPARISON OF SKIPPING AND RUNNING BIOMECHANICS AND METABOLIC COST: A THESIS PROPOSAL, *Jessica McDonnell, Patrick Rider, Sidney Chadwick, Deniqua Nelson, Paul DeVita, East Carolina University, Greenville, NC*

INTRODUCTION: A greater awareness of the benefits of aerobic exercise has led to an increase of the number of people running. While providing health benefits, running mechanics expose the body to high loads and are known to elicit overuse injuries. Skipping exhibits components of both walking and running as seen in the double support, flight, and single limb support phases. The gait pattern is executed with a step and a hop on one leg followed by a step and a hop on the opposite leg. This kinematic pattern is considered more stable gait and results in reduced vertical ground reaction force (GRF) as compared to running. Further, skipping exhibits a higher metabolic demand through a range of commonly employed locomotion speeds. My research will investigate and compare kinematic and kinetic differences between skipping and running at two speeds. There are three related purposes: 1) compare GRFs and lower extremity joint torques and powers, 2) compare tibio-femoral and patello-femoral joint forces, and 3) compare the metabolic cost of skipping and running. We expect to observe lower GRFs, joint torques and powers, and knee joint forces as well as higher metabolic cost in skipping vs. running.

METHODS: 20 subjects will complete a training protocol designed to familiarize participants with proper skipping mechanics and ensure they can skip on a treadmill at the designated speeds. Subjects will perform 5 skipping and running trials at 2.4 and 3.0 m/s. Motion data will be captured and GRF data will be measured using an in ground force platform. Metabolic data will be collected while skipping and running on a lab treadmill. Inverse dynamics will be used to calculate joint torques and powers at the hip, knee, and ankle. Tibio-femoral and patello-femoral forces will be calculated with a biomechanical model. Maximum GRFs, joint torques and powers, and knee forces will be analyzed with 2way ANOVAs with factors of gait and speed with a p<0.05.

DISCUSSION: Running most often presents with overuse injuries largely impacted by the loads imparted on lower extremity tissues. While skipping is currently under-represented in the literature and in practice, based on information available we propose skipping as an alternative form of exercising potentially healthier than running in that GRFs are lower and metabolic demand higher.

GP6

The effect of stride length on patellofemoral and tibiofemoral joint contact forces while running, Collin D. Bowersock, Richard W. Willy, Stacey A. Meardon, John D. Willson East Carolina University, Greenville, NC

Introduction: The yearly incidence rate for running injuries is between 37% and 56%. Repetitive loading of the knee joints experienced during running can contribute to these injuries. Step length has been found to affect patellofemoral joint (PFJ) kinetics; however, the influence of step length on the tibiofemoral joint (TFJ) is less well known. We hypothesized that changing step length would lead to a proportional change in both PFJ and TFJ kinetics per step and per km run.

Methods: Twenty healthy participants (10 male and 10 female) who ran at least twice per week and were between the ages of 18 and 35 were recruited. While running at their preferred pace, participants ran with 90%, 100%, and 110% of their preferred step length. 3-D lower extremity kinematics (240 Hz) and ground reaction forces (2400 Hz) were recorded for 15 seconds in each condition. Hip, knee, and ankle angles and net internal joint moments served as inputs for a biomechanical model to derive PFJ and TFJ force. The total PFJ force, TFJ force, and medial compartment TFJ force per step were calculated as the area under these force curves per step. Total force per km was determined as the product of impulse per step and steps per km in each step length condition. Separate repeated measures ANOVAs were used to test for differences in PFJ, TFJ, and medial compartment TFJ impulse per step and impulse per km among the 3 step length conditions.

Results: Running with a 10% shorter step length reduced impulse per step in the TFJ by 12.5% ($p<.0001$), the medial compartment TFJ impulse by 13.1% ($p<.0001$), and the PFJ impulse by 19.0% ($p<.0001$). TFJ force per km decreased 3.1% ($p<.0001$), medial compartment TFJ force per km decreased by 3.8% ($p<.0001$) and the PFJ force per km decreased by 10.3% ($p<.0001$) when running with a shorter step length. Conversely, running with a 10% greater step length increased the impulse per step in the TFJ by 17.3% ($p<.0001$), the medial compartment TFJ by 17.1% ($p<.0001$), and the PFJ impulse by 25.8% ($p<.0001$). A longer step length also increased TFJ force per km by 6.9% ($p=.003$), TFJ medial compartment force per km by 6.7% ($p=.003$), and PFJ force per km by 14.8% ($p<.0001$).

Conclusions: Decreasing step length at a given running speed appears to decrease PFJ, TFJ, and medial compartment TFJ contact forces. Individuals who have a history of knee injury or pain during running may benefit from utilizing a shorter step length.

GP7

Improving Discourse: A Novel treatment for Adults with Aphasia, Nicole Elise Frisco, Stephen Kintz, Valentyna Hibbs, Amy Henderson, Dr. Heather Harris Wright, East Carolina University, Greenville, NC

The general goal of treatment for people with aphasia (PWA) is to improve their ability to communicate, which involves the discourse level. Treatment at this level is not a new concept, and there are many well-established procedures that utilize the discourse approach. Deficits that PWA exhibit during conversation are often undetectable by standardized testing. Although these deficits may not be detectable by standardized measures, they significantly impact the PWA's ability to maintain social relationships and engage in everyday communication. Multi-level analyses can identify strengths and weaknesses in PWA's discourse that relate to functional aspects of language processing and structural linguistics. These discourse analyses have revealed a more productive investigation of discourse production by more thoroughly documenting linguistic abilities in PWA.

The purpose of this study was to determine if using an intensive discourse processing treatment improved discourse production in adults with aphasia. Study aims included (a) determining if the discourse processing treatment improved performance on measures of micro- and macro- linguistic processes for individuals with aphasia for trained and untrained discourse productions, and (b) determining if treatment effects were maintained.

Participants included four PWA who met study criteria. The study included three phases: baseline, treatment, and maintenance. Baseline took place during week one of the study, treatment was during weeks two, three, and four; and the maintenance phase included data collection one week after treatment and one month post-treatment. Treatment involved twelve sequential picture stimuli and was administered in a four-step procedure.

A multi-level discourse analyses was applied to analyze changes in PWA communication. Preliminary results indicated that the discourse processing treatment resulted in improvements in participant's discourse for trained and untrained productions. The multi-level analysis was more beneficial than standardized measures for analyzing discourse and documenting change in response to treatment.

GP8

PRESENTATION WITHDRAWN

analysis techniques. Diverse views have been expressed, especially among safety and engineering professionals, in the credibility and practicability of qualitative risk analysis as it is described to be more of art than science. To examine this issue, the study will select a group of four different categories of individuals and present two different construction scenarios that have been validated by experts, for the groups to score and rate qualitatively using a risk assessment matrix as a guide. By means of a Comprehensive Decision-Making Model, characteristics of each group will be explored and compared with the corresponding decisions made. The trend of decision, which is the eventual risk rating, will be compared across all four groups for coherence or incoherence. Using an Ordered Logistic Regression statistical analysis the data obtained will be analyzed. The final results would help conclude or not if workplace risk scoring and rating using qualitative analysis techniques is an organized process or a mere exercises.

GP10

Assessing African Americans' Knowledge of Heart Disease and Stroke Symptomatology in North Carolina, *Taylor C. Porter, B.S Public Health Studies; Department of Public Health Master's Student, Brody School of Medicine, Ari K. Mwachofi Ph.D Applied Economic; Department of Public Health Professor Mentor, Brody School of Medicine, East Carolina University, Greenville, NC*

Background: In the United States, heart disease and stroke are the first and fourth leading causes of death while in North Carolina, cardiovascular disease and stroke are first and third. In both the United States and North Carolina, African-Americans have higher death rates in both heart attacks and strokes. Early recognition of both heart attack's and stroke's sign and symptoms can help save the lives. Responses to a telephone-based survey of the Behavioral Risk Factor Surveillance (BRFSS) offer useful data for assessing knowledge of the symptoms..

Objectives: The target population for this study was African-Americans, both males and females, from North Carolina who completed the Behavioral Risk Factor Surveillance Survey (BRFSS) in 2001, 2003, 2005, 2007, and 2009. The overall goal of this study is to see if there is a change in knowledge of heart attack and stroke symptoms in African Americans in North Carolina over the years.

Methods: The data from the surveys was analyzed by SPSS I9 software. Descriptive statistics, t-test of difference in scores overtime and multivariate analysis was done to determined possible sources of the differences.

Expected Results: Compared to other races African-Americans will be less knowledgeable than whites about of the symptoms of heart attack and stroke. Woman among African-Americans will less able to identify symptoms than men because symptoms in woman present differently.

GP9

Uncertainty in Qualitative Analysis and Risk Rating System: Modeling Decision-Making Determinant, *Ogaga Jonathan Tebehaevu, East Carolina University, Greenville, NC*

That nothing is risk free or can be absolutely safe is a general fact (Main, 2002). While this may be the case, assessing risk adequately by assigning levels (low, medium or high) to it is very important as it is the basis for decision making (Anuraj et al., 2013). With workplace risks, the stake for decision making is even greater as high risk interpreted to be low does not only make for wrong decision, but could lead to misallocation of resources and potential life threat to workers (Johnson, 2008).

This study will examine the principles upon which decisions are made in the performance of workplace risk scoring and rating using qualitative

GP11

Experience, Executive Functioning, and the Environment: An Analysis of Factors that Impact Scanning Ability, Stephanie Nicole Biggs, Anne E. Dickerson, PhD, OTR/L, FAOTA, Department of Occupational Therapy, College of Allied Health Sciences, East Carolina University, Greenville, NC

Driving as a means of community mobility enables individuals to participate in meaningful and needed occupations. An inability to drive may result in reduced opportunities to engage in those occupations, creating a need to address this valued activity. Scanning the environment is a critical safe driving skill and is likely impacted by factors including driving experience and executive functioning. This research examined the use of the computer-based assessment tool in determining relationships between scanning, environmental demands, and driver characteristics. The Expert Search and Scanning Skills (ES3) is a computerized assessment tool that automatically generates data regarding users' scanning performance across various environments. These environments range from a rural road to a city street within a highly populated urban area. The driving environments are represented through four distinct videos which increase in complexity and the demands placed on an individual's ability to scan an environment. Users indicate what they are looking at by using the computer mouse and the ES3 automatically records data regarding the number of targets detected, the percentage of time fixating on certain areas of the driving environment, and the percentage of time spent either scanning the environment (represented by an activity score) or fixating on specific targets.

This exploratory study combined data from an earlier study that focused on experienced drivers and novice drivers with new data regarding drivers with and without impairments that could impact executive functioning. The ES3 provided interval level data that was used in a 2 (novice, experienced) x 2 (neurologically typical, presence of conditions) factorial design to examine relationships and evidence for validity of the ES3. The researchers will specifically examine activity and fixation scores along with the percentage of priority targets detected to determine if differences exist between groups of drivers who should theoretically differ in their scanning performance.

GP12

Noise Exposure Assessment among Groundskeepers: A Pilot Study, Adam J. Mannarino^{1,2}, Jo Anne G. Balanay¹, Gregory D. Kearney²

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Approximately 921,900 workers are employed as groundskeepers in the United States. Groundskeepers perform various tasks (e.g., mowing, trimming) and use a variety of tools (e.g., mowers, chain saws) that expose them to high noise levels, increasing their risk to noise-induced hearing loss (NIHL). Several studies on noise exposure and NIHL in other job

sectors have been published, but those on groundskeepers are very limited. This study aims to characterize the noise exposure of groundskeepers, to assess their knowledge, perceptions and attitudes on noise, NIHL and hearing protection device (HPD) usage, and to determine the relationship between workers' knowledge, attitudes/ perceptions and HPD usage. ECU groundskeepers (n=50) were recruited to participate and asked to complete a survey at the start of the study (pretest) and after completing an educational training (posttest) to assess worker knowledge and perceptions on noise and wearing HPDs. A sub-sample of participants was monitored over their entire work shift for personal noise exposure by wearing personal noise dosimeters at shoulder level, 4 inches from the ear. Using 2 different dosimeter settings (OSHA and NIOSH), the time-weighted averages (TWAs) and I-minute averages of noise exposure levels (in dBA), and daily noise exposure dose (in %) were obtained. The participants were also asked to fill out an activity card daily to document their tasks, tools used, location and noise perception. The obtained noise exposure data were compared to various occupational exposure limits for noise to determine if the exposure is at an acceptable level. Sound pressure levels (SPLs) produced by various groundskeeping equipment and tools were measured at full throttle near the ear of the operator using a sound level meter. These measurements were used to assess the worker noise exposure profiles, particularly the contributing source of noise. Preliminary results show that the overall average OSHA and NIOSH TWA noise exposures were 82.2 (range of 50.9 – 100 dBA) and 87.8 dBA (range of 67.2 – 102.9 dBA), respectively. Among the 5 work areas, groundskeepers assigned in the North Recreational Complex had the highest average OSHA (86.1 dBA) and NIOSH (90.2 dBA) exposures and highest % of OSHA TWAs exceeding 85 (71.4%) and 90 dBA (28.6%). The SPLs of equipment and tools used ranged from 75 – 106 dBA, with the wood chipper having the highest SPL. Of those workers surveyed, 70% stressed the importance of the use of earplugs in reducing NIHL; 50% believed earmuffs were important in reducing NIHL; 33% reported always using earplugs, while 3% reported always using earmuffs while on the job; 43% reported experiencing ringing in the ears. The results of this study may provide groundwork for the development of a hearing protection program to prevent NIHL among groundskeepers. The difference in noise exposures may be due to the different types of equipment used by the workers.

GP13

The Effects of Running Speed per Unit Distance on Total

Load of the Lower-Extremities, Kayla Leighann Murphy

Patrick Rider, Paul DeVita, Ph.D., East Carolina University, Greenville, NC

Running is common for exercise and recreational activity; however it is also associated with many injuries. Previous studies on running have shown that speed has a positive correlation with load: faster running has higher ground reaction (GRF), muscle, and joint forces on a per-step basis. Thus reducing stride length and running speed are interventions used to reduce the risk of running injury. Newer work however has shown that due to using fewer steps, total accumulated loads in running can be equal to that in walking over a unit distance. Since fewer steps are needed per unit distance at faster vs slower running, it is hypothesized that despite

larger forces per step, running at faster vs slower speeds will reduce total accumulated biomechanical load per unit distance. The purpose of this study was to investigate the effects of running speed on ground reaction forces and knee joint forces summed over 1 km of running. We expected to observe an inverse relationship between running speed and total load over this unit distance.

3D motion-capture and force platform data were obtained on 16 participants (7 males, 9 females; age 22; mass 65 kg) running at 2.68, 3.35 and 4.46 m/s. Inverse dynamics and a musculoskeletal model were used to calculate patellofemoral (PF) force per step. Step length was used to find total steps per kilometer at each speed. Total accumulated maximum GRF and PF forces were computed per km based on step length for each condition and compared with 1-way ANOVA, $p < 0.05$. Step length was significantly longer (2.77 v 2.41 v 2.06 m) and number of steps were significantly lower (372 v 420 v 491) as speed increased (all $p < 0.05$). Total load per kilometer assessed as summed maximum GRFs and PF forces were significantly lower at the faster vs slower speed, $p < 0.05$. Data supported the hypothesis that as speed increased, total load was reduced per unit distance. We suggest that if running injuries occur due to total accumulated loads vs peak loads per step, running at faster speeds may reduce injury rate.

scenario using printed directions on the IDS. Driving performance under all conditions was measured using a modified Miller Road Test. Scores on 3 clinical assessment tools, AMPS, Trails A and B, and UFOV were compared to the driving performance outcomes because these tools measure aspects of executive function which controls wayfinding ability. Results: Preliminary analysis indicates that driving performance is improved when individuals are receiving directions from a GPS. Ongoing analysis searches for links between clinical assessments and components of on-road driving performance while wayfinding. This knowledge will assist practitioners in comprehensively evaluating driving and determining if clients possess adequate abilities for driving safely while wayfinding. Results could streamline evaluation time and costs, as well as inform occupational therapists of the potential for GPS use to increase driver safety.

GP14

Driving performance while wayfinding on-road and in an interactive driving simulator, Lauren M Cochran

Anne E Dickerson, Ph.D., OTR/L, FAOTA, East Carolina University, Greenville, NC

Driving is a key component of the American Occupational Therapy Association's description of community mobility, an instrumental act of daily living (AOTA, 2008). In order to be executed properly, this complex task requires multiple physical and cognitive client factors to be intact. In addition to being able to safely operate a vehicle, drivers need wayfinding skills. When cognitive and physical changes are suspected to be altered due to illness, injury, or aging, driving assessments may be necessary to determine if individuals can safely drive. To assess driving fitness, it is imperative that all components of driving are evaluated with tools supported by evidence. Limited research has investigated how wayfinding affects driving. This study explores the feasibility of using an interactive driving simulator (IDS) to evaluate driving fitness while drivers are focused on navigation. Additionally, this study examines how different wayfinding techniques (i.e., GPS, printed directions) impact driving performance. This study aims to answer: (1) How does driving performance on the route finding tasks of an IDS compare to on-road driving performance when wayfinding using printed directions? and (2) Is there a difference in on-road driving performance when navigating unfamiliar routes with printed directions versus GPS guidance? Participants were healthy, licensed drivers, ages 22-44. Measures: There were 8 conditions with 24 subjects, counterbalancing 2 unfamiliar, on-road routes (printed directions vs. GPS) and a simulated driving

GP15

Postural Responses to Perturbations in People with Diabetic Neuropathy, Matthew Becker¹, Stacey Meardon², Zachary J. Domire¹, Sungahn Kim³, Paul DeVita¹, ¹Department of Kinesiology, East Carolina University, ²Department of Physical Therapy, East Carolina University, ³Department of Engineering, East Carolina University, Greenville, NC

Individuals with diabetic neuropathy are significantly less stable during quiet and perturbed standing than individuals without diabetic neuropathy. They exhibit higher center of pressure (COP) sway velocity and sway excursion. Virtual time-to-contact (VTC) has been shown to be more sensitive in assessing postural stability in people with other neurological conditions, such as multiple sclerosis and concussions, than sway excursion. VTC has not, as of yet, been used to assess postural stability in people with diabetes or diabetic neuropathy. VTC establishes a boundary of support around a person's feet when standing and calculates how long it would take that person's COP to reach that boundary, given current instantaneous position, velocity, and acceleration. If the COP reaches the boundary of support, the person will either fall or have to catch him or herself. We hypothesize that VTC will provide a more sensitive measure of postural stability for people with diabetic neuropathy. The purpose is to compare the relationships of VTC and sway excursion with severity of diabetic neuropathy in anteroposterior (AP) and mediolateral (ML) perturbations in people with diabetic neuropathy. The results of this study could be used to create a diagnostic tool for risk of falling and severity of neuropathy.

Three-dimensional motion capture and force plate data were collected on 5 participants. All participants had diabetes, with 2 having diabetic neuropathy. Participants were perturbed on a NeuroCom Research Module. Perturbations were at 2 speeds, 10 cm/s and 20 cm/s and lasted for half a second. Force plate data was collected at 200 Hz for 5 seconds following each perturbation. Perturbations were forward, backward, left, right. The clinical tests for vibratory threshold and sensation threshold were also performed on both feet. VTC was calculated using force plate data and measured foot locations in MATLAB. Both VTC and sway excursion were regressed with results from clinical sensory testing. Preliminary data on the first 5 participants has shown a couple of strong correlations ($r > .8$). Sway excursion during the 1 second recovery period for AP perturbations showed strong correlations with the both clinical sensory tests on both left and right feet. During ML perturbations, minimum VTC showed strong correlations with both clinical sensory tests on both feet. Also during ML perturbations, average VTC showed strong correlations with vibratory threshold.

This preliminary data seems to show that both sway excursion and VTC do have relationships with clinical sensory threshold testing in this population. Sway excursion is better suited for measuring AP perturbations in this population, while VTC is better suited for measuring ML perturbations in this population.

GP16

Health Literacy among Pregnant Women at an Academic Obstetrics Clinic in Eastern North Carolina, Madison Preib¹, Juhée Kim, ScD^{1,2}, Edward Newton, MD³, ¹Department of Public Health, Brody School of Medicine, ²Center for Health Disparities, East Carolina University, ³Brody School of Medicine, Obstetrics & Gynecology, East Carolina University, Greenville, NC

Background: Health literacy is the ability of an individual to access, understand and use medical information in a way to promote and maintain good health. A patient's health literacy level is related to risk for chronic disease. There is limited information about health literacy among pregnant women, which may impact the health of mother and child.

Purpose: The purpose of this study is to understand health literacy in pregnant women receiving prenatal care at an academic OB/GYN clinic in Eastern North Carolina.

Methods: About 100 pregnant women 18 and older will be recruited from the Brody School of Medicine OB/GYN clinic over a 3-month period in 2015. Health literacy levels are measured using the Short Test of Functional Health Literacy in Adults (s-TOFHLA) and the Newest Vital Sign test (NVS). Scores from the s-TOFHLA and NVS are grouped into 3 categories: inadequate, marginal, and adequate literacy levels for each test. Participant's pre-pregnancy BMI, gestational age at time of survey, and other socio-demographic variables (race, age, education, chronic disease status) are collected; Analysis will be conducted in SPSS to explore associations between literacy level and other factors.

Results: Preliminary data based off 15 participants suggests that most participants have an adequate health literacy level as measured by the s-TOFHLA. Results from the NVS test suggest that one-half of the study participants have limited health literacy. Level of health literacy may vary by gestational age at enrollment, pre-pregnancy BMI, race, and education. Complete results will be available at the time of presentation.

Conclusions: Limited health literacy during pregnancy may be evident in this patient population. The results from the NVS test indicate that women receiving health behavioral counseling, especially for nutrition education, during pregnancy may have limited effectiveness.

Implications for Practice/Future Directions: There is great need in nutrition education for incorporating health literacy at low-income obstetric clinics. Further understanding of health literacy among pregnant women will allow health care providers to better care for their patient population. The relationship between health literacy and socio-demographic variables in the context of health problems and concerns will be guaranteed.

GP17

Is Breastfeeding Really How It Seems: A Look at Breastfeeding Perspectives and Practice amongst Low Income Mothers in Pitt County, *Tiffany Thigpen¹, Julia Fout¹, Dr. Jubee Kim², Dr. Anne Rafferty¹, Dr. Edward Newton³, Dr. Emily Bray⁴, ¹Department of Public Health, East Carolina University, ²Center for Health Disparities, East Carolina University, ³Department of Obstetrics & Gynecology, East Carolina University, ⁴Department of Family Medicine, East Carolina University, Greenville, NC*

Background: Breastfeeding has proven to be beneficial to both mother and child. The Healthy People 2020 goal is 81.9% of infants will be breastfed, and only 49.8% of mothers in rural counties in North Carolina initiated breastfeeding. Previous studies have identified that mothers face certain barriers and have unrealistic expectations for breastfeeding.

Purpose: (1) To identify common misconceptions of breastfeeding. (2) To determine if mothers who plan to breastfeed before giving birth actually breastfed for 6 weeks after giving birth. (3) To identify different barriers that may prevent mothers from breastfeeding.

Methods: From November 2014 to March 2015, low income, black or white, pregnant women (30 or more weeks) are recruited for the prenatal interview and survey from two study sites, Family Medicine and Brody ObGyn. Target N=30. Perceptions and barriers are measured using pre and post natal surveys and interviews. Valid breastfeeding initiation is obtained using medical chart data. The information from the surveys is analyzed using SPSS v.22 and the interview information is analyzed using Nvivo v.22.

Results: As of January 2015, 24 participants have been recruited. 70.8% of participants are black, and 75% are from the Brody ObGyn study site. 35.7% of participants stated that they were going to exclusively breastfeed, 14.3% stated that they would both breast and formula feed, and 21.4% stated that they were unsure of how they would feed their baby. 49.8% of 16 participants have delivered, and 50% initiated breastfeeding in the hospital.

Implications: The study will identify barriers that may hinder mothers from initiating breastfeeding or breastfeeding for 6 weeks. It will also identify weaknesses and inconsistencies in the support and information that is given to pregnant women by their healthcare providers.

GP18

Lesbian, Gay, Bisexual & Transgender (LGBT) Health Care Concerns, *Glee Lenelle Dunbar, East Carolina University, Greenville, NC*

The need for affordable health care has increased to such volumes that the United States has passed an Affordable Care Act [March 23, 2010]. With the passage of this health care initiative, there has been more focus on vulnerable populations and attempts to ensure that their health care needs are met. Lesbian, gay, bisexual, and transgender (LGBT) health care in the past has been extremely limited or nil. It is argued in this article that there is a need to design and implement effective strategies to address the specific

health care needs of this population. Some specific strategies are: integrated health care planning model, inclusive LGBT representatives in health care decision making, and effective training for practitioners working with this population. There is discussion of the need for more rigorous research to address and evaluate factors in the health care system that may effectively impact successful health outcomes among the LGBT community.

GP19

The Bear Is Catching Up, Let's Run Faster, *Daniel J. Schuster¹, Shane M. Rabideau¹, John Willson, Ph.D.², Patrick Rider¹, Anthony S. Kulas Ph.D.³, Paul DeVita, Ph.D.¹, ¹Department of Kinesiology, ²Department of Physical therapy, ³Department of Health and Education Promotion, East Carolina University, Greenville, NC*

Running biomechanics are well established in terms of ground reaction forces (GRFs), joint torques and joint powers as is the direct relationship between these variables and running speed. Many studies have investigated the differences in these variables when running velocity was increased in discrete increments but investigations of accelerated running in which velocity is continually increasing are almost non-existent. One investigation of the acceleration phase of running showed that joint torques and GRFs did not increase while accelerating. These results cannot be aligned with the fully established results of running biomechanics at different speeds. We expect the joint torques and GRFs to increase during the actual acceleration phase on a step-by-step basis thus agreeing with previous, constant velocity research.

The purpose of this study was to quantify GRFs and lower extremity joint torques and powers during constant speed running and during running while accelerating at two rates of acceleration between a baseline velocity of 2.50 ms-1 to a maximal velocity of 6.00 ms-1. This presentation will only report joint torques. It was hypothesized that there will be an increase in the magnitude of the joint torques with each step during acceleration at the hip and ankle joints only.

4 of 20 planned participants were analyzed on an instrumented treadmill while accelerating at 0.40 ms-2 (A1) and 0.80 ms-2 (A2) from the initial to final velocities. Inverse dynamics were used to determine lower limb joint torques and powers using ground reaction forces and kinematic data collected by 3D motion capture. Correlation and regression analyses were used to identify the relationships between mean, maximum hip, knee, and ankle torques and step number during the acceleration phase. Maximum joint torques at hip, knee, and ankle had correlations of r=0.957, 0.671, and 0.829 respectively with step number in A1 (all p<.05). Maximum joint torques at the hip, knee, and ankle had correlations of r=0.851, 0.467, and 0.885 respectively with step number in A2 with only hip and ankle increasing significantly (p<.05) during accelerated running.

In contrast to the previous study, our data suggest that hip and ankle torques do increase during accelerated running on a step by step basis. Knee torque results need further study but may be directly related to acceleration step number albeit not as strongly as hip and ankle torques.

GP20

Nonprofit Hospitals' Community Benefit Spending: Evidence from NC Nonprofits, Melanie S Morgan, East Carolina University, Greenville, NC

Background: Non-profit hospitals and health organizations receive tax-exemption status from the U.S. Internal Revenue Service (IRS). In return, they have the responsibility to engage in health promotion activities for the benefit of the community. Hospitals' community-benefit spending can vary from charity care to other local resource needs. Therefore, nonprofit corporations are required by the IRS to report their community-benefit activities each fiscal year.

Study Objectives: The aim of this study is to examine community benefits offered by the nonprofit hospitals and health organizations in North Carolina, relative to their tax-exemptions. The purpose of the comparison is to determine whether the nonprofits' tax-exemption is upheld by their benefit to the community.

Methods: This study was conducted by extensive review of IRS tax returns, for fiscal years 2011 & 2012, to gather data on total revenue, expenses, community benefit spending, and value of the tax-exemption for NC nonprofit hospitals and health corporations. The study compared the value of the community benefits to the tax-exemption for these hospitals, by calculating the hospitals' total revenue having been taxed, and utilizing a t-test to detect variability between their total community benefit spending and the result of the difference between the taxed and untaxed revenue.

Expected Results: For many of the NC nonprofits, their total community benefit spending may be less than the value of their tax-exemption. Also, much of the nonprofits' community benefit spending may go towards charity care.

Conclusions: More community benefit efforts may be needed from NC nonprofit hospitals and health organizations to uphold their tax-exemption.

GP21

EFFECTS OF BODY MASS DISTRIBUTION ON CLINICAL MEASURES OF BALANCE IN ADOLESCENT FEMALES, Bivins T, Schmitt K, McMillan AG Human Movement Analysis Lab, Department of Physical Therapy, East Carolina University, Greenville, NC

Introduction: An inverse relationship between body mass and motor performance in children¹ and moderate correlation between BMI Z and balance performance in adolescent females exists.² BMI does not provide information on distribution of excess adiposity.³ Previous work revealed higher BMI correlates with poorer performance on clinical balance tests. Other measures, such as waist circumference (WC), may be more indicative of central adiposity.

Purpose: To determine the relationship between measures of central adiposity and clinical balance measures in adolescent females.

Methods: 60 females, ages 12-17, are being recruited from the community and pediatric healthy weight clinic. 51 are included in this report. Known musculoskeletal, neuromuscular, or cardiopulmonary conditions, which may limit balance performance, excluded subjects. A single data session gathered anthropometric measurements and performance on 3 clinical balance tests (Bruininks Oseretsky Test of Motor Proficiency -2 [BOT-2], modified Balance Error Scoring System [BESS], and Four Square Step Test [FSST]). The Balance subtest of BOT-2 was administered and scored per standardized instructions. Scaled scores were used to normalize effects of age and maturation. The BESS examines single limb and tandem stance on various surfaces with eyes open and closed. It was scored per instructions to obtain a total score for number of errors in each trial. The FSST records time of 2 error-free trials as subjects step over poles in a designated pattern. The fastest trial was recorded. Regression analysis was performed to determine relationships between variables (BMI-Z, WC, BOT-2, BESS, FSST).

Results: BMI Z and WC were significant predictors for BOT-2 but showed weak correlations ($R^2 = 0.24$ and 0.34). BMI Z was the only significant predictor for FSST and BESS scores. BMI Z and WC had weak correlations with FSST scores ($R^2 = 0.15$ and 0.05) and BESS scores ($R^2 = 0.12$ and 0.01). Multi-linear regressions revealed both variables accounted for 35% variance ($R^2 = 0.35$) in BOT-2 scores, 15% ($R^2 = 0.15$) in FSST scores, and 26% ($R^2 = 0.26$) in BESS scores. WC was significant for both BOT-2 and BESS. BMI Z was significant for FSST and BESS.

Conclusion: WC may give insight to balance deficits in overweight or obese adolescent females and can be easily obtained in clinical settings. Further analysis will be performed to determine the relationship of separate aspects of balance. Subject recruitment is ongoing.

GP22

Kinematic Predictors of Tibiofemoral Joint Contact Forces During Running, Amir Reza Sanii, Richard W Willy, Stacey A Meardon, John D Willson, East Carolina University, Greenville, NC

Introduction: Tibiofemoral joint (TFJ) stresses are associated with elevated risk of injury, particularly in individuals with a history of a meniscus or ACL tear. Increased tibiofemoral stresses could lead to OA in older adults. Clinicians today do not have the instruments necessary to assess forces at the joint during running due to the expense of the instruments. The purpose of this study was to see if the forces at the tibiofemoral joint could be accurately predicted during running using only kinematic data.

Methods: 56 recreational athletes between 18-35 years participated in this study. Three-dimensional lower extremity kinematics (240 Hz) and ground reaction forces (2400 Hz) were recorded as participants ran at 3.3 m/s using their preferred strike pattern. These data were used to derive hip, knee, and ankle sagittal plane angles and net internal joint moments, which served as inputs for a biomechanical model to estimate TFJ force during running. Total TFJ force (impulse) per step was calculated as the

area under the TFJ force curve over 5 steps. Six different 3D kinematic measurements were used as possible predictors of average TFJ impulse: peak trunk flexion angle, peak knee flexion angle, peak ankle dorsiflexion angle, vertical excursion of center of mass, knee angle at initial contact, and step length. These variables were entered into stepwise multiple linear regression to identify the variables that best predict TFJ impulse.

Results: Mean TFJ impulse of the sample was 1.24 (.17) BW*s. Five 3D kinematic variables were found to predict over 75% of the variability in TFJ impulse ($\text{Adj R}^2 = .76$, $P < .001$). Using these kinematic predictors it is possible to predict TFJ impulse to within .165 BW*s, resulting in an estimate that is, on average, within 13% of the measured TFJ impulse.

Conclusions: 3D sagittal plane kinematic data alone provide a fair estimate of TFJ impulse during running. Clinicians and researchers with 3D motion analysis capabilities may estimate TFJ impulse during running without ground reaction force data. The results bring into question if these kinematic measurements, achieved using 3D motion capture technology, can be achieved using 2D technology that is pervasive in clinical settings.

GP23

3D Predictors of Patellofemoral Joint Contact Forces in Healthy Individuals, Warren JM, Willy RW, Meardon SA, Willson JD, East Carolina University, Greenville, NC

Background: Patellofemoral joint (PFJ) pain is the most common orthopedic complaint of individuals who participate in running-related activities. PFJ force during running may contribute to this injury. Currently it is not feasible for clinicians to estimate PFJ force during running. The purpose of this study was to identify kinematic measurements that could be used to accurately estimate PFJ contact forces. Methods: 56 individuals ages 18-35 years old provided written consent to participate in this study. All participants reported no injury or surgery in the last calendar year. Three-dimensional (3D) kinematics and ground reaction forces data were recorded during running at 3.3 m/s. Using this data, PFJ contact forces were calculated using a biomechanical model with inputs of hip, knee, and ankle sagittal plane angles and net internal joint moments. Total PFJ force (impulse) per step was calculated as the area under the PFJ force curve over 5 steps. Six different 3D kinematic measurements were used as possible predictors of average PFJ impulse: peak trunk flexion angle, peak knee flexion angle, peak ankle dorsiflexion angle, vertical excursion of center of mass, knee angle at initial contact, and step length. These variables were entered into stepwise multiple linear regression to identify those variables that best predict PFJ impulse during running.

Results: Mean PFJ impulse of the sample was .51 (.13) BW*s. Peak knee flexion, vertical excursion of the center of mass, and peak ankle dorsiflexion were found to predict over 75% of the variability in PFJ impulse ($\text{Adj R}^2 = .76$, $P < .001$). These kinematics alone predicted PFJ impulse to within .13 BW*s, which is within 25% of the mean PFJ impulse in our sample.

Conclusions: The ability to predict PFJ impulse using kinematics alone is

valuable for future research endeavors and clinical practice. Importantly, these 3D predictors can be collected without the use of an instrumented treadmill, which is exceedingly rare in clinical environments. Despite these promising results, prior to clinical application, the estimate would benefit from even greater accuracy and further testing of clinical (two-dimensional) measurements of running kinematics.

GP24

BONE LOADING ACTIVITY AND RUNNING

RELATED STRESS FRACTURE, Zachary A Blank, Department of Physical Therapy, East Carolina University, Stacey A Meardon, Department of Physical Therapy, East Carolina University, Greenville, NC

Introduction: Runners with stress fracture (SF) are reported to have smaller bone geometries and reduced bone strength. Physical activity patterns influence both bone geometry and bone strength. Bone loading history questionnaires, such as the bone-specific physical activity questionnaire (BPAQ), quantify current and historical bone loading activities and have been positively correlated with tibial bone density and strength in both males and females across multiple age groups. The BPAQ could be a useful tool in quantifying physical activity that contributes to bone strength in runners, a population that commonly sustains SF. However, bone loading history has not been examined in runners with SF. In this study, we evaluated differences in current and historical BPAQ-derived bone loading scores in runners with SF and healthy runners (NSF).

Methods: 26 runners with SF (18F and 8M; 22.0 ± 10.3 yrs; 65.1 ± 10.7 kg; 1.7 ± 0.1 m; 30.3 ± 19.1 mi/week) and 43 without (31 F and 12 M; 24.6 ± 7.2 yrs; 65.1 ± 10.7 kg; 1.7 ± 0.1 m; 29.0 ± 18.2 mi/week) were included in this analysis. Tibial stress fracture history was confirmed radiologically at the time of injury for runners with SF. All participants completed the BPAQ; bone loading scores were derived according to Weeks and Beck (2008). Historical bone loading scores were calculated for years prior to stress fracture in the SF group. Group differences in bone loading histories, co-varying for age, were examined with analysis of covariance ($=0.05$). Partial Eta squared (η^2) served as our effect size index.

Results: The SF group demonstrated lower current BPAQ (cBPAQ) scores when compared to the NSF group; a strong effect was observed ($p=0.02$, $\eta^2=0.06$). Modestly lower historical BPAQ (pBPAQ) scores were observed in the SF group as well ($p=0.09$, $\eta^2=0.03$).

Conclusion: Self-report of participation in osteogenic physical activity 12 months prior to survey completion was less in the SF group. This suggests either activity modification due to injury and/or less biopositive loading in runners with SF. Additionally, runners with SF tended to report lower past osteogenic bone loading activities. Individuals with SF or at risk for SF may benefit from exercises to optimize osteogenic potential and enhance bone health. Further research with a larger sample size should continue to examine the relationship between bone loading patterns and SF.

GP25

Single-Leg Squat Mechanics: Differences Among People With and Without ACL Reconstruction, and Association with Running Mechanics, Stephen Waggoner, Katherine Edwards, Meredith Hayek, Vaughn Price, John Willson PhD, East Carolina University, Greenville, NC

BACKGROUND: Anterior Cruciate Ligament (ACL) tears are common in active populations and can negatively affect activity and function, even after surgical repair. The single-leg squat is a common clinical tool to assess lower extremity mechanics, as it is thought to simulate functional weight bearing and athletic positions. Limited research has compared SL squat mechanics in patients with ACL reconstruction and those with healthy knees, with conflicting results. The primary purpose of this study was to compare the frontal plane kinematics during a single-leg squat in people with a history of ACL reconstruction to people with healthy knees. Additionally, we aimed to examine associations between frontal plane kinematics during single-leg squat with frontal plane mechanics during running, to further investigate the usefulness of single leg squat as a clinical tool.

METHODS: 20 people with a history of ACL reconstruction and 20 healthy controls performed single-leg squats and ran at a self-selected pace while trunk and lower extremity kinematics were recorded with 3-D motion capture. Frontal plane knee, hip and pelvis kinematics were compared between groups for the single-leg squat using independent t-tests, and correlations between frontal plane single-leg squat and treadmill running kinematics were evaluated using Pearson correlation coefficients.

FINDINGS: In general, frontal plane kinematics during single-leg squat were similar between people with and without a history of ACL reconstruction. The largest kinematic difference observed between groups was that the ACL reconstructed group exhibited one degree less contralateral pelvic drop than the controls ($p=0.035$). Correlations for single-leg squatting versus running yielded strong positive relationships for peak knee adduction angle ($r=0.850$, $P < .01$) and peak contralateral pelvic drop ($r=0.708$, $P < .01$). Weaker correlations between squatting and running were found between other frontal plane joint angles and excursions.

INTERPRETATION: These results suggest that individuals with ACL reconstruction exhibit single leg squat kinematics that are largely similar to their healthy peers. Also, frontal plane angles at the knee and pelvis during the single-leg squat appear to correlate strongly to peak angles during running, but the total joint excursions do not appear to be strongly related. As such, the single leg squat test may possess some clinical utility as a movement screen for altered running mechanics.

GP26

Cumulative Knee Joint Loads as a Function of Running Speed Among People with and without Anterior Cruciate Ligament Reconstruction, Meredith L Hayek, Edwards K, Willy R, Hollingsworth C, Waggoner S, Price V, Willson J, East Carolina University, Greenville, NC

Introduction: Anterior cruciate ligament (ACL) rupture is a common injury in young adults that predisposes patients to an early onset of knee osteoarthritis (OA). Running is a common choice of activity to maintain a healthy weight. Although peak knee contact forces are greater during running compared to walking, total joint loads per kilometer are similar due to the flight phase of running. Running speed is associated with the flight phase of running. Therefore, the purpose of this study was to test if total patellofemoral joint (PFJ) and tibiofemoral joint (TFJ) contact force during running changed systematically with running speed. The effect of running speed was tested among individuals with and without a history of unilateral ACL reconstruction (ACLR) as people after ACLR may most significantly benefit from interventions to reduce cumulative joint loads during exercise.

Methods: 18 active people 2-7 years after ACLR participated in the study (21.9 years; 13 females/5 males). These participants were matched by sex, mass, and activity level to 18 healthy individuals (21.7 years). Three-dimensional kinematics (200 Hz) and ground reaction forces (1000 Hz) were collected during 5 running conditions on an instrumented treadmill. Running speeds included a self-selected pace, +/- 10%, and +/- 20% of self-selected pace. Bilateral peak PFJ and TFJ contact forces per step and total force per kilometer were collected for 5 steps at each speed using a knee joint model with inputs of sagittal plane hip, knee, and ankle joint angles and net moments during running. Differences between speed conditions and group were evaluated using 2-way mixed model ANOVAs (speed (5) x group (2)) with LSD follow-up procedures ($=.05$).

Results: Main effects of speed were identified for all PFJ and TFJ variables of interest. Peak PFJ and TFJ force each increased 8-10% with a 20% increase in running speed ($P < .05$). However, a 20% increase in speed decreased total PFJ and TFJ force per km by 13-15% ($P < .05$). Across all running speeds the ACLR group demonstrated 8% lower peak PFJ ($P < .05$), 6% lower TFJ knee force per km ($P < .05$), and 13% lower PFJ force per km ($P < .05$).

Discussion: Running is repetitive in nature resulting in high cumulative knee joint loads. Running at an increased training pace may shield PFJ and TFJ articular cartilage from a proportion of these loads thought to contribute to degenerative processes associated with OA among people with and without a history of ACLR.

The Influence of ACL Reconstruction Surgery on Frontal and Sagittal Plane Motion at the Knee During a Single Leg Landing from a Jump, Elisabeth Flannery, Kristen Garrison, Walter Jenkins, John Willson, Human Movement Analysis Laboratory, Department of Physical Therapy, East Carolina University, Greenville NC

Purpose: To assess how anterior cruciate ligament reconstruction (ACLR) surgery influences knee kinematics and kinetics during bilateral jumping and single-leg landing.

Introduction and Clinical Relevance: Research has found that within 10 years following an ACLR 1 in 3.7 patients will experience a second ACL injury. Decreased knee flexion and adduction motion and vertical ground reaction force has been reported in the ACLR lower extremity during bilateral drop-landings. Single-leg hop tests showed reduced knee flexion motion and knee extension moment while landing on the ACLR limb. The influence of ACLR on knee motion during single-leg landing has not been extensively examined, as motion analysis literature with ACLR patients has focused on bilateral drop-landings leaving a relative void in single-leg landing research comparing uninvolved and ACLR limbs.

Methods and Measures: Eighteen subjects (14F/4M) two to seven years post ACLR. Participants performed single-leg landings with both their uninvolved and ACLR lower extremity from a vertical jump to 75% of their maximum jump height. Subjects completed 6 consecutive jump-landings on each lower extremity. Kinematics were recorded at 240 Hz with an 8-camera motion analysis system and ground reaction forces were recorded at 2400 Hz. Joint angles and moments were used as inputs to a biomechanical model to estimate vertical and anterior shear knee joint contact forces. Differences between knee joint kinematics and kinetics were evaluated using paired T-tests ($\alpha < 0.05$) during the first 60% of the landing cycle.

Results: Significant differences were observed for peak knee flexion motion (6° less for ACLR; $p=0.008$), knee flexion excursion (8° less for ACLR; $p=0.0001$), peak patellofemoral joint reaction force (1.8 body weights [BW] less force for ACLR; $p=0.012$), peak posterior to anterior tibiofemoral force (0.5 BW less force for ACLR; $p=0.001$), peak superior to inferior tibiofemoral force (1.5 BW less force for ACLR; $p=0.03$), and peak knee flexion moment ($0.4 \text{ N}^*\text{m}/\text{kg}^*\text{m}$ less for ACLR; $p=0.005$).

Discussion and Conclusions: Subjects two to seven years post ACLR had significant between limb differences in lower extremity kinematics and kinetics during jump-landings. Current literature on second ACL injury following ACLR describes between limb differences in lower extremity motion as a risk factor for ACL injury. The results of this study may provide information pertinent to the epidemiology of second ACL injury.

EFFECTS OF OBESITY ON SIX-MINUTE WALK TEST IN ADOLESCENTS, Leonard K¹, Collier DN², Brinkley J³, McMillan AG¹, ¹Department of Physical Therapy, ²Brody School of Medicine, ³Department of Biostatistics, East Carolina University, Greenville, NC

Introduction: Differences in fitness measures in obese (OB) vs healthy weight (HW) adolescents and changes in fitness with interventions, have not been reported for minority adolescents in rural, low socioeconomic areas, where obesity rates are high¹. The purpose of this study was to determine the effects of obesity and a camp-based intervention, on fitness measures and Six Minute Walk Test (6MWT) in adolescents.

Methods: Thirty OB subjects (12 to 17 yr) who had a BMI $\geq 95^{\text{th}}$ percentile for age and gender were recruited from a camp-based weight management program. Subjects had no health conditions which would limit their participation¹. Thirty HW subjects were recruited from the community and matched to OB subjects on age, gender, and race. 6MWT data were collected at four times: prior to the start of a camp (for the OB group), and at 3, 6, and 12 months after end of camp. Heart rate (HR) was monitored using a Polar HR monitor (Polar Inc, Kempele, Finland) at rest before 6MWT, at 2 min intervals during 6MWT, and at rest 5 mins post 6MWT. Student's t-tests were used to determine differences between groups prior to intervention and changes in OB group after camp.

Results: Prior to camp, OB subjects demonstrated a significantly higher resting HR (OB= 93.3 ± 14.9 bpm, HW= 83.6 ± 10.5 bpm; $p=0.006$) vs HW peers. The OB adolescents also walked a significantly shorter distance during 6MWT prior to camp (OB= 410.3 ± 46.8 m, HW= 474.4 ± 67.9 m; $p<0.0001$). When considering only those who returned for all data collections ("completers": OB n=13; HW n=10), steady declines (pre-camp to 12 mon post-camp) were noted for OB subjects' HR at 6 min (end of 6MWT: OB pre= 140.0 ± 19.23 bpm, OB 12mon= 128.4 ± 18.65 bpm; HW pre= 118.8 ± 15.13 bpm, HW 12 mon= 116.7 ± 12.74 bpm). This 6min HR post-6MWT was ≥ 5 bpm lower post-camp in 15 OB subjects, and this improvement was mostly sustained across all time points. Using a search algorithm, we found 93% of those 15 OB subjects who had decreased HR walked ≥ 383.3 m at baseline ($p<0.0124$). Analysis is ongoing to determine if 6MWT distance is an indicator of likely success with this camp-based intervention.

Conclusion: Prior to intervention, OB adolescents exhibited lower 6MWT distance and had higher resting HR, vs HW peers. HR post 6MWT was improved in 15/30 OB subjects after intervention. A camp-based intervention may improve fitness in OB adolescents, and 6MWT distance may be a predictor of which adolescents will benefit from a camp-based intervention.

GP29

Factors Correlated with Between-Limb Tibiofemoral and Patellofemoral Joint Load Asymmetry Following Anterior Cruciate Ligament Reconstruction, Vaughn Price, Meredith Hayek, Katherine Edwards, Stephen Waggoner, Chelsea Hollingsworth, John Willson Department of Physical Therapy, East Carolina University, Greenville, NC

Background: Asymmetrical loading of patellofemoral (PFJ) and tibiofemoral (TFJ) has been observed following anterior cruciate ligament reconstruction (ACLR) surgery. This asymmetry may increase risk of knee joint osteoarthritis due to structural damage to the articular cartilage. However, factors that are associated with this knee joint loading asymmetry have not been fully described.

Purpose: To investigate the role of quadriceps strength, fear of movement, symptoms, and time elapsed since surgery as factors correlated with TFJ and PFJ load asymmetry 2-7 years after ACLR surgery

Methods: This study involved 20 participants with a previous ACL reconstruction of one limb at least 2-7 years prior to study entry. Participants completed self-reported questionnaires for kinesiophobia and knee joint symptoms, performed isometric knee extension strength tests, and three-dimensional analysis of lower extremity kinematics (200 Hz) and ground reaction forces (1000 Hz) while running at a self-selected pace. Bilateral PFJ and TFJ contact force were calculated using a knee joint model with inputs of sagittal plane hip, knee, and ankle joint angles and net moments during running. Pearson correlations were used to quantify the associations of strength, fear of movement, knee joint symptoms, and time since surgery, with PFJ and TFJ impulse symmetry between legs. Multiple linear stepwise regression was also used to predict asymmetry using only those factors with a significant bivariate correlations.

Results: PFJ impulse was 20% less ($P < .01$) and TFJ impulse was 10% less ($P < .01$) in the ACLR leg. TFJ loading asymmetry was correlated with knee extension weakness ($r=.51, P = .02$) and increased symptoms ($r=.52, P = .02$). Combined, these two factors accounted for 46% of the variability in TFJ impulse asymmetry between limbs ($P = .005$). Fear of movement and time between surgery and data collection were not found to correlate with knee joint loading asymmetry during running.

Conclusion: Two to seven years following ACLR, patients continue to demonstrate asymmetries in joint loading during running. Quadriceps weakness and knee symptoms were found to have a meaningful relationship with TFJ kinetic asymmetry during running, while time elapsed since surgery and fear of movement did not. Rehabilitation efforts to restore quadriceps strength and minimize knee joint symptoms may improve asymmetry in knee joint loads typically observed in this population.

GP30

Navicular Drop and Tibial Mechanical Axis: Relationship with Running Mechanics Associated with Tibial Stress Fracture, Emily J Brown, Richard Willy, Michael Baggaley, Walt Jenkins, & Stacey A. Meardon, East Carolina University, Greenville, NC

Introduction: Females with tibial stress fracture (TSF) demonstrate increased average vertical loading rate (AVLR), hip adduction (HADD), and rear foot eversion (REV). Frontal plane angle of the tibia (shank angle) during running has also been related to TSF. Navicular Drop Test (ND) and the mechanical axis of the tibia (TMA) are easily obtained clinical measures that may relate to these key predictors of TSF. ND quantifies amount of foot pronation while TMA is a static measurement reflecting frontal plane alignment of the tibia in standing.

Purpose: To examine the relationship of ND and TMA with AVLR, HADD, REV, and shank angle during running

Methods: 3 trials of ND and TMA were obtained from 15 healthy female runners (24.0 ± 3.0 yrs; 21.4 ± 2.4 kg/m²; currently running >16 km/wk). ND quantified the sagittal plane displacement of the navicular tuberosity from a neutral position in sitting to a relaxed position in standing; it was measured by marking the start and end position of the navicular on an index card. TMA was considered the frontal plane angle of a line bisecting the midline of the tibial tuberosity and the neck of the talus; it was measured using an inclinometer in a standardized position. Following an acclimation period, kinematic and kinetic data were collected via a 3D motion capture system while subjects ran on an instrumented treadmill at a self-selected speed for 20 sec. Bivariate correlations were used to examine the relationships between ND, MAT and dependent variables of interest ($=0.05$).

Results: ND was negatively correlated with AVLR ($r=-0.459; p=0.043$) and peak HADD ($r=-0.630; p=0.006$). No meaningful relationship was observed between ND and REV ($r=0.207; p=0.230$) or shank angle ($r=-0.035; p=0.451$). TMA did not demonstrate any meaningful relationship with AVLR ($r=-0.145; p=0.303$), HADD ($r=-0.092; p=0.372$), REV ($r=-0.187; p=0.252$), or shank angle ($r=0.108; p=0.351$).

Discussion: The negative correlation of ND with AVLR suggests that runners with less foot pronation experience greater peak HADD during the stance phase of running. Therefore, it appears the hip is tasked with compensating for the loss of pronation in female runners. Additionally, reduced ND appears to be related to higher AVLR signifying reduced impact attenuation capabilities in runners with limited pronation. Since both increased HADD and AVLR during running are considered risk factors for TSF, ND may be a useful clinical measure to screen for TSF risk.

¿UNIDA PERO DIVIDIDA?: A QUALITATIVE ANALYSIS OF DISPARITIES IN ACCESS TO HEALTHCARE BETWEEN PREGNANT DOMINICAN AND HAITIAN WOMEN LIVING IN THE DOMINICAN REPUBLIC,
Tierra Simmons, East Carolina University, Greenville, NC

Inequality refers to differences experienced by advantaged and disadvantaged populations or individuals, where the disadvantaged social group who has continuously experienced discrimination and hindrance is worse off physically, mentally, socially, financially, etc. Inequality establishes a distinction between the privileged and the disadvantaged. Inequity is an ethics-based principle that further puts the unprivileged at a disadvantage. Seeking health equity means pursuing the elimination of health disparities (Braveman). This research project attempted to establish and better understand disparities, or inequalities, concerning access to healthcare between pregnant Haitian and Dominican women residing in the Dominican Republic through a qualitative analysis with the goal of bringing awareness to the subject. With the ever-growing issues of immigration, healthcare inequity, and maternal/neonatal fatality rates, data collected from this project will serve as an important source for physicians, medical students, and healthcare employees alike. Results can be utilized to better comprehend and be able to combat these issues, eradicate healthcare inequity, bring awareness to this potential developing issue, and to preliminarily delve into probable explanations behind healthcare inequity.

A series of key informant interviews with various selected healthcare providers within hospital/clinical settings in the urban city of Santo Domingo served as the primary method of research. The target groups of women accessing healthcare services were the focus of the observational approach to this research study. Exchanges and activities observed were inclusive of routine patient care activities and upkeep/infrastructure of the facilities.

Key informant interviews revealed that healthcare disparities do exist in the Dominican Republic. However, unlike the hypothesis, physicians disclosed that disparities in healthcare are due to inequality in wealth and social status more so than ethnicity or nationality. Yet, as a whole, Haitians residing in the Dominican Republic are poorer than most Dominicans and can face language barriers, health insurance inaccessibility, and challenges navigating an unfamiliar healthcare system, all of which may lead to a healthcare disparity. In conclusion, although there may be little discrimination based on ethnicity or nationality, classism is the larger issue within the Dominican healthcare system, with a significant difference in quality of care between public and private hospitals. Supported by The Department of Bioethics and Interdisciplinary Studies and International Service Learning.

A HOLOCENE PALEOCLIMATE RECONSTRUCTION OF THE SUNDA SHELF (SOUTH CHINA SEA), PENINSULAR MALAYSIA,
HINDES, Haley E., CULVER, Stephen J., LEORRI, Eduardo, MALLINSON, David J., Department of Geological Sciences, East Carolina University, Greenville, NC

The East Asian monsoon (EAM) system influences precipitation and continental runoff into the shallow coastal waters of the Sunda Shelf (South China Sea). Given the importance of the EAM to agricultural activities in SE Asia, it is important to understand past changes in the strength of the monsoon so that the range of future changes can be understood. Paleoclimatic records are lacking from the Sunda Shelf due to the generally thin Holocene sedimentary record. However, incised valleys in the shelf during previous glaciations that have been flooded and in-filled during the Holocene can provide a thicker sedimentary record that may have an important climatic record.

To test this hypothesis, three ca. 2m gravity cores were collected ca. 50km off the coast of Kuala Terengganu, peninsular Malaysia. The station was in approximately 60m water depth and in a sediment-filled paleo-valley most likely formed by the Terengganu River during lower sea levels. Two of the three cores selected for further analysis, TERI4-GC5 and TERI4-GC7, and comprise an offshore extension of a previously collected suite of cores. Both cores were sampled at 1cm intervals. The chronology for the cores, based upon AMS radiocarbon analysis of inorganic marine carbon of the benthic foraminifer *Cavarotalia annectens*, indicates a ca. 9,000 year sedimentary record. The profile of bulk sediment magnetic susceptibility reveals a down core change at ca. 4,000 yr BP that might be related to a decrease in continental run-off and hence precipitation. Bulk sediment elemental analysis and oxygen stable isotopic analysis of the planktonic foraminifer *Globigerinoides ruber* will supplement BMS data in order to support these inferences of late Holocene paleoclimate in the Sunda Shelf.

GP33

Physiological Responses of Anuran Larvae to Predation Cues,

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Predators are known to cause prey to alter their morphology, life history or behavior in ways that reduce the likelihood of the prey being consumed by the predator. Seldom considered, however, are the consequences of predators on internal morphology (e.g., gut length) or physiology that may have important consequences for prey growth. We conducted an experiment where we ascertained whether predators induced changes in prey gut length or physiology. We found that tadpoles raised with predators had shorter guts but rearing environment had no effect on the metabolic rate of tadpoles or their body mass or survival. We also ascertained whether tadpoles alter their metabolic rate in response to visual and/or chemical cues from predators. Chemical cues from predators caused tadpoles that were not raised with predators to alter their metabolic rate but did not alter the metabolic rate of tadpoles raised with predators. Smaller tadpoles reared without predators reduced their metabolic rate by 45% in response to chemical cues while larger tadpoles reared without predators enhanced their metabolic rate by 370% in response to chemical cues. Chemical cues caused the metabolic rate of tadpoles reared with predators to be 76% lower than that observed in tadpoles reared without predators. Visual cues did not influence the metabolic rate of any tadpoles nor did it influence the effect of chemical cues on metabolic rate. Our results suggest that the tradeoff between costly predator defenses and growth may at least partially originate in prey physiology but further investigation is needed.

GP34

Distribution and taxonomy of modern benthic foraminifera of the Sunda Shelf (South China Sea), Peninsular Malaysia, Samuel Q. Martin, Stephen J. Culver, Eduardo Leorri, David J. Mallinson, Department of Geological Sciences, East Carolina University, Greenville, NC

Benthic foraminifers and their distribution patterns play a major role in understanding past and present marine environmental conditions. Foraminiferal assemblages have not been thoroughly researched along the shallow coastal of Kuala Terengganu, Peninsular Malaysia. The purpose of this study is to document the taxonomy and distribution of this region for the first time and, therefore, provide a model for interpreting environmental changes preserved in the sedimentary record.

Surface sediment was collected from two parallel transects encompassing 16 sampling stations on the Sunda Shelf for analysis of modern shallow-water (5-60 m) benthic foraminifera. At least 300 foraminiferal specimens were picked from the 150-1,000 µm

fraction of each sample, with ~100 different species identified. The foraminifers collected are primarily calcareous hyaline, but agglutinated and calcareous porcelaneous species are also present in most samples. Preliminary observations show an increase in species diversity and foraminiferal abundance with increasing water depth. Sediment samples collected at intermediate depths (20-41 m) revealed many specimens whose original calcium carbonate tests had been infilled by a dark green authigenic mineral. Using X-ray Diffraction (XRD), the unknown mineral will be identified to determine the environmental origin of these specimens. Once all specimens are identified, cluster and multiple discriminant analysis will be used to describe species distribution patterns and environmental associations in the area of study.

GP35

The maize male sterile fuzzy tassel mutant makes abnormal stamens that fail to produce mature pollen., Sterling Field and Beth Thompson, East Carolina University, Greenville, NC

The maize fuzzy tassel (*fzt*) mutant is caused by a mutation in *dicer-like1* and has broad developmental defects. *dicer-like1* encodes a key enzyme for microRNA (miRNA) biogenesis and many miRNAs are reduced in *fzt* plants. *fzt* plants are shorter in stature than normal siblings and have shorter, narrower leaves. *fzt* also has striking inflorescence defects; inflorescence meristems are fasciated and other meristem types in the inflorescence are indeterminate. *fzt* is male and female sterile. *fzt* does not initiate obvious stamens in all inbred backgrounds, but in inbreds that do, the stamens develop abnormally. To understand the cause of male sterility in *fzt*, we compared stamen development in *fzt* and normal siblings. *fzt* stamens are smaller than normal siblings, often have twisted and shriveled locules, and range in color from yellow to dark brown. In contrast, normal sibling stamens have uniform smooth, yellow locules. To further investigate the *fzt* stamen defects, we compared development of *fzt* and normal siblings stamens in fixed, sectioned tissue. Early stamen development in *fzt* was indistinguishable from normal siblings. Later in development, however, *fzt* stamens had enlarged tapetum, shriveled pollen, and collapsed locules. Some *fzt* stamens contained pollen that appeared morphologically normal, but most of the pollen was not viable based on Alexander staining. Normal pollen is all tricellular at maturity; *fzt* pollen was a mixture of uni-, bi-, and tricellular pollen, indicating pollen development was arrested at multiple developmental stages. Pollen in normal siblings is loaded with starch before dehiscence. *fzt* pollen, however, failed to accumulate starch, suggesting that even pollen that developed to late stages arrested before maturity. We hypothesize that misexpression of specific miRNA targets underlies the *fzt* stamen defects and are currently examining expression of miRNA target genes with known roles in stamen development in other plants.

GP36

Quantitative study of 3D morphology of MCF-7 cells in different stages of apoptosis, Zhan Chen, East Carolina University, Greenville, NC

Apoptosis is the process of programmed cell death of fundamental importance to many branches of life science and clinical research including gauging a cancer patient's response to treatment. Cell apoptosis is characterized by morphological changes including membrane blebbing, cell shrinkage and nuclear fragmentation before the final breaking up into apoptotic bodies. Since these changes are the defining features of apoptosis, it is important to develop a method for quantitative determination of the relationship between the apoptosis stages and the morphological variations. In this project, we selected the MCF-7 breast cancer cell line to investigate their changes in 3D morphology in the apoptosis process induced by Doxorubicin, which is considered to be the most effective agent in the treatment of breast cancer patients. The Doxorubicin treated MCF-7 cells are labeled by FITC Annexin V and PI to differentiate cells into viable, early apoptotic and late apoptotic groups. Cells in each group at different post-treatment times are further stained with Syto-61 and MitroTracker Orange fluorescent dyes obtain confocal image stacks for segmentation of nucleus and mitochondria and subsequent 3D reconstruction. This allows us to calculate morphology parameters such as volumes, perimeters, irregularities, of the cytoplasm, nucleus and mitochondria, which play critical roles in the apoptosis process. We will presents the 3D morphology parameters of the MCF-7 cells in different stages of apoptosis. Comparison of these data provides the opportunity in the future for accurate and label-free detection of apoptosis in single cells with the diffraction imaging flow cytometry method.

GP37

Radiation and the Survival of Ancient Life, Colleen Kelleher, Dr. Regina DeWitt, Department of Physics, East Carolina University, Greenville, NC

In the search for life on Mars, permafrost is considered a primary target for possible dormant microorganisms. A major factor that impacts the ability of microorganisms to survive is the amount of ionizing radiation they are exposed to. Permafrost is a mixture of ice and minerals, and on a microscopic scale represents a highly non-uniform radiation environment. There have been many studies to examine the radiosensitivity of various microorganisms, but there still exists a lack of quantitative data regarding background radiation in permafrost. Our goal is to obtain these data, as it is crucial for determining the survival probabilities of microorganisms buried in permafrost.

Three types of radiation emitted from radionuclides in permafrost are alpha, beta, and gamma radiation. Each type of radiation has been considered separately, since each differs significantly in range and in relative biological effectiveness. To measure each type of radiation

in sediment, we have used luminescence dosimetry using Al₂O₃:C dosimeters. We have tested different forms of aluminum oxide dosimeters, including chips, grains, and Luxel sheets, each of which can be made alpha-resistant or not. When radiation comes into contact with the dosimeters, it ionizes atoms in the dosimeter, which creates freed electrons. A fraction of these freed electrons become trapped in crystal defects in the material. When the dosimeter is illuminated, the optical stimulation releases the trapped charge, which combines with charge of the opposite sign. In this process, light is emitted, which is called optically stimulated luminescence (OSL). The OSL signal observed is proportional to the amount of radiation dose absorbed by the dosimeter. We convert OSL signal to dose in Gy by calibrating the dosimeter with a "dose response" curve obtained by exposing the dosimeter with known doses, and observing the luminescence. Statistical information on radiation distribution as well as results from mineral analysis will be used to calculate survival probabilities.

GP38

Using Geostatistics to Characterize the Heterogeneity of a Karst Aquifer, Jonathan Mitchell Prevatte, East Carolina University, Greenville, NC

Groundwater aquifers are often characterized by monitoring water level changes in an observation well during a constant rate pump test over approximately 24 hours. However, these well tests provide only point specific data and can be costly to perform. Point specific data are often used to parameterize a numerical model, assuming a homogeneous and isotropic aquifer. These assumptions are often not found in nature and can lead to inaccurate model output and poor aquifer management. The study will focus on multiple wells in the Castle Hayne Aquifer, an Eocene aged karst aquifer in the coastal plain of North Carolina. Geostatistics will be used to characterize the flow dynamics from borehole data obtained from the North Carolina Department of Environmental and Natural Resources (NCDENR) and other sources. Characterizing the heterogeneous characteristics of this karst aquifer will allow for better understanding and modeling of coastal groundwater flow and associated dynamics.

GP39

Source Rock Characterization of the Point Pleasant Formation, in Washington County, Ohio, *Scott A Brinkley, East Carolina University, Greenville, NC*

The advent of horizontal drilling and hydraulic fracturing has enabled hydrocarbon extraction from organic-rich shales globally and in Appalachia, specifically. Although an abundance of applicable data exists for the Marcellus Shale across Appalachia, the geological constraints of hydrocarbon production for the Point Pleasant Formation within the Appalachian Basin are not well-known. This study focuses on the characterization of the source rock of a production well in the Point Pleasant Formation in Washington County, Ohio, to extrapolate its hydrocarbon potential across the basin. This study includes the description of well logs, geochemical (carbon percentages and indices, and XRD) and structural analysis of the recovered core, alkane chromatography, and existing stratigraphy. By broadening the understanding of the geological constraints of the hydrocarbon potential in the Point Pleasant Formation, (1) state and local governments can prepare land zoning and waste water disposal, (2) landowners will be better informed of property values relating to mineral rights and the Point Pleasant Formation, and (3) industry can make more precise land purchases and maximize hydrocarbon production per well.

GP40

Seasonal Nitrogen Dynamics of Packaged Wastewater Treatment Plants in Coastal North Carolina, *Robert Nicholas Maboney, Eban Bean (mentor), Department of Engineering, East Carolina University, Mike O'Driscoll (mentor), Department of Geological Sciences, East Carolina University, Greenville, NC*

Nutrient enrichment problems have been well documented in many of the waterways surrounding North Carolina's coast. These waters are particularly sensitive to nitrogen, which is a common constituent in wastewater. Packaged treatment plants (PTPs) are often used for wastewater treatment in coastal settings. Package treatment plants are pre-manufactured wastewater treatment facilities that are designed to treat and dispose of 7.5—1,892.7 m³/d (0.002—0.5 MGD) wastewater onsite for small communities, commercial developments, and individual properties. These systems recycle the treated wastewater effluent back into the environment by both surface and subsurface discharge. While many studies have been conducted on municipal wastewater treatment plants and septic tank systems, relatively few have focused on PTPs. Of these studies, there is little information documenting the nitrogen contributions to the groundwater system. This study aims to assess the effectiveness of these treatment systems in a coastal environment.

Seven PTPs located on Bogue Banks, on the North Carolina coast, were monitored for one year. Influent and effluent samples were collected

monthly and analyzed for different species of nitrogen (NO₃-, NO₂-, and NH₄⁺). These systems produced variable results throughout the course of the study. All systems were capable of reducing total nitrogen concentrations to levels determined safe for the environment. These results, however, were inconsistent from month to month with many instances where the systems failed to achieve proper nutrient

GP41

Seismic Stratigraphy of the Amazon Basin: Cenozoic Landscape Evolution of the Central Brazilian Amazon, *Sage Wagner, East Carolina University, Greenville, NC*

This study aims to develop an over-arching stratigraphic framework of the central Brazilian Amazon (CBA) during the Cenozoic. This time-frame holds key information regarding establishment of the Amazon River drainage system and evolution of the modern rain-forest. Despite extensive hydrocarbon exploration undertaken in the Amazon Basin and geological studies in the westernmost and easternmost regions, little is known about the non-petroleum-bearing shallow Cenozoic strata. In the CBA, Cenozoic outcrops are rare and chronologies are not well established, therefore geophysical subsurface analysis is essential. We propose to perform a basin analysis assessment through integration of high-resolution seismic reflection profiles, gravimetric surveys, and geophysical borehole logs to define the stratigraphic architecture and tectonics deformation on two sedimentary basins within the CBA. The Solimões and Amazonas basins are separated by the Purus Arch, a structural feature that has previously been posited as a topographic high that played a role in the development of Amazon trans-continental drainage. The age of trans-continental drainage, that is the age at which the Amazon effectively transmitted water and sediment from the Andes to the Atlantic Ocean, is highly debated in the literature. We hypothesize that the first order-control of this trans-continental drainage was the breaching of the Purus Arch during the late Miocene, not the uplift of the Andes. This study will also facilitate continental stratigraphic drilling along the flank of the Purus Arch, in order to recover complete Cenozoic sedimentary sequences for future geochronological studies.

GP42

Characterizing the Surficial Aquifer of a Barrier Island, Bogue Banks, North Carolina, *James Edwin Owers, East Carolina University, Greenville, NC*

Sea level change can affect groundwater flow by altering characteristics of the vadose zone and freshwater lens. This change in sea level may cause the water table to rise, increasing the frequency of flood events. This is problematic due to the presence of infrastructure, such as onsite

wastewater treatment systems (OWTS). State regulations insist that these systems must be placed above the water table, but less than one meter below the land surface. This means that as the water table rises, more systems will be inundated and less land will be acceptable for new OWTS. A sea level rise as little as 20 cm causes dramatic changes in the groundwater system and on the ecology of barrier islands. Previous studies have been performed on undeveloped barrier islands, but this study will attempt to discover how changes in sea level affect developed barrier islands.

Shallow monitoring wells (0.6 to 4.6 meters in depth) and numerical modelling will characterize the surficial aquifer of Bogue Banks, a developed barrier island in North Carolina. Bogue Banks has approximately 4,000 permanent residents, with a seasonal population of up to 40,000 residents. Forty shallow monitoring wells will be installed throughout Bogue Banks. Water table elevation data will be collected using water level loggers over a six month period and used to characterize the water table in the shallow aquifer. These data will then be used to model the impact of sea level rise on the water table and how the resulting groundwater inundation becomes a hazard to society.

GP43

Holocene Paleoclimatic Evolution of the East Asian Monsoon on the Inner Sunda Shelf, Malaysia, Cameron J. Whitley, Eduardo Leorri, Stephen J. Culver, David J. Mallinson, Department of Geology, East Carolina University, Greenville, NC

Climate control on coastal systems' productivity might have great implications in areas such as South East Asia, where most of its population lives in the coastal fringe and rely on agriculture and fisheries as major economic drivers. In that sense, understanding the long term evolution of the east Asian monsoon (EAM) and its control upon precipitation, wind patterns, continental runoff, nutrient transport, and sea circulation is essential to forecast potential impacts in the economy of this region under the current and future climatic scenarios. In order to obtain sediment cores with large sedimentation rates that allow high resolution studies of climatic changes during the Holocene seven cores were selected from valleys incised during past sea-level falls, currently located on the Sunda shelf. Three ~3 m mud-dominated, sediment cores (D37, D45, and D83) were collected from the inner shallow Sunda shelf north of Bintulu, Sarawak, Malaysia. The remaining four ~3 m gravity cores (TER-I3-GC3, TER-I3-GC4, TER-I4-GC5, and TER-I4-GC7) were collected from fluvial paleochannels on the Sunda Shelf off Kuala Terengganu, Peninsular Malaysia. Oxygen and carbon stable isotopic analysis of the benthic foraminifera (*Cavarotalia annectens*) collected from cores D45, TER-I3-GC3, TER-I3-GC4, TER-I4-GC5, and TER-I4-GC7 will be compared to the oxygen and carbon stable isotopic analysis of the planktonic foraminifera (*Globigerinoides ruber*) of the same cores to reconstruct the Holocene paleoclimate. Magnetic susceptibility of bulk sediment (BMS) results from cores D37 and D83

will be compared to the BMS results previously collected from cores TER-I3-GC3, TER-I3-GC4, TER-I4-GC5, and TER-I4-GC7. The BMS data comparison will reflect the differences in detrital input on opposite sides of the Sunda Shelf and will be used to infer changes in the depositional environment through time. Studying the Holocene sediment in-fill of incised valleys will provide a better understanding of the EAM during the last ca. 9000 years.

GP44

Delineating Wastewater Contaminant Plumes from On-Site Wastewater Systems using Electromagnetic Induction in the North Carolina Coastal Plain, Adam Trevisan¹, Michael O'Driscoll¹, Terri Woods¹, Charles Humphrey², Eban Bean^{3,1}, Department of Geological Sciences, East Carolina University, ² Environmental Health Sciences Program, Department of Health Education and Promotion, East Carolina University, ³ Department of Engineering, East Carolina University, Greenville, NC

Excess nitrogen and fecal bacteria loading have contributed to eutrophication and impairment of shell fisheries along North Carolina's coast. Prior research has shown that malfunctioning on-site wastewater systems (OWS) may contribute these pollutants, yet most OWS are not monitored after installation due to the costs and invasiveness of traditional monitoring techniques. We explored the use of electromagnetic induction (EMI), an inexpensive and non-invasive technique for measuring electrical conductivity (EC) in the surficial aquifer to ~10ft deep, to delineate wastewater-impacted groundwater from OWS in coastal North Carolina. Wastewater inputs typically increase groundwater EC relative to background levels. Therefore, EMI could provide a means to efficiently monitor these systems. Multi-frequency domain EMI surveys were conducted to evaluate the EC of sandy surficial aquifers at three non-residential OWS in coastal North Carolina (Pitt and Craven Counties) during winter and summer periods. To validate these surveys, water samples from the OWS drainfields were analyzed for specific conductivity, nitrate, ammonium, total Kieldahl nitrogen, fecal coliform bacteria, and chloride concentrations. Additionally, capacitively-coupled resistivity surveys (CCR) were conducted, and ground penetrating radar (GPR) assisted in delineating OWS components. The results indicated that EMI can help screen locations where wastewater-impacted groundwater EC exceeds that of background groundwater. Effectiveness depends on numerous variables (depth to the water table, soil type, magnitude of groundwater inputs, and background EC). Future research should assess EMI for monitoring residential OWS, for monitoring OWS in other, less sandy Coastal Plain soil types, and for better understanding EMI sensitivity to water table fluctuations.

GP45

Estimation of Out-Of-Field Dose using Whole Body Computational Phantoms, Christopher Pelletier, East Carolina University, Greenville, NC

Purpose: Epidemiological study of second cancer risk for cancer survivors often requires the dose to normal tissues located outside the anatomy covered by radiological imaging, which is usually limited to tumor and organs at risk. We have investigated the feasibility of using whole body computational human phantoms for estimating out-of-field organ doses for patients treated by Intensity Modulated Radiation Therapy (IMRT). **Methods:** Identical 7-field IMRT prostate plans were performed using X-ray Voxel Monte Carlo (XVMC), a radiotherapy-specific Monte Carlo transport code, on the computed tomography (CT) images of five patients, as well as adult male hybrid computational phantom with the equivalent body size. Dose to the liver, right lung, and left lung were calculated and compared.

Results: Considerable differences are seen between the doses calculated by XVMC for the patient CT and the hybrid phantom. One major contributing factor is the treatment method, deep inspiration breath hold (DIBH), used for these patients. This leads to significant differences in the organ position relative to the treatment isocenter. The transverse distances from the treatment isocenter to the inferior border of the liver, left lung, and right lung are considerably different for the patient CT compared to the hybrid phantom. When corrected for the distance, the mean doses calculated using the hybrid phantom are within 28% of those calculated using the patient CT.

Conclusion: This study showed that mean dose to the organs located in the missing CT coverage can be reconstructed by using whole body computational human phantoms within reasonable dosimetric uncertainty, however appropriate corrections may be necessary if the patient is treated with a technique that will significantly deform the size or location of the organs relative to the hybrid phantom.

GP46

Markov Chains, Random Walks, and Card Shuffling, Nolan Lewis Outlaw, East Carolina University, Greenville, NC

There are many forms of card shuffling, but perhaps the most common is the riffle shuffle. This is the shuffle used by typical card players, as well as in most casinos. Riffle shuffling is an activity that can be modeled very well by mathematical techniques and computer programs. It looks easy to simulate, but the number of shuffles needed is enormous. By using computer simulations, the necessary number of shuffles needed in order for the deck to reach random can be determined. The purpose of this research is to explore the mathematical methods used in modeling card shuffling in order to determine the "cut-off" for a given deck of cards. To this end, some techniques used include the Markov chains and random walks. Markov chains model sequences of events that can take on a given number of outcomes with probabilities assigned to each. For

card shuffling, the Markov chains are ergodic. One quality of an ergodic Markov chain is that after a given number of transitions, the chain will reach a stationary state so that any subsequent moves result in the same probability distribution on all states. Random walks are used in the total variation calculation. A random walk is a method used to model the movements of an object through a series of random steps.

There are many reasons why it is desirable to have a random deck of cards for any multi-person card game, and chief among them is to ensure that everyone has a fair opportunity throughout the course of the game. Similarly, casinos have an immense financial interest in guaranteeing that the decks of cards they use are random when the games begin. In order to test randomness, total variation is used. By using total variation, it is possible to compare the "distance" of a shuffled deck of cards from a random deck of cards. By using a random number generator, a random permutation of a deck of cards is generated. This random deck is then used to determine the total variation of a shuffled deck from random after a given number of shuffles. By running multiple trials using computer programs, the cut-off phenomenon is observed. The cut-off phenomenon is a steep drop in total variation of a random deck from random. The occurrence of this cut-off suggests that a sufficient number of shuffles have occurred and the deck is random.

GP47

Origin and geochemical evolution of localized, high-ferrous-iron zones in the Upper Castle Hayne Aquifer, Beaufort County, North Carolina, Akland, Mark Jonathan, Woods, Terri L., and Mauger, Richard L. Geological Sciences, East Carolina University, Greenville, NC

The Tertiary Upper Castle Hayne Aquifer (UCHA) is one of the most productive and most extensively developed aquifers in the North Carolina Coastal Plain; however, localized zones containing high, dissolved-iron concentrations ($>0.3 \text{ mg/L}$) have been measured near the recharge area. Although iron-rich groundwater is an expensive water quality and infrastructure problem affecting municipal water suppliers in eastern North Carolina, the evolution of high-iron zones in the UCHA is poorly understood. This preliminary study integrates mineral geochemistry, mineralogy, sedimentology, and geochemical groundwater modeling techniques to identify potential sources and sinks of dissolved iron near Washington, NC in Beaufort County. Three reddish orange sediment samples, extracted from around 13, 17, and 21 feet below the ground surface, have the highest measured iron concentrations (approximately 13.7% for each sample). Several additional anomalies occur within the aforementioned depth range including both the minimum and maximum pH values (4.9 and 8.1, respectively), the largest increase in cation exchange capacity (from 2.3 to 124.6 meq/100 cm³), and the highest concentrations of mud-sized grains (87.1%), fluorine (0.69%), magnesium (1.6%), aluminum (15.2%), phosphorous (II.1%), potassium (2.5%), manganese (0.16%), copper (0.7 mg/dm³), and zinc (4.1 mg/dm³). X-ray fluorescence and grain size data show that major iron concentrations can be correlated with large proportions of mud-sized particles, elevated

cation exchange capacities, and relatively high manganese concentrations. Initial results of magnetic susceptibility, x-ray diffraction, and optical microscopy analyses indicate that iron-bearing minerals such as goethite, hematite, magnetite, ilmenite, pyrite, glauconite, nontronite, and jacobsite may be important sources of dissolved iron in the coastal plain overburden. Geochemical groundwater modeling indicates that cation exchange reactions between ferrous iron and smectite group minerals may substantially deplete dissolved iron once groundwater enters the UCHA. Future biogeochemical studies will be necessary to determine the degree to which microbial processes affect the formation and distribution of high-iron microsites.

GP48

The Role of the Mid-latitude Upper Level Trough in Extra-Tropical Transitioning Hurricanes, *Nicholas T Luchetti, Department of Geography, Planning, and Environment, East Carolina University, Greenville, NC*

Nine notable Western European cyclones are studied to better understand the role the mid-latitude upper level trough (MULT) in the extra-tropical transition (ET) process of tropical cyclones (TCs). The MULT is represented on a weather map as a trough (or “dip”) in the jet stream. ET occurs when a symmetrical warm-core vortex (e.g., a hurricane) transforms into an asymmetrical cold-core vortex (e.g., a nor'easter) characterized by fronts and different air masses. By definition, TCs, which form in the tropical oceans, tend to rapidly decay as they migrate northward into the mid-latitudes due to cooler sea surface temperatures and stronger upper-level wind shear. However, decaying TCs can also re-intensify during the interaction with a MULT. Care is taken in distinguishing between “good” troughs (those that re-intensify TCs post-ET) and “bad” troughs (those that aid in dissipation of TCs). While ET systems are no longer classified as hurricanes, they can still pack a punch and surprise forecasters. Western Europe is an area frequently impacted by post-ET cyclones, noted for their strong winds, heavy rain, and even snow. After an examination of various atmospheric parameters, it is found that upper-level divergence is significantly correlated with the intensification of ET cyclones.

GP49

Understanding the Relationship between the Taghanic Unconformity and Marcellus Shale Production in Doddridge and Richie Counties, West Virginia., *Emily Nicole Adams, East Carolina University, Greenville, NC*

The interplay between crustal thickening, deformation and compressional tectonics resulted in the development of a foreland basin during the Acadian orogeny. This dynamic event led to the Acadian Delta complex, which in turn initiated the deposition of organic particles and rock material. These particles and materials are recognized as a unit of marine sedimentary rocks, the Marcellus shale. Deposition was followed by period

of eustatic sea-level rise that resulted in foreland basin growth, which was terminated by the Taghanic unconformity. The Taghanic unconformity was created from a reactivation of a peripheral bulge during the Acadian orogeny. Interactions between the Taghanic unconformity and orogenic events removed most of the upper Marcellus unit. Presently, the Marcellus shale resides in thinning layers across West Virginia and is cut by the Taghanic unconformity in the northwestern part of the state.

The goal of this project is to identify hydrocarbon production differences as a result of the Taghanic unconformity on the Marcellus shale in Doddridge county as compared to production in Ritchie county. This study includes the examination of gamma ray log signatures of the Middle-Upper Devonian Marcellus shale as a proxy for unit total organic carbon content. This data will be derived from log images obtained by the West Virginia Geological and Economic Survey. Image gamma ray logs will then be correlated to form comparisons between log-determined productivity of Doddridge and Richie counties. Mapping of production intervals of the counties will also be used as a tool to define thickness of the Marcellus shale in the two counties in relation to the Taghanic unconformity.

GP50

Characterization of miR319-Regulated TCPs in Maize Inflorescence Development, *Katherine Ann Novitzky, Beth Thompson, Department of Biology, East Carolina University, Greenville, NC*

Maize produces two inflorescences, the tassel and the ear, that are essential for reproduction. Both inflorescences arise from similar inflorescence primordia and are patterned largely by the same developmental regulators. Some of these inflorescence regulators are also responsible for leaf development and are critical for establishing plant architectures. TEOSINTEBRANCHED1/CYCLODIA/PCF (TCPs) are a unique class of plant-specific transcriptions factors that control proliferation and differentiation to establish plant architecture. A subset of TCPs (CIN-TCP) are regulated by microRNA (miRNA) miR319 and are required for petal and leaf development in multiple plant species. miRNAs are short non-coding RNAs that direct cleavage of target mRNAs. The maize fuzzy tassel (fzt) mutant is a hypomorphic allele of dicer-like1, which encodes a key enzyme required for miRNA biogenesis. fzt mutants have a broad range of vegetative and reproductive defects including reduced plant and leaf size, meristem indeterminacy in the inflorescences, and sex determination defects. fzt has reduced levels of some miRNAs, including miR319. Because miR319 is significantly reduced in fzt mutants and TCP genes have well-known roles in plant development, we hypothesized that misexpression of TCP genes might contribute to the fzt phenotype. RNA-seq analysis of tassel primordia indicated that CIN-like TCPs were expressed at similar levels in fzt mutants and normal siblings. RNA-seq at the whole tissue level cannot detect changes in expression domain or timing, however, so we are also examining the spatiotemporal expression of miR319-targeted TCPs in shoot apices and tassel primordia using RNA in situ hybridization. Preliminary data suggests that at least two TCP genes are expressed in all inflorescence meristems and floral primordia. We are currently confirming these results and also examining expression in fzt mutant inflorescences.

GP51

Connecting Modern Back-BARRIER ISLAND Deposits to Storm Records using Meteorological Data from the Outer Banks, NC, *Nicholas Joseph Kelly, Dr. J.P. Walsh, Dr. D. Reide Corbett, East Carolina University, Greenville, NC*

North Carolina's Outer Banks, a 320 km barrier island chain stretching from Virginia Beach, VA, to Cape Lookout, NC, is a popular tourist location and key to the state's economy. The islands separate the Albemarle-Pamlico estuarine system from the Atlantic Ocean. The width of the sound can be as great as 50 km at some points due to the islands' varying distance from the mainland. This in turn creates a large fetch that makes the sound-side shorelines of the islands very susceptible to shoreline change and rapid morphological change. Examining storm records using meteorological data such as wind speed, wave height and tide gauge stations we can begin to connect storms to certain deposits within the modern back-barrier islands. Using this data, we can extrapolate the frequency of storms that have affected the islands and try and delineate any trends in sediment movement and supply that may exist. With the increasing number of high energy storms occurring off the United States' east coast and continual growth of coastal populations, understanding the island system's morphology in areas of rapid sediment accumulation is key in determining potential impacts on the economy and livelihood of the communities located on it.

GP52

Back barrier erosion and hydrodynamic forces define deposition and accretion potential for Hatteras Flats, Rodanthe, NC, *Christopher J Cornette, East Carolina University, Greenville, NC*

The NC Outer Banks, a chain of barrier islands protecting a large estuarine system, are a significant ecologic and geologic environment. The Outer Banks are regressive barrier islands in a shoreline transgressive sequence due to rising sea level, sediment supply, and human impacts. Barrier island regression on the Outer Banks is historically driven by overwash. With human development limiting overwash as a mechanism for barrier island migration and back barrier sediment supply, erosion of the back barrier environments has increased. Lateral erosion has historically been measured on the scale of feet to tens of feet per year in the Pamlico Sound. This erosion may supply the back-barrier basin with a significant amount of sediment, filling newly created accommodation space attributed to rising sea level. This back barrier environment of the Outer Banks is referred to as Hatteras Flats. The Flats are large, shallow, sand flats in Pamlico Sound that were created 1,000 B.P. and are remnants of historic flood tidal deltas. However, little information is available on the modern sediment dynamics and drivers for morphological change. This study will use bathymetric surveys, sediment grab samples, shoreline change analysis, and in situ observations of hydrodynamics to define regional sediment processes. I hypothesize that shoreline erosion of the back barrier provides

a sediment source to Hatteras Flats, allowing basinward accretion. Results will increase our understanding of the link between island morphologic change and back barrier sediment dynamics and will have implications for predicting future barrier island evolution.

GP53

Effects of hydroperiod and predator phenology on the cost of induced defenses in tadpoles, *Alyssa Lynn D'Alessandro, Heather Vance-Chalcraft, Department of Biology, East Carolina University, Center for Biodiversity, East Carolina University, Greenville, NC*

Many prey species display defensive phenotypes, called induced defenses, in response to predators. Evidence suggests that most species of tadpoles exhibit specific morphological, behavioral, and physiological defenses in response to a specific predator. Since effectiveness and costs associated with induced defenses may vary with development, factors altering the development of tadpoles have the potential to impact these defenses. Changes in climate have the potential to alter the timing of life history events, community structure, and even the likelihood of certain habitats persisting. Current climate change models predict that temperatures will increase and precipitation will become more variable in eastern North Carolina. These changes are likely to decrease the length of time temporary ponds hold water. In addition, climate change may impact the timing of life events in pond predators. For example, with a longer warm season, dragonfly nymphs may emerge in the fall instead of remaining in a pond throughout winter. We used a mesocosm experiment to test whether the presence and costs of induced defenses in Cope's gray tree frog (*Hyla chrysoscelis*) tadpoles are influenced by i) shortened hydroperiod, ii) the presence of overwintered dragonfly nymphs, or iii) the combination of hydroperiod and overwintered dragonflies. Preliminary results suggest that survivorship is significantly impacted by hydroperiod, with higher survivorship in short hydroperiod treatments. The presence of predators decreases the effects of hydroperiod on tadpole larval period and mass at metamorphosis. Even though *Anax* is known to be a particularly voracious predator, it did not have a significantly different effect on tadpoles than *Belostoma*, another common pond predator. Thus, it is possible that the predicted removal of *Anax* from the system over winter will not have a great effect on tadpoles beyond reducing the overall abundance of predators. We are in the process of comparing the morphology of tadpoles in different treatments using geometric morphometrics. Both temporary ponds and amphibians are hypothesized to be very sensitive to climate change, which is only predicted to increase in the future. By increasing our understanding of these delicate communities, we will increase our likelihood of being able to manage them in the future and prevent the complete extinction of these important organisms and habitats.

Evaluating sedimentation rates in tidal marshes across a tidal range gradient along the southeastern United States, Luke D Stevens, Department of Geological Sciences, East Carolina University, Greenville, NC

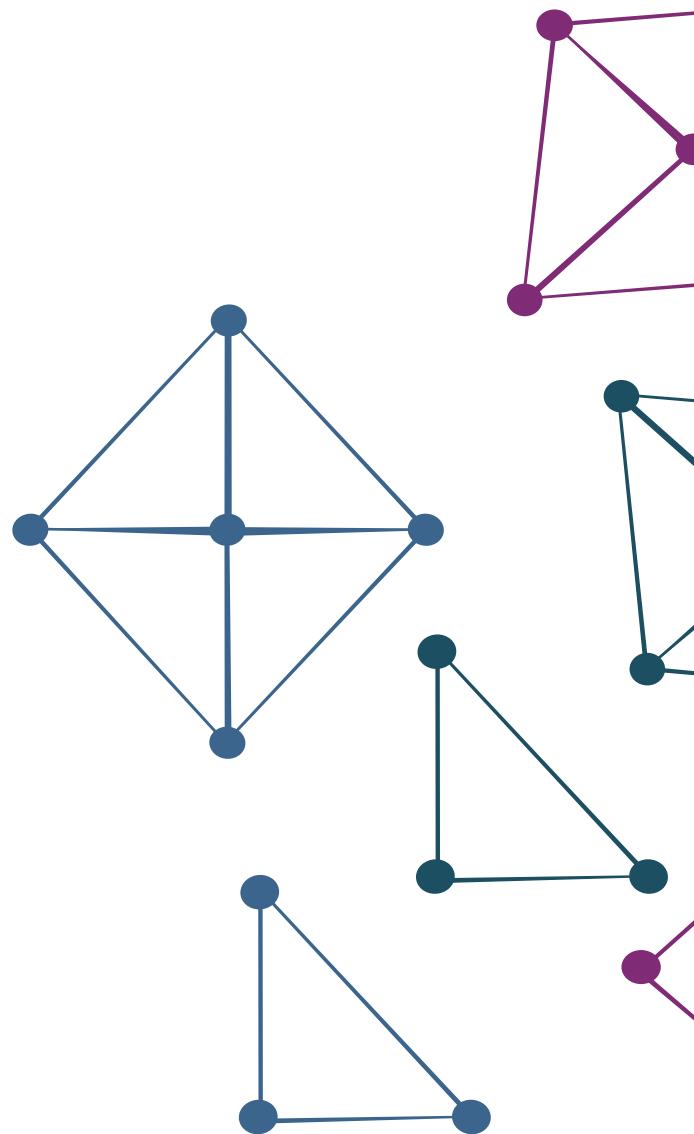
From Maine to Florida, the east coast of the United States is home to an invaluable landscape of salt marshes. These critical coastal ecosystems stand at the forefront of climate change science, positioned as transition zones between salty and brackish coastal waters and the terrestrial environments of the coastal plain.

Marshes are of broad ecological significance, serving as important primary production zones, marine life nurseries and natural filters, absorbing and regulating nutrient exchange between terrestrial and marine environments. They are also of great economic importance, functioning as flood controls throughout the coast.

Marshes grow, shrink and migrate in response to sedimentation processes and to changes in sea level. The factors influencing sedimentation include influx of sediment from rivers and streams, sediment supply from storm events, in situ sediment production, and oceanic influx via tides. Rising sea level along the east coast of the U.S. is increasing the tidal frame, leading to shrinking or the landward migration of marshes. Rates of sedimentation vary between different regions of a single marsh, between individual marshes, and from one system of marshes to another. In order to protect and preserve the salt marshes of the eastern U.S., a better understanding of this variability is needed.

This study will focus on three eastern U.S. salt marsh systems, the Outer Banks of North Carolina, near Georgetown in South Carolina, and near Savannah, Georgia. These systems vary significantly in tidal range, allowing for examination of the relationship between tidal range and sediment accumulation rate. Real time kinematic (RTK) elevation measurements, vegetal transition boundaries, and Russian core sediment samples will be collected to evaluate relationships between sedimentation rates and marsh characteristics. This study will help to provide the understanding needed for the preservation and responsible use of these vital marshes.

from a given percentage of the original signal data. The experiments proceed by first partitioning the data into packets. Then the Haar Transform is applied to each packet and only the largest coefficients, for example the largest 10%, are kept. The resulting packets are then reconstructed into approximations of the original signal. Assessing how well a reconstruction approximates the original signal depends on the particular application and may be either quantitative or qualitative; for example, one could analyze the mean-squared error or visually compare graphical representations. The goal of the project is to experimentally determine what packet size gives the “best” approximation for different types of digital signals.



Digital Signal Processing using the Discrete Haar Wavelet Transform, Kenneth Charles Chilcoat, Dr. Gail Ratcliff, Professor, Department of Mathematics, East Carolina University, Greenville, NC

The presentation will highlight the results of an ongoing experimental digital signal processing research project. Whether for data compression or due to a loss of data, the process of reconstructing an approximation to a digital signal from only a portion of the original signal is a common problem both practically and theoretically. The purpose of this project is to experimentally assess the reconstruction of a variety of known input signal types

GP56

Effects of Hypoxia on Age 0 Striped Bass and River Herring,
*Shelby White, Ryan Mackenzie, Roger Rulifson, Eban Bean, East Carolina University,
Greenville, NC*

This study will use field observations to monitor hypoxic conditions (<2 mg O₂/L) developing during summer and fall, while conducting in situ experiments to determine how Ago 0 striped bass (*Morone saxatilis*) and river herring (*Alosa* sp.) respond to hypoxia. These species were chosen based on recreational, commercial, and cultural importance; importance to the food web at Age 0; and use of Strategic Habitat Areas (SHAs) in Albemarle Sound as primary nursery habitat. Our concern is to find whether these young *Morone saxatilis* and *Alosa* sp. can reside in Albemarle watersheds for extended periods under hypoxic conditions and display normal growth and recruitment to forming year classes or whether these hypoxic zones, including large areas of SHAs, are excluded as nursery habitat because hypoxic waters are detrimental to their ability to survive and grow. Hypoxia can be identified by the trace manganese in ambient waters. Manganese is released from the sediment during changes in water chemistry via reduction of insoluble Mn (III/IV) within sediments forming soluble Mn (II). If fish use hypoxic zones as refuge, Mn should appear on their otoliths. Two sampling platforms will be placed in Albemarle Sound tributaries: Perquimans River (hypoxic) and Pasquotank River (normoxic). Platforms will have two automated water samplers collecting samples for analyses from upper (~1m) and lower (~3m) portions of the water column at 12-hour intervals. Water quality sondes will measure water quality parameters (every 15 minutes) and will be deployed within upper and lower water columns to determine the vertical structure, stability, and duration of hypoxia. Cages containing either Age 0 striped bass or river herring will be suspended below the platform in upper and lower water columns. Fish will be forced to reside under the ambient conditions, determining long-term hypoxia effects. Vertically elongated (3m deep) control nets will also hang from the platform, allowing fish to select their position in the water column. We hypothesize the control fish will choose non-hypoxic waters during hypoxic events. Fish will be measured for growth changes related to the ambient conditions. Otoliths will be extracted and examined for Mn traces. We hypothesize that manganese will only occur in the bottom dwelling fish, exposed to extended hypoxic conditions. Possible causes of hypoxia will be identified through water chemistry, isotopic analyses, and GIS mapping layers.

GP57

DIRECT AND INDIRECT EFFECTS OF SALINITY ON AQUATIC METABOLISM IN A NORTH CAROLINA COASTAL WETLAND,
Tori Goebrig and Eva Gallardo, Department of Biology, East Carolina University, Greenville, NC

Global climate and local land use change are causing increases of high salinity waters to former freshwater wetlands. Given that coastal wetlands are large carbon sinks, it is important to understand how increased salinity could affect carbon export from coastal wetlands. Research in the Timberlake Observatory for Wetland Restoration (TOWeR) has shown that increased salinity can decrease the amount of dissolved organic carbon (DOC) potentially through salt-induced flocculation. The exact mechanism of this decline in DOC is unclear, as is the fate of this missing carbon. Reductions in DOC may affect other biogeochemical processes. While it is well known that salinity directly hinders plant productivity, the indirect effects of salinity on aquatic metabolism have not received as much attention. Salinity could indirectly affect metabolism by increasing light penetration through increased flocculation of dissolved organic matter. Here we examined direct and indirect effects of salinity on aquatic metabolism in a coastal wetland. We estimated aquatic metabolism using three years of continuous dissolved oxygen measurements and conducted laboratory assays to estimate flocculation and changes in light attenuation. Analyses are still underway, but preliminary results show that gross primary production is low (0.84 g O₂ m⁻² d) compared to respiration (1.91 g O₂ m⁻² d). We did not see large effects of salinity on GPP or ER, but salinity was relatively low during the study period. Laboratory assays showed that flocculation increased even with low levels of salinity. Our results suggest that even low levels of increased salinity could indirectly alter aquatic metabolism through flocculation by increasing light availability.

GP58

Synthesis, Structures and Photophysical Properties of Phosphorescent Cyclometalated Platinum Complexes.,
Robert Mroz[†], Dileep A. K. Vezzu[†], Jeffrey Carroll[‡], Deepak Ravindranathan[†], Rachel Terrell[‡], Brian Wallace[†], Robert D. Pike[‡], and Shouquan Huo[†]

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Phosphorescent materials based on cyclometalated platinum complexes have recently attracted a great deal of attention because of their potential in chemical, biological and optoelectronic applications, specifically as emitters in OLED (organic light-emitting diode) devices. A series of new C^NN-coordinated platinum complexes bearing either an ancillary phenylacetylidyne or phenyl ligand were synthesized. The structures of four

complexes with a phenyl ancillary ligand were determined by single-crystal X-ray diffraction. The photophysics of these platinum complexes were investigated, which includes absorption and emission spectra, lifetime of excited states, and solvent effect. In this presentation, we will report these results and discuss the difference in emission efficiency between phenyl- and phenylacetylid- substituted complexes.

GP59

Parenting Diabetic Kids, *Amelia R. Muse, East Carolina University; Rola O. Aamar, Texas Tech University; Jason B. Whiting, Texas Tech University; Angela L. Lamson, East Carolina University, Greenville, NC*

Parents with children with diabetes are often responsible for their children's 24/7 intense medical regimen. Little is known about the taken-for-granted reality of parents caring for their child with diabetes. This phenomenological study explored how parents describe their experience parenting a child with diabetes, how they manage the demands of the medical regimen, and how parents make meaning of their experiences. The author coded significant statements of blog posts and comments from an online community about parenting children with diabetes. Codes were grouped by meaning to create seven themes. Parents expressed resilience in their challenges in parenting and managing the medical regimen. They also experienced guilt and helplessness from witnessing their children's struggles, but viewed their children as brave and strong. Diabetes may be as much of an emotional struggle for parents as it is a physical struggle for their children. Parents and their diabetic children could benefit from support that goes beyond balancing the demands of the medical regimen and extends to their emotional and relational health.

GP60

Spatial Distribution of Plow Zone Ceramics at Town Creek, *Marianne McGinn, East Carolina University, Greenville, NC*

Ceramics are used in archaeological research to determine the spatial and temporal distributions of people in the past. Ceramics were used for cooking and serving food for households. Ceramics changed over time, so they can be used to date different areas. My research examines the spatial distribution of several types of temporally significant types of ceramics at Town Creek, an archaeological site in North Carolina's Piedmont, to explore the usage of the site through time. This site has been occupied since 10,000 years ago. Ceramics first occur at the start of the Woodland period, about 2000 years ago. This research will

look at the distribution of the different ceramic groupings to determine the different time periods that the site was in use and the areas of the site those people used. This will allow for a better understanding of site function and site usage over time.

GP61

An Exploration of Collegiate Outdoor Recreation Professionals' Personality Traits and Job Task Affect, *Brittany Ruthann Turnis, East Carolina University, Greenville, NC*

Pursuing a career in the outdoor recreation field may have resulted because of one's exposure to the outdoor culture; however, social scientists have also hypothesized that personality has an influence on career and work setting choices (Holland, 1959; 1997). According to Holland's RIASEC model (1997) personality types have been shown to thrive in corresponding work environments. Work environments also foster aptitudes and abilities common to characteristics of identified personality types. Using theoretical frameworks from psychology, the researcher is collecting data to investigate the traits present in the full time collegiate outdoor recreation employees. The researcher is interested in discovering if there is a correlation between personality type and an individual's affect towards characteristics of their work environment. In addition to Holland's model, the Five Factor Model (FFM; McCrae & Costa, 1987) has been utilized in assessing occupational psychology. While a few researchers have explored personality as a contributor to outdoor leadership qualities in a range of settings (Buell, 1983; Riggins, 1985), personality has yet to be studied in collegiate outdoor professionals. Using the Five Factor Model of personality (McCrae & Costa, 1987; McCrae & John, 1992) this study seeks to (1) investigate personality traits of collegiate outdoor recreation professionals, and (2) examine the relationship between professional outdoor recreation staff personality and their affect towards their work responsibilities. This study has implications for individuals involved not only in campus recreation, but throughout the wider outdoor recreation community as well. By knowing the personalities of one's staff, as well as the traits of potential candidates, administrators in recreation departments can better assign tasks that, according to theory, employees will enjoy. Hiring qualified professionals is crucial to the successful functioning of a business or department; thus, knowing the personalities of the people employed at an organization has the potential to offer benefits that may enhance a positive workplace experience. Data collection for this study began in late 2014 with a target sample of 244 professional members of the Association for Outdoor Recreation and Education (AORE). To date, data have been collected from 91 respondents. Early findings will be presented.

GP62

Examining the Adoption of National School Lunch Program Amendments in North Carolina, *Olivia Rachel Whitt, East Carolina University, Greenville, NC*

Childhood obesity is a growing epidemic in the United States with more than one third of all children currently being identified as overweight or obese. To address this epidemic the Federal Government on July 28th 2013, amended the National School Lunch Program policy with more stringent health-focused requirements. Little research has been conducted to assess the adoption and implementation of these policy changes. We examined Student Wellness Policies in 12 randomly selected metro and nonmetro counties in North Carolina, using the standardized Bridging the Gap Coding Tool to evaluate the degree of policy adoption. Our analysis will highlight policy-related disparities in North Carolina's metro and nonmetro school districts. These disparities can be addressed through further study of policy adoption and implementation in NC Schools.

GP63

Knowledge of water quality among different cultural groups: Insights towards improved citizen science projects and education campaigns, *M. Chad Smith and Roger A. Rulifson, Coastal Resources Management Program, Institute of Coastal Science and Policy, East Carolina University, Greenville, NC*

Education is often times mentioned when scientists are working towards building a more scientific literate public. The question is what does the public know about water quality, and how does it compare to other group populations (or cultural groups) such as water quality professionals, citizen science volunteers, or fishers? One method to answer this question is cultural consensus theory, which is comprised of analytical techniques and models that can help identify cultural beliefs and how individuals might be grouped based on these beliefs. To determine if there is a consensus between different cultural groups regarding water quality, an online survey of questions was administered to related government and non-profit groups, including social media outlets throughout eastern North Carolina and Virginia. During the survey, respondents identified themselves belonging to one of the following cultural groups: (1) water quality monitoring program volunteer, (2) water quality professional, (3) water quality educator, (4) fisher (both commercial and recreation), and (5) no experience with water quality. As of now, over 250 surveys have been completed. Using UCINET software, individual responses were tested against the aggregate responses from each group to determine if there was a consensus between the groups; multiple dimensional scaling was used to visually group the survey respondents to one another. Results from this study will help identify strengths and weaknesses when it comes to water quality knowledge for the establishment and/or improvement of education campaigns and citizen science projects.

GP64

Beyond the Pictures: Discourse Treatment Following TBI, *Morgan Alessandra Andrews, East Carolina University, Greenville, NC*

Discourse treatment for individuals with traumatic brain injury (TBI) has previously been a topic of concern. Cannizzaro and Coelho (2002) investigated the story grammar ability in the treatment of discourse production where researchers believed intervention for discourse deficits after TBI should reflect the interaction of linguistic and nonlinguistic processes. After the course of the treatment, participants increased their production of story grammar units but the improvements were not maintained at the 1 and 3 month follow-up. Penn, Jones and Joffe (1997) also applied a discourse treatment, specifically hierarchical discourse therapy to mildly impaired participants. The hierarchical discourse approach incorporated discourse as both the medium and goal of therapy, and also incorporated structured principles based in cognitive rehabilitation. Hierarchical discourse therapy seeks to compensate for a reduced linguistic flexibility by enhancing the variety of effective cognitive strategies and bringing the awareness what may have been automatic but inefficient methods before. The purpose of the current study was to determine if an intensive discourse treatment improves discourse production in adults with TBI. Intervention was modeled after hierarchical discourse therapy by integrating discourse comprehension and production and meta-cognitive and meta-linguistic processes. Therapy was intended to be intrinsically rewarding while the clinician provided repetition, structure, and prompts. The study included three participants (mean age= 46.67, males= 67%) who had sustained a TBI. The study was a 5-week intensive ABA design, with treatment 4 times a week for 3 weeks. Participants were instructed to tell a story based of the picture sequences while clinician provided prompts, scaffolding and repetition. All three participants increased their production of essential elements. Intensive discourse treatment resulted in improved discourse production, but improvements were not maintained at the 1-month follow-up.

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GP65

Sex Trafficking: The Perceived Support for Victims in Cusco, Peru, *Vanessa Dorismond, Brody School of Medicine, East Carolina University, Greenville, NC*

"Therapy is [not] doing foolish things and massages, and making them jump around..."

Peru is a country of transit, origin and destination for human trafficking with a larger emphasis on internal trafficking of women for sexual

exploitation. Three-quarters of the 4,000 females exploited in Peru are minors coming from low socioeconomic areas, such as Cusco, in search of work. However, and often through deception, these women and young girls fall victim to an infrastructure that is fueled by human rights violation. Although Peru has been making efforts to comply with the minimum standards for the elimination of trafficking in persons as set forth by the U.S. Government's Victims of Trafficking and Violence Protection Act of 2000, government funding remains low, efforts to identify and assist victims are still weak, and there is a significant lack of dedicated shelters for these trafficked victims. Nevertheless, for those victims that have been rescued, the psychological and physical trauma of this issue brings them in contact with providers and the few shelters available, thus allowing for the potential to identify therapeutic and educational support for victims, as well as interventions for Peru. Accordingly, this qualitative study sets out to explore the perception of providers within Cusco's community and their perceived description of the type of life and support given to these young girls after they have been removed from a life of sex trafficking. In doing so, this study hopes to elucidate information towards bettering the lack of support given to victims of sex trafficking in Peru, and across the world. By conducting semi-structured in-depth interviews, this study was carried out at a shelter for abused girls in Cusco where three employees and one volunteer at the shelter were interviewed. During the analysis of each interview in this study, three major themes emerged. These included 1) Peru's perceived role in combating sex trafficking, 2) the profile of victims at the shelter, and 3) the reasons these providers chose to work with victims of sex trafficking. Within these themes, deception, lack of government support, and government corruption were the main issues discussed by participants as reasons as to why there is such a lack of support for these victims of sex trafficking. However, despite these setbacks, as described by the participants, the shelter remains an exemplar of the success of shelters that have successfully aided these young victims therapeutically and educationally in order to help them cope and reintegrate into society. These findings will better emphasize the necessity of creating more shelters specific to victims of sex trafficking, the needs of those shelters to better support these girls and bettering Peru's role in combating human trafficking.

GP66

HIE implementation in North Carolina, Mengyuan Fang Farley, East Carolina University, Greenville, NC

Health information technology (IT) has been continuously innovated and the health information exchange (HIE) has been widely implemented, in order to facilitate real-time exchange of health information, enhance medical decision-making, increase coordination of care, reduce costs, and improve healthcare quality. However, challenges exist with technical data standards, governance and policy issues, and sustainability before HIE could be translated to widespread use.

Our study was carried out in a case-based approach. We used North Carolina as a sample to study the challenges faced by many HIE

practitioners as well as some solutions to overcome those problems. From our study, we found that consistency, both on technology and policy, is critical to enable free data transmission among various subsystems. Standards and policy expectations should be advanced to realize free data exchange across different organizations, platforms, and networks. The privacy issue, too long seen as a barrier to HIE, can be solved through a comprehensive framework that implements core privacy principles, adopts trusted network design characteristics, and establishes oversight and accountability mechanisms. The long-term financial sustainability for organizations facilitating HIE relies on the establishment of a sustainable business and financing model. To successfully implement the right business model for financial sustainability, questions need to be addressed on how HIEs raise initial capital, what type of model fee should be required, and how HIEs generate revenue to sustain operations.

GP67

Mental Health Stigma and Literacy in Integrated Care, Ashley Tucker, Kerry Littlewood, Allison Crow, East Carolina University, Greenville, NC

Stigma is a public health issue that prevents many from seeking mental health services (Hatzenbuehler et al., 2013). In addition to preventing some from seeking treatment altogether, stigma also is associated with mental health literacy, which refers to the knowledge and beliefs about mental disorders which aid their recognition, management or prevention (Jorm et al., 1997). There is an emerging body of evidence suggesting that integrated care programs, or the systematic coordination of general and behavioral healthcare (US Health and Human Services, 2015), help reduce stigma and increase mental health literacy experienced by those with health problems. The goal of this project is to assess stigma and mental health literacy for patients participating in an integrated health care clinic and examine if treatment adherence is associated with mental health stigma and literacy, Medicaid use, and body mass index (BMI). This study used a one-group pre-test only design to assess mental health stigma, mental health literacy, treatment adherence, BMI, and Medicaid use for 100 patients. Once consented, participants completed a paper and pencil Likert-scale survey during a regularly scheduled office visit. The Survey on Mental Health in Integrated Care (Crowe et al, 2014) was used to assess mental health stigma and literacy. Treatment adherence was determined by dividing the total appointments missed by the total number of appointments. BMI was obtained from electronic medical record. Medicaid use was self-reported. Results of this study indicate that patients with higher treatment adherence had lower mental health stigma/higher mental health literacy [$F(25, 75) = 1.817, p = .025$] and lower BMI [$F(25, 75) = 1.683, p = .044$]. Better knowledge of mental health conditions was associated with Medicaid use [$F(20, 80) = 2.29, p = .004$]. Results suggest that when patients are more knowledgeable and accepting of mental health, they may be more likely to show up for medical appointments and may be less likely to be overweight or obese. Furthermore, because patients receiving Medicaid were more knowledgeable about mental health conditions than other patients, future research could explore how information about mental health is disseminated by different health insurance plans.

GP68

Workaholism and Workplace Incivility: The Role of Stress and Psychological Capital, Lauren Lanzo, Shahnaz Aziz, East Carolina University, Greenville, NC

The current study aims to fill a gap in the research on incivility in the workplace by investigating who is more prone to engage in uncivil behaviors. Past research does not answer the more specific question of what dispositional factors cause stress to lead to incivility. Previous findings linking workaholism to greater stress levels, as well as an increased likelihood to engage in counterproductive work behaviors serve as theoretical evidence suggesting that workaholics may be more likely to engage in uncivil behavior as a result of their increased stress levels. We hope to add to the existing body of knowledge on incivility and workaholism by exploring the connection between workaholism, incivility, stress, and PsyCap. Consistent with previous research, we expect: (H1) stress will be positively correlated with incivility; (H2) individuals with higher PsyCap will report engaging less in uncivil behaviors; (H3) PsyCap will moderate the relationship between incivility and stress; and (H4) workaholism will be positively correlated with stress. We also hope to extend this research and propose: (H5) workaholism will be positively correlated with incivility; (H6) stress will serve as a mediating variable between workaholism and incivility; (H7) workaholism will be negatively associated with PsyCap; and (H8) PsyCap will moderate the relationship between the mediating stress variable and incivility. Linear methods will be used to test the causal models, however, a path analysis will be used to determine the relationship between workaholism, stress, incivility, and PsyCap as it is unknown whether stress will partially or fully mediate the relationship between workaholism and incivility.

GP69

Comparing Workplace Bullying Policies in the US and Abroad, Anna Elizabeth Casteel, East Carolina University, Greenville, NC

Apparently, the US is far behind other countries concerning workplace bullying. The United Kingdom, Australia, Canada and many countries have initiated policies to protect employees against workplace bullying. Social workers in such countries have supported the efforts by implementing many of those policies into their professional guidelines. The stark lack of workplace bullying policies in the US is alarming. Although the US has attempted to implement policy and awareness campaigns to reduce school age bullying, workplace bullying has far reaching implications affecting worker health, benefits, and well-being. Workers abroad have begun seeking relief from workers compensation insurance, which would impact US employers and awaken the courts. The authors conducted a systematic literature review to compare workplace bullying policies in the US and other countries. Longitudinal studies have provided data indicating the U.S. has allowed 26% more employees to experience workplace bullying than other countries. The distinctive lack of American workplace bullying definitions and policies may explain that 15% of employees experience bullying at any moment during

the workday. US research seems to indicate that employees who have experienced bullying within their workplace are more likely to quit their jobs and remain unemployed, due to the their overall health. Much of this research focuses on women-dominated professions such as nursing and teaching. Similarly, social workers may be experiencing workplace bullying although little may be confirmed due to the limited social work research. The research seems to indicate a lack in US policy to address workplace bullying even though the NASW Code of Ethics strongly rejects any tolerance for workplace bullying. Therefore, workplace climate and bullying are often dismissed for social workers. Literature also suggests that social workers should develop and implement clearly defined policies to address workplace bullying and advocate for laws that improve workplace climate in order to be productive, ethical social workers and responsible citizens. The authors formulate strong recommendations for workplace bullying policies based on their comparison of the US and countries abroad.

GP70

Dysgraphia, impact on an individual's sense of self throughout the life-course: A Systematic Review, Logan D Keziah, East Carolina University, Greenville, NC

Dysgraphia is a specified learning disability characterized by problems with spelling, poor handwriting, and issues getting thoughts on paper. While not as researched as other learning and attention difficulties, dysgraphia is very common; between 5 and 33% in school aged children (Overvelde & Hulstijn, 2010). Dysgraphia can be found co-morbidly with other learning differences such as dyslexia or attention disorders such as ADHD. Despite the recently growing body of research on the social and emotional impact of dyslexia in adulthood, research on dysgraphia in both childhood and adulthood has lagged behind. This poster presentation will present the findings of a Systematic Review of the literature examining how dysgraphia affects an individual's psycho-social development throughout the life course. Databases will be searched to find articles that address dysgraphia and the disorder's effect on an individual's self-concept throughout their life. Articles that address dysgraphia in conjunction with other learning or attention disorders will be included if the article address the combined disorders affect an individual's psychosocial development. Selected articles will then be critiqued against the following criteria: the strength of methodology, and the representation of gender and ethno-cultural differences in the experience of a learning disability. The goal of this research is to synthesize available literature on dysgraphia and to inform further study of the disorder by identifying gaps and proposing suggestions for future study.

GP71

The Temporal Puzzle: Reconstructing the Culture History of the Multicomponent Site Squires Ridge, Terry E Barbour, East Carolina University, Greenville, NC

Early Native American occupation of the North Carolina Coastal Plain is poorly understood. However, sites such as Squires Ridge (3IED365) along the Tar River in northeastern North Carolina have recently been identified to contain archaeological sequences to address problems related to this region's early prehistory. One such site is Squires Ridge located in Edgecombe county where excavations in 2006 identified a stratified sequence of four occupation zones dating from the Early Archaic to the Early/Middle Woodland (ca 11,500 – 2500 years ago). Test units dug in the southern portion of the site recovered stone and ceramic artifacts associated chronometric dates buried in a stratigraphic sequence about 1 meter deep. Using material recovered from the 2010 field season, I identify the stratigraphic sequence at the central section of Squires Ridge and compare it to the sequence at the southern end of the site. The stratigraphic analysis includes an examination of vertical distributions of artifacts combined with an artifact refitting study to identify buried occupation surfaces. Analysis of the 2010 data are largely consistent with the 2006 results but with a finer understanding of the stratigraphic sequence at the site. This stratigraphic sequence fills a gap in our understanding of the cultural chronology of the Tar River Valley and is an important step in understanding this regions prehistory and its relationship to the prehistory elsewhere in the Southeastern United States.

GP73

CAT Paths: Fair Route Productivity Standards, Margaret Reams Bizzell, Department of Political Science, Master of Public Administration, East Carolina University, Greenville, NC

The ECU strategic direction includes the goal to "serve as a national model for public service and regional transformation by creating a strong, sustainable future for eastern North Carolina through education, research, innovation, investment, and outreach." In line with the ECU mission, this project involves developing new route standards to ensure that vulnerable populations are not adversely affected by changes. The community partner for this research is Capital Area Transit (CAT) located in Raleigh, Wake County, North Carolina. CAT is modifying its route structures and needs the productivity of the routes to be evaluated. However, vulnerable populations (as defined by Title VI) which may be solely dependent on the public transportation system need to be accounted for so that these people will not be adversely affected by route changes. As such, the research question for this project is, "How can we update route productivity standards without adversely affecting vulnerable populations and adhering to Title VI requirements?" In order to assess the routes, multiple types of data are being compared, including route assessments from CAT's 2010 Route Assessment report, as well as comparing the fare and route structures of 10 peer transit agencies from around the country with similar service populations as CAT. The most valuable and interesting data came surveys and interviews that were conducted with current CAT drivers. The drivers were asked about the vulnerable populations they serve and the impact of certain routes on the community.

GP72

Raising an Exceptional child: Attachment, Parental Stress and Coping in Adoptive Parents, Biancas Cheri Smith, East Carolina University, Greenville, NC

Attachment is the bond formed between infants and their caregiver. An exceptional child is defined as those who have learning and/or behavior difficulty, physical disabilities, or sensory impairments. Attachment is critical to a child's well-being, and can be more difficult when a child has a disability, thus parents need to make extra effort to understand their child. This mixed method study investigated attachment as it relates to exceptional children and their adoptive parents. Levels of stress were investigated in how it affects an individual's perceptions of parenting skills.

This study included 30 adoptive families who were located throughout North Carolina. Quantitative data regarding attachment, stress, and coping strategies were measured using a modified version of the Parent Stress Index (PSI) and were analyzed using a Pearson Correlation to determine whether child characteristics (adaptability, distractibility, and acceptability) directly affected parental characteristics (parental depression, parental competence, and role restriction). Qualitative data collected consisted of open-ended questions related to parental competence, parental stress, parental depression, coping strategies, and attachment.

Preliminary results from the study will be presented.

GP74

Local Ecological Knowledge about Climate Change among Anglers in the Southeastern United States, Elizabeth Ann Brown-Pickren, East Carolina University, Greenville, NC

Resource users often amass local ecological knowledge about the resource. Anglers who fish in the same spot over time have knowledge of the fluctuations of types and sizes of species they target and environmental conditions where they fish, including water temperature, storm activity, anthropogenic inputs and changes in the area. A series of intercept surveys of anglers actively fishing along the coast in Georgia, South Carolina and North Carolina revealed that climate change is not perceived as the cause of changes in catch at a local level.

GP75

Stress, Physical Activity, and Psychological Outcomes among Military Spouses, Autumn Brenn Palmer, East Carolina University, Greenville, NC

Research suggests that military spouses' stress levels and satisfaction with the military lifestyle play a critical role in military member retention rates (Bowen, 1986; Dunn, 1993). The physical and mental health status of the military spouse also impacts the Department of Defense's allocation of health care expenditures (Congressional Budget Office [CBO], 2014). Participation in physical activity might reduce stress and improve health among this population, but few studies have considered the relationships among these variables. There were three purposes of this study: 1) To describe the physical activity and perceived stress levels among female military spouses; 2) To identify general and military specific factors associated with physical activity and perceived stress; and 3) To explore the relationships among perceived stress, physical activity, and depression. Participants completed the following questionnaires in an online survey delivered via Qualtrics: general and military demographic information, Godin Leisure-Time Exercise Questionnaire, Patient Health Questionnaire-8, and Perceived Stress Scale. Participants in the preliminary dataset ($N=189$) had an average moderate-to-vigorous physical activity score of 32.4 ± 22.8 and perceived stress score of 14.3 ± 6.9 . Physical activity was not significantly correlated with BMI, age, or employment status. Perceived stress had a significant negative correlation with age ($r=-0.19$, $p=0.02$), but was not related to employment status or BMI. There were no significant differences between military branches for physical activity or perceived stress scores. Physical activity was negatively associated with perceived stress ($r = -0.20$, $p=0.01$) as well as depression ($r=-0.20$, $p=0.008$). Conclusions: Military spouses in this sample had physical activity scores that are considered "active" enough to accrue substantial benefits from physical activity (cut-point = 24 units) (Godin, 2011). The mean perceived stress score of this population (14.3) is classified as slightly above normal (Cohen & Williamson, 1988). Presently, it does not seem that any particular demographic group of spouses requires special attention. Physical activity has a small association with stress and depression. Physical activity may play role in improving mental health outcomes among this population and future studies should explore these relationships over time.

GP76

The Effect of Conservation Treatments on Organic Residues in Archaeological Ceramics, Sophia Carman¹, Laura Mazow², Susanne Grieve³, Siddhartha Mitra⁴,

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Archaeological conservation techniques, while focused on preserving the physical form of a ceramic vessel, may destroy other pertinent information provided by organic residues. In this research, the effect of conservation techniques on lipid preservation in archaeological ceramic sherds were investigated through organic residue analysis via organic extraction followed by gas chromatography-mass spectrometry (GC-MS) analysis. Archaeological ceramic sherds from a site in Jordan were treated with olive oil to emulate an organic residue that is frequently found in the archaeological record of the Near East. Subsequently, archaeological conservation techniques, such as mechanical cleaning, soaking in water, and chemical cleaning, were applied to the sherds. Lipid retention was then quantified by GC-MS analysis to better understand how various conservation techniques commonly used in the field and the lab today affect the preservation, contamination, or destruction of organic residues. The data gathered from this study will assist in predicting the condition of organic residues on ceramics based on previous conservation treatments and provide a set of recommendations for the proper handling, treatment, and storage of ceramics that focuses on the preservation of organic residues.

GP77

Osteoporosis Knowledge and Health Beliefs in Middle-Aged Men: The need for intervention, Susan Marquez¹, Oyinlola T.

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About one in two women and one in four men over the age of 50 will break a bone due to osteoporosis. Osteoporosis is currently responsible for two million broken bones and this number is expected to increase by 2025 due to the aging of the population (NOF, 2014; Reginster, 2006). Men have a higher mortality rate one-year post bone fracture than women (Cunningham et al., 2014). Few studies have addressed osteoporosis knowledge in men, but focus has been on the elderly or young adults (Johnson et al., 2008), with scanty information on middle-aged men. The purpose of this study was to understand the level of osteoporosis knowledge and health beliefs among middle-aged men. The study also analyzed the

effects of education and income level on osteoporosis knowledge and health beliefs. A cross-sectional study design approach was used for this study with participants recruited through college students and questionnaires administered to participants via Qualtrics, an online survey system. Osteoporosis knowledge was measured using the Osteoporosis Knowledge Test, a 24-item questionnaire. The Osteoporosis Health-Belief Scale, a 42-item questionnaire with six subscales, based on the Health Belief Model theoretical framework, measured osteoporosis health-beliefs. A demographic survey was also administered. Descriptive statistics and ANOVA tests were computed for the outcomes of interest. Statistical significance was set at the $p < 0.05$ level. A total of 262 men aged 36-55 years participated in the study (76% Caucasians, 17% African Americans, 7% other racial groups). Findings showed limited osteoporosis knowledge with mean total score of 12.03 ± 3.97 . ANOVA tests showed a significant difference between income level and health-belief subscales. There was also a significant difference between education level and osteoporosis knowledge [$F(3,262) = 3.68$, $p = 0.013$], 'perceived seriousness' [$F(3,264) = 2.99$, $p = 0.031$], 'barriers to calcium' [$F(3,265) = 6.90$, $p = 0.0001$], and 'health motivation' [$F(3,265) = 5.57$ $p = 0.001$]. Education and income have some influence on participants' osteoporosis knowledge and health beliefs. Findings from the study showed that men in the mid-life years have limited knowledge regarding osteoporosis. The results also suggest the need to develop education programs with innovative approaches to promote bone health among men in their mid-life years, which could be the appropriate time to start osteoporosis interventions. Effort should involve minority populations.

GP78

A Comparative Analysis of a Potential Tavern Site in Jackson, North Carolina, Katherine D. Thomas, East Carolina University, Greenville, NC

Residents of Jackson, North Carolina in Northampton County have found what they believe to be an 18th century tavern site. The area was inhabited by the Tuscarora until the Tuscarora War ended in 1715, after which European settlers began to move into the region. The residents of Jackson believe this to be a tavern owned by Jeptah Atherton. This research assesses this claim by comparing those artifacts to the artifacts at three other contemporary sites: Dudley's Tavern in Halifax, North Carolina, Wetherburn's Tavern in Colonial Williamsburg, and the Palmer-Marsh house in Bath, North Carolina. This will also provide a chance to create an artifact pattern for North Carolina's colonial taverns.

GP79

Couple Quality, Parent-Child Relationships and Parenting Efficacy of Incarcerated Individuals, Brooklyn L Corbett, East Carolina University, Greenville, NC

Existing research indicates that adult relationships are shown to influence parenting practices and parent-child relationships (e.g., Grych & Fincham, 2001), and that individual well-being and relationship happiness may be influenced by one's relationship status (Kamp, Dush & Amato, 2005). To our knowledge, however, no studies have examined these relationships within an incarcerated sample. Individuals and families who experience incarceration face a number of unique challenges, and research has shown the importance of the couple and parental relationships to reducing recidivism (e.g., Berg & Huebner, 2011). Additionally, research indicates that maintaining healthy parent-child relationships while incarcerated promotes positive youth well-being (Miller, 2006). Thus, understanding the association between couple quality and both parent-child relationships and parenting efficacy is important to consider within the context of incarceration.

Furthermore, the relationship with the co-parent is important to address, regardless of whether or not co-parents are currently in a couple relationship. Research suggests that co-parent relationship quality is indicative of the amount of contact the offender has with his/her children (Poehlmann, 2005). As such, the current study also examined the influence of co-parent relationship quality on the parent-child relationship and parenting efficacy. Finally, we examined whether these relationships were moderated by relationship status (i.e., committed relationship, not in a committed relationship), race, or gender.

Utilizing a sample of 131 incarcerated adults, results indicated that couple quality was positively associated with parent-child relationship ($= .278$, $p < .01$) and parenting efficacy ($= .221$, $p < .05$). Relationship status moderated the association between couple quality and parent-child relationship ($= .331$, $p < .01$). For those currently in a committed relationship, parent-child relationship quality increases as couple quality increases. The relationships between co-parenting quality and the outcome variables were not significant. However, relationship status moderated the relationship between co-parenting quality and parent-child relationship ($= -.198$, $p < .05$), and parenting efficacy ($= -.229$, $p < .01$). For those currently in a committed relationship, parent-child relationship quality and parenting efficacy increase as co-parenting quality increases. Implications and future directions will be discussed.

GP80

How Media Representations of African American Women Impact the Body Image and Sexual Health of African American Teenage Girls, Crystal Monique Stroman, East Carolina University, Greenville, NC

It is widely known that media influences have a profound effect on the self-perception and body image of women and girls (Dittmar, 2009). Throughout history, body image has been influenced by various facets of the mass media, and is directly related to negative body image (Derenne & Beresin, 2006). According to Dittmar (2009), body dissatisfaction, defined as the experience of negative thoughts and esteem about one's body, is connected to a range of physical and mental health problems, including eating disorders, obesity, body dysmorphic disorder, depression, and low self-esteem. Therefore, it can be claimed that body image is an essential part of physical and mental wellbeing. Studies have shown that body dissatisfaction is one of the most consistent and significant precursors of negative self-perception, negative emotional states, and unhealthy body-related behaviors (Dittmar, 2009). One of the aspects that can be greatly influenced by the media's impact on body image is sexual health (Chan, Yu Leung, & Williams, 2012). In African American women, under-representation in what is popularly considered beautiful (Hopson, 2009), and hyper-sexualized images have a direct impact on the body image of African American women and girls (Collins, 2004). This paper aims to study the impact of media representations of African American women on the body image of African American teenage girls, and how this affects the sexual health of these girls, as well as offer insight into the ways in which community efforts can be used to proactively improve their sexual health.

GP81

Self-management behaviors and social support for African American Women Caregivers with Type 2 Diabetes Mellitus, Kerry Littlewood, Ph.D., MSW, Lesley Lutes, Ph.D., Doyle M. Cummings, Pharm.D., FCP, FCCP, Bertha Hambridge, MD, MPH, Sobale Vu, BS, Chelsey Solar, MS, Abhishek Pandey, MD, East Carolina University, Greenville, NC

Objective: Investigate the impact of providing care to someone else (caregiving) on the caregiver's self-care activities, social support and glycemic control among African American women with Type 2 Diabetes Mellitus (T2DM). Poor self-management behaviors and social support are associated with poor glycemic control (Griffith et al., 1990; Rhee et al., 2005), and increased risk of hospitalization and mortality (Ho et al., 2006). This study used data from the EMPOWER! Trial, a twelve month randomized-controlled trial of cognitive behavioral lifestyle intervention and social support with 200 Rural AA women with uncontrolled diabetes ($HbA1c > 7.0$), to examine caregiving status, medication adherence, self-care practices, social support and glycemic control.

Methods: Glycemic control ($HbA1c$) was recorded and self-report

measures were used for all other variables and completed by 193 patients. Descriptive statistics and one-way ANOVA were conducted to compare means. Logistic regression was used to analyze the effect of caregiver status on medication adherence (Modified Morisky Adherence Scale), social support (Adapted Dunst Family Support Scale), and self-care (Summary of Diabetes Self Care Activities Measure).

Results: 38.5% ($n=77$) were caregivers who reported lower adherence to their medication [$F(1, 192) = 12.855, p = .000$], fewer self-care behaviors [$F(1, 192) = 4.638, p = .033$], and more adequate social support [$F(1, 192) = 2.880, p = ns$] than non-caregivers. Caregivers were more likely to report lower medication adherence [$B (1.769), p = .008$] and more likely to report higher social support [$B(.299), p=.039$] when controlling for self-care activities.

Conclusion: This study suggests that caregivers are at increased risk of medication non-adherence and may need to be given more assistance with staying adherent. Regardless of self-care activities, caregivers report higher social support. Interventions could be tailored to better meet the demands and needs of caregivers, particularly about adherence to medication and how to best integrate available social support to assist with medication. Self-care for caregivers is of utmost importance with respect to the longevity of the caregiver and their ability to provide care for their children, spouses and others entrusted to their care.

GP82

Effects of Instruction Method on Vital Capacity and Maximum Sustained Phonation in Adult Male Controls, Cara L Julian, East Carolina University, Greenville, NC

In the field of speech-language pathology, aerodynamic measurements, such as vital capacity and maximum sustained phonation, can be used to help with assessment and treatment of vocal disorders. Currently, there is little research based on what type of instructions should be given to a patient during certain tasks that are measured during evaluations of voice disorders. Two of these tasks, maximum sustained phonation (MSP) and vital capacity (VC) are used often and the lack of information on proper instructions is problematic. The purpose of this study was to determine the effect of instruction and visual feedback during the collection of VC and MSP tasks. Five male participants were included in this study and each participant performed a total of 12 MSP tasks. 6 trials were conducted while sustaining the vowel /i/, and 6 trials during the vowel /a/. For each vowel sound, /i/ and /a/, 3 trials received visual feedback from the examiner during collection and 3 did not. The duration of each sustained vowel was recorded. Each participant also performed 6 VC tasks. Participants were instructed to exhale utilizing a "slow" exhalation for 3 of the trials (8-10 seconds) and a "fast" exhalation (3-6) seconds for the other half. The order of MSP and VC tasks were randomized for each patient. These data were compared to previous data on females. Descriptive analyses of the data revealed that instruction and visual feedback provided no practical significance in predicting length of MSP or amount of air exhaled during VC.

GP83

Importance of Mathematics Practice in Food and Nutrition Science Education, *Sarah Gregory Sykes, BS, Diana Saum, MS, RD, and Melani Duffrin, PhD, RD, LDN, Department of Nutrition Science, East Carolina University, Greenville, NC*

Mathematics is a key component of the foundational knowledge needed to meet the competency standards of a successful food and nutrition professional. A researcher developed questionnaire was administered to fall semester, senior-level nutrition science students ($N=34$) pertaining to mathematics operations related to food and nutrition science skill sets. Students answered 20 multiple choice questions selected from widely utilized academic textbooks in the field of nutrition science studies under the categories of percentages, food labels, formulas, graphs, and cost-control. Eighty percent or more of students answered questions correctly in the areas of percentages, food labels, and graphs. One question pertaining to formulas presented the students with extreme difficulty. Only 5% ($N=2$) of students answered the question correctly. The level of difficulty was related to the lack of conversion knowledge necessary to complete the question because the information would be presented later in Medical Nutrition Therapy II. Individuals that answered the question correctly likely used deductive reasoning to guess the correct answer or had previously acquired knowledge of the conversion factors. Cost-control did not meet the expected outcome of 80% or more of students answering the section correctly. This can be explained by the newness of applying the mathematics operations relating to cost-control. At this point in the students' academic career, cost-control has just been introduced and practice is required to improve student understanding and skills. Overall, a trend among the questions where fewer than 80% of students answered correctly was noticed among the questions that required utilization of conversion information regarding calories from fat, protein, and/or carbohydrates. Students either lacked the fundamental knowledge of calories from fat, protein, and carbohydrates and/or the ability to apply this conversion concept. Regular assessment of mathematics knowledge and skills is important for undergraduate nutrition science programs. Mathematics skills are often assumed and/or expected of students. Placing more emphasis on mathematics practice in the undergraduate nutrition science curriculum can serve to fine tune mathematics application skills and improve subsequent workplace performance.

GP84

The Phelps Canoes: Testing Retreatment Strategies on Sucrose-treated Wooden Objects, *Michell J Gilman, East Carolina University, Greenville, NC*

Two prehistoric canoes were retrieved from Lake Phelps in the mid-1980s and were conserved through the application of sucrose solution treatments.. The purpose of this study was to learn what retreatment strategies would be optimal for treating the first Canoe, LP 3 so that it will be ready for exhibition Spring 2015. The initial research plan focused on this canoe, however, there are many fragments (LP 3 is in four fragments and LP 4 is in eleven fragments) that display a wide array of surface deposits in the form of crystallized sugars, and varied degrees of degradation and fragility. The varied conditions prompted experiments on samples from each of the canoes in order to establish a foundation from which future conservators might refer to for conservation retreatment strategies of wooden artifacts in similar situations.

GP85

The Youth Public Arts Program: Interpersonal and intrapersonal outcomes for at-risk youth, *Christina Lauren Hall, East Carolina University, Greenville, NC*

This poster presentation reviews the process and findings of a program evaluation of the Youth Public Arts Program, a long-standing community based art program that serves at-risk youth in Eastern North Carolina. The program evaluation was undertaken to examine the art skills, social and interpersonal skills, and community involvement of the participants. The study included four focus groups and telephone surveys with a total of 38 stakeholders (program participants, parents of participants, program staff and referral sources). Results indicated that the at-risk youth had gains in both interpersonal and intrapersonal skills, including family relationships, peer relationships, community interaction, increased art skills, confidence, and self-regulation. This article adds to the very limited literature on community based art programs for youth.

GP86

Feeding the city: Isotopic reflections of diet at 1st century Petra, Jordan., Laurel Appleton, Megan Perry, Department of Anthropology, East Carolina University, Greenville, NC

Petra's urban fluorescence in the 1st century A.D. implies that city residents had eschewed their formerly nomadic existence and fully embraced a sedentary lifestyle. However, little is known whether or not local agricultural fields in this arid environment could have fully supported the diet of city residents, let alone provided fodder for meat sources such as sheep and goats. Paleobotanical, archaeological, and papyrological data indicate that local agricultural production included water-intensive C3 plants such as barley and wheat along with more environmentally-suitable C4 plants such as millet. In addition, herd animals were brought in "on the hoof" for consumption based on zooarchaeological data. Here, we analyze carbon and nitrogen isotopes of non-elite inhabitants of Petra from the North Ridge Tombs to understand to what extent city residents relied on C3 plants and animal protein, items likely supplemented by imported sources due to the city's environment, and the variability of the city residents' diet. The relatively similar ^{13}C and ^{15}N bone collagen andapatite values from 34 individuals suggest that a typical Petraean diet consisted mostly of C3 plants, likely comprised of local and imported grains as local production could not have supported the urban population that was supplemented significantly by animal sources. These results not only provide indication of the city's reliance on imported foodstuffs, but also will allow more informed interpretations of other isotope data on population mobility. This research is partially supported by NEH Collaborative Grant RZ-51555-I3.

GP87

Clubhouse Program for At-Risk Youth in West Greenville: Exploring the Impact of Peer, Home, and School Self-Esteem, Susan Marie Tapp, Kerry Littlewood, East Carolina University, Greenville, NC

The Third Street Community Center is a faith-based Christian community center located in the heart of West Greenville, North Carolina, an area facing high poverty rates, single parent households and substantial health disparities (Littlewood, 2013). Youth in the area, particularly those who spend most afternoons unsupervised, are exposed to several risk factors, including gang involvement and poor academic performance. This study enrolled ten of these youth to participate in a pilot after school program called Clubhouse. The goal of clubhouse is to increase youth self-esteem by providing the following treatment: 1) a safe place in the afternoon to build positive relationships, 2) participation in spiritual activities, and 3) exposure to arts. Self-esteem appears to be an important concept to measure in school-aged children. A pre-post test one-group only design was used to test the mean differences between how youth scored before and after participation in twelve weeks of the

Clubhouse program. Additional qualitative data included open-ended questions at the end of survey. The Hare Self-esteem Scale (HSS) (Hare, 1980), a 10-item rapid assessment instrument developed to measure self-esteem in school-aged children, was used in this study. Items are scored on a four-point Likert scale and higher scores indicate higher self-esteem. The HSS identifies three important sources of self-esteem in children through the structure of three subscales that measure home, peer, and school related self-esteem. Results indicate that peer popularity, attention at home, feeling loved at home, and academic competency improved between pre and post test, although not at a statistically significant level. Open-ended questions at the end of the survey indicated that the youth were very satisfied with participating in the program. In conclusion, this pilot provides some initial evidence that the Clubhouse Program can improve self-esteem in at-risk youth; however limitations, such as small sample size and lack of comparison/control group, hinder the generalizability of the findings. More research is needed to determine which component of the Clubhouse model was the most impactful for youth and how much treatment dose (weeks of programming) would be required to show statistically significant effect.

GP88

Isotopic evidence for the origins of homicide victims from Qasr Hallabat, Kathryn A. Parker¹, Megan A. Perry¹, Drew S. Coleman², David L. Dettman³

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Qasr Hallabat, a luxurious Umayyad (7th – 8th century A.D.) desert retreat in Jordan, declined after the mid-8th century due to political destabilization and seismic activity. Despite official abandonment, the qasr's extensive hydraulic resources were utilized by local groups. Excavation and restoration of the qasr by the Spanish Archaeological Mission discovered the remains of six individuals at the bottom of an internal cistern, a precious regional water source. These individuals, who perished between 772-895 CAL A.D., showed perimortem blunt and sharp force trauma. While it is clear that these individuals were victims of homicide, the reason for dumping their corpses into a viable water source remains uncertain. This latter situation makes it likely that the perpetrators were non-locals, but who were the victims?

Strontium and oxygen isotope ratios from dental enamel were used to identify their origins, which can shed light on the circumstances surrounding their death. When compared to archaeological faunal samples and published data on regional oxygen and strontium isotope variation, it is possible to determine if these individuals are from geological region similar to Hallabat. If they are indeed locals, this would indicate that the Hallabat region continued to be an economic crossroads even after the post-Umayyad decline.

GP89

Determining the function of Cul-5, a ubiquitin ligase, in Drosophila oogenesis., Victoria Leigh Hardy, East Carolina University, Greenville, NC

The unique ability of stem cells to produce or become various types of cells has made them pertinent in several areas of science. Great strides have been made in stem cell research, however, there is still more we need to learn, especially when dealing with their cellular interactions *in vivo*. The Cullin family is part of a larger group known as E3 ubiquitin ligases. These proteins are involved in the targeting of proteins destined for cellular degradation. They have also been identified in the control of cell cycle progression. Previous studies have implicated the Cullin family member Cul-5 in the cell cycle in differentiated cells; however, it is unclear whether Cul-5 is specifically involved in stem cell proliferation. Drosophila oogenesis provides a unique model for these studies. Not only are we able to see how the cells communicate to one another but there are also two sets of stem cells within this system to analyze, germline and follicle stem cells. Drosophila melanogaster, the fruit fly, also contains many genes that are conserved in humans which will allow this research to expand into the realms of medicinal applications, such as regenerative therapies and cancer treatments. By analyzing two different loss-of-function Cul-5 mutants we have been able to ascertain new phenotypes, such as improper follicular capsulation of the stage 3 cyst, multiple stem cell niches, and the loss of pre-vitellogenesis stages. Data compiled thus far also shows that Cul-5 mutants have a significant decrease in rate of proliferation when compared to their sibling controls. Future experiments will examine the molecular pathways affected by loss of Cul-5 in this system.

GP90

The function of Hrb27c in Drosophila oogenesis, Danielle Sydney Davis Finger, East Carolina University, Greenville, NC

The use of stem cells as a tool for regenerative therapies holds enormous promise in aiding the return to normal function in damaged tissues and organs in human health. Stem cell maintenance and proliferation is a highly regulated process and small changes in their environment can cause drastic functional alterations. To be able to use stem cells as tools for therapy, we must first understand the molecular mechanisms that control their function *in vivo*. The Drosophila melanogaster ovary provides the ideal place to study the mechanisms of stem cell maintenance *in vivo*. Drosophila ovary stem cell populations are well characterized and known to be highly sensitive to changes in organismal physiology. One of the best-characterized signaling hormones that controls germline stem cell (GSC) maintenance within the ovary is the steroid ecdysone. It is necessary for GSC proliferation and maintenance of the GSC fate, and is crucial for differentiation of GSC progeny. Heterogeneous nuclear ribonucleoprotein at 27c (Hrb27c) has been suggested as

a possible downstream target of the ecdysone signaling pathway. Hrb27c is a member of the heterogeneous nuclear ribonucleoprotein (hnRNP) family of RNA binding proteins that aid in the localization, maturation, and translation of newly formed RNAs. To gain further insight into the function of Hrb27c in Drosophila oogenesis, we are investigating whether and how Hrb27c regulates GSC proliferation and maintenance. Using Flippase/Flippase Recognition Target (Flp/Frt)-mediated recombination, we created homozygous Hrb27c mutant GSCs and used molecular markers to track their fate. Our preliminary results show that Hrb27c mutants had greater GSC loss than controls, suggesting that Hrb27c may be involved in GSC maintenance. Future experiments will be aimed at determining the cause of GSC loss and testing for additional proliferation defects. This will allow a better understanding of the function of Hrb27c in Drosophila oogenesis, and provide insight into the mechanisms that control GSCs *in vivo*. This research will provide further insight into how stem cells function within a living organism, and could aid in potential medical uses of stem cells for regenerative therapy.

GP91

Alteration of Skeletal Muscle Lysophospholipid Metabolism in Mouse and Human Obesity, Patrick J. Ferrara, Timothy D. Heden, Christopher W. Paran, Sanghee Park, Joseph A. Houmard, Katsuhiko Funai, Department of Kinesiology, East Carolina University, Greenville, NC

Aberrant muscle lipid metabolism has been linked to the development of obesity-induced insulin resistance. However, the exact lipotoxic agents that promote human diabetes remain elusive. To describe muscle-specific lipid milieu free of contaminating cells high in lipid content, we studied primary muscle cells isolated and differentiated from human muscle biopsies. A comprehensive lipidomic analyses revealed differences in various species of phospholipids between the lean-insulin sensitive (LN) and obese-insulin resistant (OB) groups. To identify genes that contributed to these differences in the lipidome, we conducted RNAseq analyses and found three genes that are involved in lysophospholipid metabolism (Pppap2a, Lpin3, Lpcat3) to be differentially expressed. Other isoforms of these genes were either not highly expressed or not differential between LN and OB samples. In mouse skeletal muscles, only Pppap2a and Lpcat3 were highly and differentially expressed between lean and obese mice. In conclusion, muscle lysophospholipid metabolism appears to be altered with obesity, and Pppap2a and Lpcat3 were implicated as potential candidate genes responsible for these changes. Future research should investigate the potential roles that muscle lysophospholipid metabolism and these genes have in regulating muscle insulin sensitivity.

GP92

Examination of the Mechanism of Intersubunit Communication in Pyruvate Carboxylase Hybrid Tetramers,
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East Carolina Diabetes and Obesity Institute, Greenville, NC

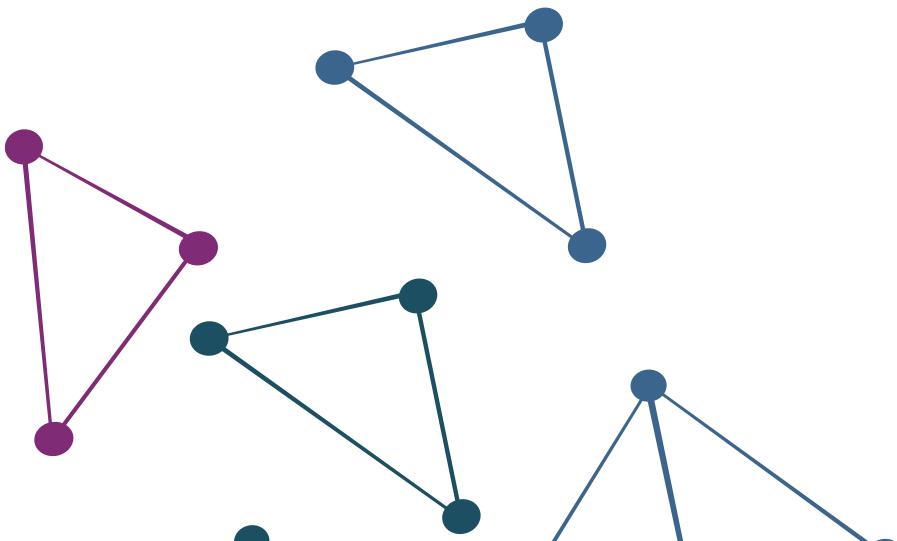
Pyruvate carboxylase (PC) is a biotin-dependent, homotetrameric enzyme that is responsible for the catalytic conversion of pyruvate to oxaloacetate in the presence of HCO₃⁻, MgATP, and the essential allosteric activator, acetyl-CoA. PC is a critical anaplerotic enzyme in glucose metabolism, serving to replenish oxaloacetate consumed by the TCA cycle. Increased production of acetyl-CoA, due to high lipid supply, has been shown to upregulate PC activity in the liver, which contributes to the development of obesity-induced insulin resistance and Type 2 Diabetes. Previous X-ray crystallographic studies have identified the four distinct domains within the PC monomer, namely the biotin carboxylase (BC), biotin carboxyl carrier (BCCP), carboxyl transferase (CT), and allosteric domains. Additionally, each domain has been functionally characterized via steady-state kinetics and site-directed mutagenic studies of catalytically relevant residues. The tetramer is arranged as a dimer of dimers, with one PC dimer of antiparallel monomers composing each face of the tetramer. While pyruvate binding is shown to trigger the movement of the BCCP domain to an opposing polypeptide chain, it is not known whether this is facilitated through an inter- or intramolecular "signal." To determine whether structural interactions between the domains on a single PC monomer are driven by intermolecular or intramolecular mechanisms, we have designed a PC hybrid tetramer (HT) consisting of two strategically chosen mutants: one with an inactive BC domain and wild-type CT domain (E218A); and the other with a wild-type BC domain and a CT domain exhibiting a 100-fold increase in V_{max} and 7-fold increase in K_m for pyruvate as compared to wild-type (T882S). Preliminary steady-state kinetics of the full-forward reaction catalyzed by the PC HT (E218A:T882S) shows that V_{max} is achieved at low concentrations of pyruvate compared to the T882S mutant. These data, in conjunction with the observed two-fold decrease in V_{max}, suggest that the mechanism of communication between the BC and CT domains on a single monomer is intermolecular. Further study, including kinetic analysis of the BC domain reaction, as well as generation and analysis of triple mutants across the three domains, will be used to elucidate functional coupling across the BC, BCCP, and CT domains within each subunit of the PC tetramer.

GP93

Thermodynamic Analysis of the Catalytic Regulatory Mechanism of Pyruvate Carboxylase, Stephanie Adams, Lauren Westerhold, Tonya Zeczycki, Brody School of Medicine, Department of Biochemistry and Molecular Biology, ECDOI, Greenville, NC

Pyruvate carboxylase (PC) is a critical enzyme that has been implicated in the pathogenesis of various disease states due to its involvement in multiple metabolic pathways. More specifically, an increase in PC activity in hepatic cells has been linked to the pathogenesis of Type 2 diabetes. PC catalyzes the first committed step in gluconeogenesis, replenishes TCA cycle intermediates and plays a role in lipogenesis. PC is a multifunctional, biotin-dependent enzyme that catalyzes the MgATP-dependent carboxylation of pyruvate by HCO₃⁻ to form oxaloacetate. The overall reaction catalyzed by PC involves two partial reactions in two distinct domains and is allosterically activated by acetyl-CoA (ACoA). The mechanisms of these partial reactions and the substrates involved have been determined, however, the mechanism by which PC is regulated and the influence ACoA has on coordinating catalysis between the distinct subdomains remains unanswered.

We will construct a regulatory mechanism of PC activity by examining the kinetic and thermodynamic properties of PC activity. ACoA couples MgATP-cleavage in the biotin carboxylase (BC) domain to oxaloacetate production in the carboxyl transferase (CT) domain on an opposing polypeptide chain. Previous kinetic studies have shown that the effects of ACoA binding in the allosteric domain primarily influenced the coupling of MgATP-cleavage with biotin carboxylation necessary for the secondary reaction to proceed in the CT domain. Thermodynamic linkage analysis will be used to quantify thermodynamic allosteric interactions between substrate-activator and substrate-substrate interactions such as MgATP-ACoA, pyruvate-ACoA and MgATP-pyruvate. Kinetic assays with recombinant PC have showed that thermodynamic coupling exists between MgATP and ACoA whereas there is no observed coupling between pyruvate and ACoA. Further kinetic studies observing the thermodynamic coupling between MgATP and pyruvate, with and without the activator present, will allow us to identify the activation effects of ACoA binding and to observe the influence of altering the energetic coupling of ligand binding on PC activity. Constructing a complete catalytic mechanism of PC activity will aid in the advancement of therapeutics for Type 2 diabetics.



GP94

Resveratrol Alleviates Lipid-Induced Insulin Resistance in Lean, But Not Severely Obese Myotubes, Kristen Turner^{1,2}, Sanghee Park^{1,2},

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Excessive lipid exposure is associated with various disease states, including severe obesity ($BMI > 40 \text{ kg/m}^2$), and can lead to insulin resistance. This whole-body defect in insulin action following chronic lipid exposure is also observed at the cellular level, as myotubes from severely obese humans have a blunted response to insulin. Resveratrol, a natural polyphenolic compound, has been proposed to improve these defects in insulin signaling; however, it is uncertain whether resveratrol can recover the acute and imprinted defects associated with lipid exposure. To examine this, human skeletal muscle cells were isolated from muscle biopsies obtained from lean ($BMI = 21.21 \pm 0.50 \text{ kg/m}^2$) and severely obese ($BMI = 53.41 \pm 1.61 \text{ kg/m}^2$) individuals, and differentiated into myotubes. Myotubes were exposed to palmitate (0.45 mM) for 16 hours to induce insulin resistance in the presence or absence of resveratrol (0.2 μM). Myotubes were then treated with insulin (100 nM) and harvested for examination of insulin signaling. Palmitate suppressed insulin-induced phosphorylation of AKT (Ser473) by 38% in lean myotubes, which was rescued with resveratrol treatment. Conversely, in comparison to lean controls, resveratrol treatment did not improve insulin action in obese myotubes. These data show that resveratrol treatment can enhance insulin signaling following acute lipid exposure; however, it cannot improve the inherent defects associated with severe obesity.

GP95

Intramyocellular Triacylglycerol is Associated with Peroxisomal Biogenesis in Skeletal Muscle from Lean and Obese Humans, Tai-Yu Huang¹, Donghai Zheng¹, Sanghee Park¹, Joseph A. Hounard^{1,3} and Robert C. Hickner^{1,2,3}, and Ronald N. Cortright^{1,2,3}

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Obesity is associated with elevated levels of lipids (intramyocellular triacylglycerols; IMTG) and reductions in mitochondrial fatty acid oxidation in skeletal muscle, both of which are associated with insulin resistance. Known predominately for their actions in liver, peroxisomes are subcellular compartments essential for lipid disposal by chain-shortening very long- and long-chain fatty acids to acyl-carnitines, permitting CPT-I independent entry into the mitochondria for oxidation. We hypothesized that peroxisome proliferation in human skeletal muscle occurs as an adaptive response to elevated lipid supply and accumulation (IMTG) which could facilitate mitochondrial fatty acid oxidation. Assays for the peroxisomal biogenesis marker PEX19 protein content and IMTG were assessed using vastus lateralis from obese and lean humans. Peroxisomal

membrane protein 70 (PMP70) was measured after lipid incubation of human skeletal muscle primary myotubes. Results: 1. A significant relationship between tissue IMTG and PEX19 was identified in human skeletal muscle tissue ($P < 0.05$) but not % body fat or BMI 2) PEX19 protein content was elevated ($P < 0.05$) in tissues from obese individuals with high IMTG and 3) An increase in peroxisomal PMP70 was observed ($P < 0.05$) with high fat incubation of human primary myotubes. Conclusion: This is the first report associating lipid oversupply, IMTG accumulation, and peroxisomal biogenesis in human skeletal muscle suggesting a functional-adaptive role for peroxisomes in mitochondrial lipid oxidation and obesity.

GP96

Acute Reversal of High Fat Diet-Induced Insulin Resistance is Accompanied by a Restoration of Redox Status in Skeletal Muscle, Lauren R Reese^{1,2}, Terence R Ryan^{1,2}, Maria J Torres^{1,3} and P Darrell Neufeld^{1,2,3}

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High fat diet (HFD) leads to insulin resistance in skeletal muscle; interestingly, a single overnight fast, exercise bout, or low-fat meal acutely reverse HFD-induced insulin resistance in rodents. To explore the potential underlying mechanism(s), male wistar rats ($\sim 300 \text{ g}$, 8/group) were fed a 10% low fat (CTL) or a 45% HFD for 3 wks, with a third group fed HFD followed by a 24h fast (HFD+24h fast). In response to oral glucose tolerance testing, area under the curve for blood glucose was higher ($p < 0.05$) with HFD and was restored to CTL by 24h fast (CTL 29.9 ± 1.3 ; HFD 37.8 ± 2.4 ; HFD+24h fast 30.4 ± 1.2 ; mean \pm SEM). In soleus muscle, insulin stimulated 2-deoxyglucose uptake was decreased by HFD and partially restored by 24h fast. In permeabilized fibers of red gastrocnemius (RG), maximal fatty-acid supported ADP-stimulated respiration was increased in HFD state, but returned to CTL rates after 24h fast (CTL 141 ± 33 ; HFD 173 ± 43 ; HFD+24h fast 83 ± 9 ; pmol/s/mg dw). The reduced to oxidized ratio of glutathione (GSH/GSSG) in RG was decreased by HFD, indicative of an oxidative shift in cellular redox state, but was restored by 24h fast. These data suggest that acute reversal of HFD-induced insulin resistance is accompanied by restoration of mitochondrial respiratory function and redox state, supporting a redox control mechanism over insulin sensitivity.

GP97

Isolated Proteoglycan Used to Study Hyaluronan, Samantha S. Sellers and Cheryl B. Knudson, Department of Anatomy and Cell Biology, Brody School of Medicine, East Carolina University, Greenville, NC

Proteoglycans and hyaluronan are major components of articular cartilage. The proteoglycan termed aggrecan is organized as a multicomponent aggregate in cartilage composed of aggrecan monomers bound to a core filament of hyaluronan. Thus, hyaluronan serves to retain aggrecan in the cartilage matrix; but also provides the tether of these matrix components to the chondrocyte cell surface by binding to the CD44 receptor. CD44 is a class I transmembrane glycoprotein that binds hyaluronan. Alternative exon splicing generates CD44 variants, including truncated forms that no longer exhibit the capacity to bind hyaluronan and soluble forms consisting of extracellular domains (e.g., CD44-ecto). Aggrecan was isolated from articular cartilage cut from bovine metacarpophalangeal joints. The cartilage was extracted using 4.0 M guanidine HCl, 0.05 M NaAcetate pH 5.8 followed by dissociative CsCl density gradient centrifugation. The bottom 1/5 of each centrifuge tube was isolated, dialyzed against Na₂SO₄ followed by water then lyophilized. The isolated proteoglycan was added to rat chondrosarcoma (RCS) cells to observe differences in hyaluronan-mediated pericellular coat assembly caused by CD44 variants. Using the FRT-FLP recombination system, several RCS lines that express variants of CD44 were generated. Incorporation of the FRT site into parental RCS cells was maintained by zeocin selection; these cells also exhibited positive staining for beta-galactosidase activity. Several clones of FRT-RCS cells were generated by dilution cloning. The FRT-RCS cells were next double transfected with pOGG44 + pCDNA5/FRT-CD44-ecto and selected with hygromycin. Incorporation of the CD44 plasmid was also monitored by the loss of beta-galactosidase staining. When fresh medium containing 2 mg/ml aggrecan monomer was added to the parental RCS cells for 1 hour, large particle-excluding coats, up to one-cell-diameter in size, were observed. In addition, the isolated proteoglycan was used as a capture reagent to develop a modified ELISA to estimate hyaluronan amounts secreted by cells or retained in the pericellular coats (in the cell layer). This in-house ELISA also uses a biotinylated hyaluronan binding protein for the detection reagent and ARTZ hyaluronan as the standard. Surprisingly, during adipogenic differentiation of 3T3-L1 cells a copious amount of hyaluronan was made and released by the cells into the memedia. Supported in part by NIH R01-AR039507.

GP98

Knock-down of hyaluronan synthesis in chondrocytes using Adeno-shRNA and Crispr/Cas9 systems, Yi Huang, East Carolina University, Greenville, NC

Osteoarthritis is a degenerative joint disease that involves loss of extracellular matrix including hyaluronan (HA). HA in cartilage is responsible for retaining aggrecan proteoglycan within the tissue. Besides conferring resistance to compression to the tissue, HA also interacts with cell surface receptors to mediate changes in metabolism. HA is synthesized by a membrane bound

enzyme called hyaluronan synthase (HAS). Three isoforms of HAS have been identified—HAS1, HAS2 and HAS3 however, HAS2 is the isoform most active in cartilage. In addition, murine HAS2 knockout embryos die at mid-gestation, while HAS1 or HAS3 knockout mice can survive and are fertile. The goal of our project is to generate a useful HAS2 knock-down or knock-out in chondrocytes and evaluate the effect of this loss-of-function approach to define signaling pathways that are dependent on HA and critical to chondrocyte metabolism. We have designed and generated two Adeno-shRNA viruses that are currently being tested for effectiveness of HAS2 knock-down in bovine and human OA primary cultures of chondrocytes, cells that do not divide and are difficult to transfect with plasmids. We have also obtained a rat chondrocyte cell line with a stable expression of Cas9 and m-Cherry fluorescence (Dr. Gary Gibson, Henry Ford Hospital, Detroit). Guide RNA nucleotides located within exon 2 of rat HAS2 are being prepared for insertion into a green fluorescent (pSpCas9(BB)-2A-GFP) or a blue-fluorescent (pU6_gRNA_handle_U6t) gRNA-cassette plasmid. Following cloning and verification of complete knock-out of HAS2, the effects on critical phenotype markers (such as MMP13, HAS1 and HAS3) will be determined and compared to expression by the parental cell line. To verify the role of HA in these events, exogenous purified HA will be added to HAS2-knock-out chondrocytes as a rescue. Supported in part by NIH R21 AR066581-01.

GP99

Mitochondrial Capacity is Decreased in Skeletal Muscle with Estrogen Depletion, Torres, MJ^{1,2}; Gilliam LA^{1,3}; Reese RL^{1,3}; Buddo, K¹; Smith, C^{1,3}; Neufer, PD^{1,2,3}

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Menopause increases a woman's risk for developing cardiovascular disease and type-2 diabetes. Menopause coincides with a decline in ovarian hormone production, particularly 17-estradiol (E2), a key regulator of energy and glucose homeostasis. Skeletal muscle is responsible for ~80% of insulin-stimulated glucose uptake, and mitochondrial function in muscle has been linked to the control of insulin sensitivity. To examine the potential underlying mechanism(s) by which E2 regulates insulin sensitivity in skeletal muscle, young but sexually mature (12 week-old) C57BL-female mice were studied 2 weeks after ovariectomy (OVX). In permeabilized fibers from red gastrocnemius, basal complex I-supported respiration was slightly reduced ($p < 0.1$). Maximal ADP-stimulated respiration was reduced ($p < 0.05$) 17-25% with complex I plus II-, and complex IV-linked substrates in OVX compared with normally cycling females in proestrus (CTL). Expression of complex IV and V was reduced by 15-25%, and citrate synthase activity was reduced by 33%, providing evidence of a rapid decline in muscle mitochondrial content. The ratio of GSH/GSSG decreased with E2 depletion, indicative of a more oxidized redox environment. Although fasting blood glucose was elevated (43%), both oral glucose and insulin

tolerance were similar in OVX and CTLs. These findings indicate reduced skeletal muscle mitochondrial OXPHOS capacity and a shift to a more oxidized redox state develop early during acute E2 depletion, providing potential mechanism(s) by which menopause sets a pro-diabetogenic state. NIH DK096907

GP100

Transgenerational Epigenetic Reprogramming Through the Paternal Line in *Drosophila Melanogaster*, O. Williams¹, A. Ajmera², M. Pike², E. Pak¹ and A. K. Murashov¹.

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The recent increase in type II diabetes and obesity is primarily due to a sedentary lifestyle and unbalanced diet. The effects of maternal exposure to a high fat diet or malnutrition on a phenotype of offspring are supported by multiple studies. Recent observations suggest that epigenetic changes in fathers can also affect offspring metabolic phenotype. In our laboratory we investigate molecular mechanisms of transgenerational epigenetic programming through the paternal lineage. We use *Drosophila Melanogaster* as a model organism because of its powerful genetics, short life cycle, well defined developmental stages, and fast reproduction rates. In the current study we investigated effects of different diets and exercise as environmental factors on offspring metabolic phenotype. The treatment groups included control, high-fat, high-sugar, and exercise group. One-day old male flies, F0 generation, were subjected to diet or exercise regimen for 14 days. After exposure, 5 males from each group were mated with 5 virgin control females for F1 generation. The F1 generation flies was then divided into control and treatment groups and subjected to control (NutriFly), high-fat (30% coconut oil) or high-sugar (1M sucrose) diet, or exercise (1h/day) for 14 days. The metabolic phenotype of F0 and F1 generation was evaluated by measuring weight, triglyceride content, glucose and trehalose levels, motility of flies as well as endurance utilizing Vertical Test. Additionally, we analyzed F0 and F1 developmental patterns, longevity, and cardiac health. Triglyceride levels did not differ significantly in F0 fathers, but were increased in F1 exercise fathers offspring compared to fat fathers and decreased in high-fat fathers offspring compared to exercise father offspring, when maintained on high-fat diet. Trehalose levels showed increase in exercise fathers offspring compared to fat fathers offspring and fat fathers when fed high-fat diet. No difference in F1 trehalose levels was observed when offspring fed control diet. Heart rate was increased in fat fathers compared to exercise fathers after 14 days of treatment ($p < 0.014$). The preliminary results support our hypothesis that paternal epigenetic changes due to exposure to a high-fat, high-sugar diets and exercise can affect F1 generation metabolic phenotype.

GP101

Acute restraint stress alters zebra finch song performance: Potential model for evaluation of neurobiological effects of developmental stress, Tessa L Holland and Ken Soderstrom,

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During a developmental sensitive period, male zebra finches learn a complex song that is important in courtship. During early stages of vocal development they listen to and memorize an adult's song, forming a template. Later in development they gradually improve the song by practicing and using auditory feedback. In adulthood, the song has low variability and high stability. This process parallels language acquisition in humans. We are interested in the effect of psychological stress on vocal development in zebra finches. Currently, we have evaluated the effect of acute restraint stress on song performance in adult zebra finches. We hypothesized that stress would alter spectral and temporal features of the adult's song. Zebra finches ($n = 4-5$) were administered 30 minutes of restraint stress or 30 minutes of no stress, and immediately following the cessation of the stressor, they were recorded for two hours using Avisoft Recorder software. A female audience bird was paired with the recording bird as a social stimulus to promote singing. The song recordings were compared to previously obtained baseline recordings in a paired design. Sound Analysis Pro software was used to analyze songs and export spectral and temporal data for each song syllable. The song syllables of the stress group had significantly higher pitch and longer duration compared to baseline recordings (Wilcoxon signed-rank test, $p < 0.05$). The no stress group had no significant differences from baseline recordings. In a complimentary experiment, adults were administered acute restraint stress ($n = 5-6$), and following cessation of the stressor, blood was collected for corticosterone measurements as a physiological measure of stress. Brains were also collected for Golgi-Cox staining in order to evaluate changes in dendritic spine density in neural song regions. We hypothesize that the effects of acute stress on song performance will correspond to increased corticosterone levels and altered dendritic spine populations. In the future, we will evaluate the effects of concurrent developmental stress and cannabinoid CB1 receptor agonist treatment on vocal learning in order to learn more about the neurobiological consequences of stress and drug abuse on developmental-dependent learning.

GP102

Increased energy expenditure and insulin sensitivity, but not protection from obesity, in phosphatidylethanolamine methyltransferase knockout mice on long-term high-fat diet feeding, Anthony R. P. Verkerke, Christopher W. Paran, Edward J. Wentzler III, Julia E. Atkinson, Katsubiko Funai, Department of Kinesiology, East Carolina University, Greenville, NC

Increased energy expenditure can prevent diet induced obesity. Mice with a whole body knockout for phosphatidylethanolamine methyltransferase (PEMTKO) are protected from obesity induced by a short-term high-fat diet (HFD) feeding due to increased energy expenditure. However, the effects of long-term HFD feeding on body weight, energy expenditure and insulin sensitivity in these mice are unknown. We hypothesized that long-term HFD feeding will yield wildtype (WT) and PEMTKO mice that would be equally obese. WT and PEMTKO mice were placed on a 6-months HFD. Body weight, body composition, metabolic rate, food intake and spontaneous movement were measured periodically. Before mice were placed on HFD, WT and PEMTKO did not differ in any of these parameters. At 10th wk of HFD, PEMTKO mice had reduced body weight, body composition and increased energy expenditure without a decrease in food intake or an increase in activity compared to WT controls. At 20th wk of HFD, body weights between WT and PEMTKO were no longer different. After the 6-month HFD feeding, metabolic rate and glucose tolerance remained elevated in PEMTKO mice, suggesting increased energy expenditure alone promoted an increase in insulin sensitivity. In summary, elevated energy expenditure in PEMTKO mice delays weight gain induced by HFD feeding. PEMTKO mice are not protected from diet-induced obesity by long-term HFD feeding, but they remain exquisitely insulin sensitive probably due to their sustained increase in metabolic rate. Pharmacological inactivation of PEMT may be useful not only for preventing obesity, but also for promoting insulin sensitivity in the treatment of metabolic disorders.

GP103

Transglutaminase 2 and Calreticulin interact to regulate Transglutaminase 2 Transamidase Activity, Jessica Sofia Visconti, East Carolina University, Greenville, NC

Transglutaminase 2 (TG2) is a multifunctional enzyme that functions as a transamidase and GTPase. GTP and Ca²⁺ reciprocally regulate these two competing functions, where Ca²⁺ inhibits GTPase activity and GTP inhibits transamidation activity. Based on previously reported Km values for calcium and GTP, it is commonly thought that TG2 transamidating activity remains dormant since Ca²⁺ levels are low and GTP levels are high in the cell. However, dysregulation of Ca²⁺ homeostasis, a characteristic of the development of neurodegenerative diseases, will provide the appropriate conditions to activate TG2-transamidation activity thus exacerbating the formation of protein aggregates associated with these pathological states. This study aims to provide a better understanding of how Ca²⁺ regulates TG2-transamidating activity under physiological conditions, which can be extended to pathological conditions

as well.

Previous reports suggest calreticulin (CRT) is a potential protein-binding partner of TG2. CRT binds Ca²⁺ with a high capacity and low affinity; therefore, interaction with TG2 may provide the appropriate Ca²⁺-rich microenvironment to induce activation of TG2-transamidase activity. In the present study, we confirm the protein:protein interaction between TG2 and CRT in co-immunoprecipitation assays with recombinant TG2 and CRT in the absence of GDP/GTP. Furthermore, endogenous bacterial TG2 was observed to co-purify with recombinant CRT overexpressed in *E. coli*. Finally, we show that transamidation activity of TG2, in the presence of Ca²⁺, is affected by the presence of CRT. Together, the results of this study indicate that the molecular interactions between TG2 and CRT may aid in the regulation of TG2 activity by providing the appropriate calcium microenvironment for activation under physiological conditions

GP104

GPR4 Activation by Acidosis Inhibits Migration and Tubular Network Formation of Human Umbilical Vein Endothelial Cells (HUVECs), Elizabeth A. Krewson¹, Li V. Yang^{1,2}

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Angiogenesis is the growth of new blood vessel formation from existing vasculature and is critical for embryogenesis, wound healing, tumor development, invasion, and metastasis. Angiogenesis involves the activation of endothelial cells (ECs) to proliferate, migrate, and create a tubular network. Newly lined vascular ECs recruit pericytes and smooth muscle cells (SMCs), for the promotion of vascular stability and maturation. Within various disease states, vasculature becomes tortuous and disorganized partly due to acidosis and hypoxia. How the acidic microenvironment influences EC function is unclear. Proton-sensing G-protein coupled receptor 4 (GPR4) is highly expressed in ECs and is activated by protonation of histidine residues. We provide evidence supporting GPR4 activation inhibits EC migration and tubular formation. We stably transduced a construct that overexpresses GPR4 in HUVECs (HUVEC/GPR4). We performed a wound-healing assay and observed HUVEC/GPR4 cells treated with media buffered to acidic pH 6.4 inhibited migration. Within a tube formation assay, HUVEC/GPR4 cells treated under physiological pH 7.4 displayed shorter-lived tubular structures. Under acidic conditions, HUVEC/GPR4 cells did not exhibit any tube formation capabilities. Furthermore, we have orchestrated a co-culture system with HUVECs and primary coronary artery smooth muscle cells (PCASMC). This system allows us to observe the function of GPR4 in vascular stability by the recruitment of pericytes and SMCs. Under physiological pH, we have found that PCASMC promote EC tube stabilization and prolong vascular-like structure. Under acidic pH, we observed PCASMC exhibit a delayed migration to the HUVEC tubular structures.

Following treatment of HUVEC/GPR4 cells with acidic media during the co-culture system, PCASMC did not rescue or prolong the vascular structure formation. EC and pericytes interaction is critical for blood vessel formation, tumor growth, invasion and metastasis. Observing a co-culture system elucidated the key role for GPR4 as a vital component in negatively regulating angiogenesis.

GP105

The Role and Mechanism of Dietary Proteins in the Detoxification of Aflatoxin B, a Potent Hepatocarcinogen and Common Food Contaminant., Blake Rushing, Dr. Mustafa Selim, East Carolina University, Greenville, NC

Aflatoxin BI (AFBI) is a powerful hepatocarcinogen that is produced by the fungus *Aspergillus flavus* and *Aspergillus parasiticus*. This fungus and its metabolite, AFBI, is commonly found on many agricultural products, especially corn, groundnuts, and grains across the globe. Once ingested, AFBI is bioactivated in the liver by the cytochrome p450 enzyme system to an epoxide intermediate which spontaneously adducts to DNA, leading to the development of hepatocellular carcinoma (HCC). Although the extreme carcinogenic potential of AFBI has been known since the 1960s, there are no accepted detoxification methods that are in practice today. This is due to the fact that currently established methods introduce residues that are biologically harmful themselves, alter sensitive biological processes, or diminish the nutritional value of the contaminated commodity. As a result, many populations are exposed to this carcinogen with little to no alternatives.

The purpose of this study is to examine the environmental factors that favor the conversion of AFBI to AFB2a, a less toxic form of aflatoxin, and uncover further protective mechanisms of amino acids to develop safe and convenient detoxification methods that can be administered to agricultural products in high risk areas of AFBI exposure in order to reduce the development of AFBI induced HCC. In this study, we have investigated the optimum conditions for the acid catalyzed hydration of AFBI to the less toxic aflatoxin B2a (AFB2a) form in terms of treatment time, type of organic acids, and concentration of acids. Additionally, we have discovered novel covalent interactions between AFB2a and all twenty amino acids in alkaline conditions using HPLC-TOF-MS. From this data, a proposed molecular structure of the AFB2a-amino acid adduct has been determined. This information can be used to select the best protein or peptide candidate to further detoxify AFB2a and ultimately lead to an abolition of aflatoxin BI toxicity.

GP106

Selecting for an Aggressive, Consistently Metastatic Variant of the Murine Triple Negative Breast Tumor 2225L, Kassondra Balestrieri, Keith Pittman, Larisa Garkusha, Nasreen Vohra, and Kathryn Verbanac

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It is now generally accepted that a pro-tumor microenvironment, or pro-metastatic niche, in secondary tissues promotes the development of metastases. We are studying the pro-metastatic niche in triple negative breast cancer (TNBC), an aggressive cancer subtype which has a high rate of metastasis and mortality and lacks effective therapies. The murine 2225L tumor shares gene expression patterns with the human basal-like phenotype within TNBC. This study's purpose was to select for an aggressive variant of 2225L which consistently metastasizes to the lung in order to have a reliable mouse model for studies of the pro-metastatic niche. Here we report *in vivo* findings from 67 experiments, inoculating cohorts of 3-20 mice per trial. Initially, tumor fragments or dissociated 2225L cells were implanted into the mammary fat pad of syngeneic naïve Balb/c female mice ($n=10$). No metastases were observed up to 33 days later. Tumors ($n=21$) were resected in other cohorts in order to promote the growth of seeded metastases, but surgical survival was poor, local recurrences were high and no metastases were observed up to 69 days post resection (dpr). To enable clean surgical margins and improve survival, primary tumors were subsequently implanted heterotopically (sc flank). Many mice (42%; 10/22) developed lung metastases but the time to distant metastases varied greatly (1-98 dpr). We then focused on selectively passaging the most highly metastatic 2225L variants. When primary tumors from one such cohort were passaged, 67% (4/6) mice had lung metastases after primary tumor resection. When lung metastases from this same cohort were microdissected and passaged, 100% (4/4) developed lung metastases. This variant was then serially passaged in 10 different cohorts, with cells harvested from primary tumors and lung metastases. The final variant is highly metastatic with lung metastases in 95% (18/19) mice in the most recent 2 cohorts (median 28 dpr) compared to 60% lung metastases overall. To conclude, we have developed a more aggressive variant of 2225L through selective serial passaging and have developed a more reliable metastatic model of TNBC. We are passaging this variant in additional large cohorts for confirmation and will compare gene expression profiles with the original 2225L. Ongoing experiments will characterize the TNBC pro-metastatic niche by analyzing lung-infiltrating cells and chemokines. [Supported by 2014 LJCC Research and Education Fund]

GP107

Comprehension of Lexical Ambiguities in Discourse Contexts in Persons with Aphasia, Amy Henderson, East Carolina University, Greenville, NC

Previous studies have shown that persons with Broca's aphasia have difficulty processing ambiguous words which results in difficulty understanding the subordinate (less frequent) version of the ambiguous words even in sentences which bias the subordinate interpretation (e.g. Swaab, Brown, & Hagoort, 1998; Grindrod & Baum, 2003). Previously, this was thought to be a result of a difficulty in automatically accessing semantic representations of words (Millberg, Blumstein, & Dworetzky, 1987; Swinney, Zurif, and Nicol, 1989). However, more recent research has suggested that automatic access of both subordinate and dominant (more frequent) meanings is intact and that the preference for dominant interpretations occurs because of a reduced ability to use contextual information to resolve the ambiguity (e.g. Hagoort, 1993; Swaab, Brown, & Hagoort, 1998; Grindrod & Baum, 2003). A limitation of the previous work on ambiguity resolution in PWA is that nearly all of the previous studies use a lexical decision paradigm which does not require postlexical processing. Instead, researchers made inferences about postlexical processing based on varied results obtained at different interstimulus intervals. Moreover, most of the previous studies have used single sentences or even single words to provide context so little is known about how PWA use discourses to resolve ambiguity. Understanding how discourse context affects ambiguity resolution is critical for determining everyday language processing by PWA because real life settings typically require integration of the contextual information spread over multiple utterances. Finally, only a few studies (e.g. Klepousniotou & Baum, 2005) have looked at different types of ambiguities. The purpose of the current study is to examine how discourse context affects resolution of different types of ambiguities in PWA using a task that requires postlexical processing. Participants listened to four sentence discourses that biased one interpretation of the ambiguous word then judged whether or not the last sentence, which contained the ambiguous word, made sense. Preliminary data suggest that when given a robust, multi sentence context, persons with aphasia are able to resolve subordinate and dominant versions of different types of ambiguous words.

GP108

Metabolic Flexibility is Impaired in Myotubes Derived from Severely Obese Humans, James M Hinkley, East Carolina University, Greenville, NC

Severe obesity (body mass index (BMI) $> 40 \text{ kg/m}^2$) is associated with various metabolic derangements, including impaired lipid oxidation and insulin resistance. The impairments in lipid oxidation and insulin action are retained in primary skeletal muscle cells, suggesting whole body derangements in metabolism are imprinted at the level of the cell; however, it is uncertain whether alterations in metabolic flexibility (the ability to switch substrate oxidation in the face of increased supply) are also preserved. The goal of this study was to examine alterations in lipid oxidation in the face of an increased substrate supply

in vitro. To determine this, primary skeletal muscle cells were isolated from muscle biopsies obtained from lean ($\text{BMI} = 24.7 \pm 0.7 \text{ kg/m}^2$) and severely obese ($\text{BMI} = 51.5 \pm 1.8 \text{ kg/m}^2$) subjects, and differentiated into myotubes. In vitro metabolic flexibility was assessed by measuring $^{14}\text{CO}_2$ production from radiolabeled ^{14}C -oleic acid in myotubes treated for 24 hr with lipid (200 μM oleate : palmitate mixture). Treatment of myotubes with lipid induced a ~ 2.2 -fold increase in lipid oxidation in lean subjects, while the response from severely obese subjects was blunted ($\sim 66\%$). Furthermore, a negative correlation ($R = -0.62$) was evident between lipid-induced increases in substrate oxidation and BMI, revealing that as body mass increases, in vitro metabolic flexibility becomes impaired. These data show that myotubes from severely obese subjects have a decreased ability to increase oxidation in the face of excess lipid, suggesting metabolic inflexibility observed at the whole body level with these subjects is preserved in vitro.

GP109

Sepiapterin Supplementation Fails to Ameliorate Diesel Exhaust Particle Exposure-Related Erectile Dysfunction in Lewis Rats., Daniel P. Becak, Earl D. Jones, Robert M. Lust, Christopher J. Wingard, East Carolina University, Greenville, NC

Particulate exposure is ubiquitous health hazard. Diesel exhaust particles (DEPs) are of interest because of their nano-scale size, allowing for increased respiratory tract deposition, and their high rate of generation versus similar sized fossil-fuel burning engines. The exposure can cause increased inflammation and oxidative stress leading to a myriad of negative health outcomes. The increased oxidative burden can lead to vasculopathies through the oxidation of the nitric oxide synthase (NOS) cofactor, tetrahydrobiopterin (BH4) and subsequent uncoupling of the NOS complex. Previous studies have demonstrated that the erectile vasculature becomes dysfunctional prior to the coronary vasculature when exposed to various insults. We hypothesized that: 1) Exposure to DEPs would induce erectile and coronary vascular dysfunction. 2) The erectile dysfunction would manifest prior to coronary vascular dysfunction in a model of repeated exposure. 3) Increasing bioavailability of BH4 through sepiapterin supplementation would ameliorate DEP-induced vasculopathies. Erectile function in anesthetized young (14 weeks old; n=12) and 3 groups of DEP-exposed (14 weeks old; n=3) male Lewis rats was assessed *in situ* by measuring the maximum intracavernosal pressure (ICP) and mean arterial pressure (MAP) in response to electrical field stimulation (EFS, 0- 6 volts) of the cavernosal nerve. DEP exposed groups were exposed 1, 2, or 3 times with a week between each exposure of 125 μg DEP in 200 μl sterile saline. Sacrifice occurred 24 hours after the final exposure. We assessed the erectile responses before and after intracavernosal injection of 10 μM sepiapterin, a BH4 precursor. The maximum ICP response to EFS was markedly decreased in the 1 and 3x exposure groups ($39.85 \pm 8.52 \text{ mmHg}$, $31.74 \pm 10.3 \text{ mmHg}$), but not the 2x exposure group ($56.84 \pm 0.46 \text{ mmHg}$) versus control (49.67 ± 3.58

mmHg). Likewise, there was a shift in the EV50 in the 1x and 3x groups (3.6 ± 0.19 V, 3.16 ± 0.05 V) versus the 2x (2.82 ± 0.21 V) and the control (2.7 ± 0.17 V). Sepiapterin failed to ameliorate this dysfunction.

GP110

Accelerated Nucleotide Degradation induces atrophy in muscle,

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Skeletal muscle atrophy is characterized by increased rates of protein degradation and net loss of protein. Unfortunately, there are no suitable pharmaceutical treatments for atrophy. The expression of AMP Deaminase 3 (AMPD3: AMP → IMP + NH₃), which degrades high-energy adenine nucleotides, is increased up to 100-fold during atrophy, but surprisingly its function in atrophy is unknown. The purpose of this study was to determine if increased AMPD3 expression alone would accelerate protein degradation and thus initiate muscle atrophy. Methods: C2C12 myotubes were infected with adenoviruses encoding AMPD3 or GFP.

Protein degradation and protein synthesis rates were determined by the pulse-chase of ³H-tyrosine. Total AMPD activity (IMP formation) and nucleotide (ATP, ADP, AMP, and IMP) content were measured in cell homogenates by UPLC. Results: AMPD3 overexpression for 24 h significantly increased AMPD activity and [IMP], demonstrating a sustained mismatch between energy supply and demand. Degradation rate of long-lived proteins was greater in AMPD3 (1.17%/hr) vs GFP controls (0.85%/hr) ($p < 0.01$), while protein synthesis rate remained unchanged. The accelerated proteolysis rate was entirely sufficient to explain the 15% lower ($p < 0.01$) total protein content in AMPD3 infected myotubes.

Conclusions: These data demonstrate that AMPD3 overexpression in muscle creates an energetic imbalance and initiates atrophy through increased proteolysis. Therefore, our data implicate AMPD3 and perhaps cellular energetics as promising targets for new treatments of atrophy.

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insulin sensitivity. However, it is not clear how physical activity and natural compounds modify molecular mechanisms on human skeletal muscle cells from lean and severely obese individuals. We investigate glucose metabolism and insulin signaling pathway in human skeletal muscle myotubes in response to electrical muscle contraction mimicking physical exercise and an antioxidant supplement, resveratrol produced by plants. Human skeletal muscle myotubes were contracted by applying electrical pulse stimulator for 24 hours while the myotubes were incubated with resveratrol for 24 hours. Muscle contraction increased insulin-stimulated glycogen synthesis in skeletal muscle cells from both lean and obese individuals while glycogen synthesis was increased in response to resveratrol in cells from lean but not obese individuals. In addition, muscle contraction and resveratrol improved phosphorylation of IRS-1Tyr612, AktSer473 and ASI60Thr642, key molecules of insulin signaling, in human skeletal muscle myotubes from lean individuals but not obese compartments. Our findings demonstrate that electrical stimulation and resveratrol improved glycogen synthesis and insulin signaling in human skeletal muscle myotubes from lean people. However, our data show that those health benefits induced by electrical stimulation and resveratrol were blunted in skeletal muscle myotubes from obese individuals.

GP111

Electrical pulse stimulation and resveratrol can enhance glucose

**metabolism in human skeletal muscle myotubes, Sanghee Park,
Taylor Beasley, Kristen Turner, Donghai Zheng, Chuck Tanner, Joe Hounard, East
Carolina University, Greenville, NC**

Obesity is a world-wide health concern because of its close association with insulin resistance, type 2 diabetes, and cardiovascular disease. Physical activity and natural compounds not only give a variety of health benefit but also significantly enhance

GP112

The Role of ftz-fI in the Drosophila Ovary, *Amelia Jean Helms, East Carolina University, Greenville, NC*

Stem cells are pluripotent cells within the body that have the innate ability to turn into multiple types of mature cells. They serve a critical role in proper organ function, and many medical research projects focus on harnessing the power of the stem cell to improve current medical treatments. Basic research into the mechanisms behind the behavior of stem cells will aid understanding of biology as well as help focus translational application of regenerative therapies. The *Drosophila melanogaster* (fruit fly) ovary provides a unique model system to study stem cell behavior within living tissue. These organs contain two distinct well characterized populations of stem cells: germ line stem cells (GSCs), which give rise to oocytes, and somatic follicle stem cells (FSCs) which form the structural units of the fly gonad. The insect steroid hormone ecdysone (analogous to human steroid hormones like estrogen and testosterone) has been clearly shown to impact tissue remodeling during metamorphosis as insects transition between different life stages. Similarly, ecdysone signaling affects stem cell fate within the adult *Drosophila* ovary. However, the precise signaling pathway and gene regulation has not been clearly elucidated. Competence factors are molecules or genes which enable a cell to properly receive and respond to an external signal. Nuclear hormone receptor ftz transcription factor I (ftz-fI) has been shown to be a competence factor for ecdysone signaling during metamorphosis. Currently its role in the ovary is unknown. Preliminary data reveals that loss of function mutations create complex ovary phenotypes, which affect both somatic and reproductive cell lineages, including stem cells and their progeny. Ftz-fI is evolutionarily highly conserved; direct homologues are found in humans (members of the LRH and NRA receptor family). Ftz-fI may have similar targets and mechanisms in its role as a competence factor when compared to the human homologues, and thus may regulate steroid hormone competence in human stem cells in a comparable manner. Consequently, further study of the cellular mechanisms controlled by ftz-fI may provide therapeutic or pharmaceutical targets for stem cell fate determination in humans.

GP113

Dual Roles of claudin-7 in human lung cancer cell growth and metastasis, *Do Hyung Kim¹, Zhe Lu¹, Qun Lu^{1,2}, Michael Shear¹, Yan-Hua Chen^{1,2}, ¹Department of Anatomy and Cell Biology, ²Leo Jenkins Cancer Center, Brody School of Medicine, East Carolina University, Greenville, NC*

Claudins are a family of tight junction (TJ) membrane proteins involved in a broad spectrum of human diseases including lung cancer. We found that claudin-7 is a unique TJ membrane protein in that it has a stronger expression at the basolateral side of the membrane than at the apical side in lung cancer cells. To investigate the function of claudin-7 in lung cancer, we suppressed claudin-7 expression in HCC827 human lung adenocarcinoma cells using lentivirus shRNA technology. Suppression of claudin-7 expression in HCC827 cells (KD cells) greatly increased the rate of cell proliferation. The phospho-ERK1/2, phospho-Bcl-2, and survivin were all upregulated in KD cells. In addition,

these claudin-7-suppressed KD cells showed a significantly reduced expression level of integrin I and focal adhesion kinase (FAK). The functional analysis revealed that the cell attachment, cell migration, and cell invasion capabilities were all decreased in KD cells compared to those of control cells. The defect in cell attachment is most likely mediated through the integrin I signaling pathway since FAK is a downstream target of integrin I and its expression is regulated by integrin I. However, transfection of integrin I cDNA into KD cells (I-reexpressed KD cells) did not fully restore the cell attachment defect. Only after transfection of claudin-7 back to KD and integrin I-reexpressed KD cells, did the expression level of focal adhesion proteins increase and the cell attachment function restore. We conclude that claudin-7 plays dual roles in both lung cancer cell growth and cell-matrix adhesion in human lung cancer cells. This study was supported by National Institute of Health grants ES016888 and HL085752.

GP114

Dopamine DI and D3 receptor interactions with morphine in an animal model of Restless Legs Syndrome (RLS), *Alexander P. Yllanes¹, Sophia Samir¹, Kori Brewer², and Stefan Clemens¹*

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Restless Legs Syndrome (RLS) involves abnormal limb sensations that diminish with motor activity, worsen at rest, and can severely disrupt sleep. Primary treatment is directed at CNS dopaminergic systems, particularly activation of D2-like (D2, D3 D4) receptors, however long-term therapy can lead to augmentation, a switch of initially beneficial therapeutic actions into adverse effects and a subsequent worsening of symptoms.

Our lab recently reported that a dysfunction of the D3 receptor (D3R) system was associated with a lack of responsiveness to morphine and an increase in DI receptor (DIR) protein levels in the spinal cord. Based on these and data from other labs that point to a role of the DIR in controlling locomotor output in other movement disorders, we hypothesized that a modulation of the DIR system will provide a novel means by which to prevent the development of D3R agonist-induced augmentation and lack of responsiveness to morphine.

We tested thermal pain withdrawal latencies over the life span of wild type (WT) and D3R knockout mice (D3KO) with varying dosages and/or combinations of morphine and DI antagonist. After establishing baseline withdrawal latencies, animals were treated with i.p. injections of saline control, morphine (2 mg/kg and 5 mg/kg respectively), DIR antagonist (0.1 mg/kg), and morphine-DI antagonist combinations (2 mg/kg + 0.1 mg/kg; 5 mg/kg + 0.1 mg/kg).

We found that morphine was effective in extending pain withdrawal latencies at both concentrations tested and in both young and old WT animals, but that low morphine had no effect on its own in

D3KO at either age. In contrast, high morphine increased latencies in young and old but not middle-aged D3KO albeit to a lesser extent than in WT. Blocking DIRs did not alter responses in WT, but increased latencies in young D3KO only. Further, the combination treatment of DIR antagonists and low morphine increase latencies in young and old WT, but only in young D3KO. Lastly, the combination treatment of DIR antagonists and high morphine was efficient in WT and young and middle-aged D3KOs.

These data suggest that DI-D3 receptor interaction mediate morphine responsiveness, and that blocking DIRs can restore opioid sensitivity, including in an animal model of RLS with compromised D3R function.

GP115

Protein Kinase G and VASP in the Control of Vascular Smooth Muscle Cell Migration, *Andrew Holt, Joshua Stone, David Tullis, East Carolina University, Greenville, NC*

Uncontrolled migration of vascular smooth muscle cells (VSMCs) is a mechanistic foundation of cardiovascular disease, the number one killer of Americans and individuals worldwide. Unfortunately, current strategies aimed at preventing pathologic VSMC migration are largely inefficient. This study was designed to characterize a potential novel target capable of controlling VSMC migration, and our hypothesis is that protein kinase G (PKG)-stimulated vasodilator-activated serum phosphoprotein (VASP) serves to inhibit VSMC migration through enhanced actin polymerization and increased cytoskeletal stability. In human primary and rat commercial VSMCs, using pharmacologic and mechanical stimulation, as well as a newly developed confocal and laser capture microdissection-assisted migration assay, results show that PKG phosphorylates VASP at Ser239, a reported PKG-sensitive site, and that this correlates with reduced globular to filamentous actin (G:F), and inhibited cell migration. In complement, using a rat carotid artery injury model, PKG activation and subsequent VASP activation significantly diminished neointima formation and vascular wall remodeling. These findings suggest that vascular protection can be accomplished through PKG and downstream phosphorylation of the actin binding protein VASP, which may serve to increase cytoskeletal stability and offset the capacity of VSMCs to migrate as an underpinning of abnormal cell migration during cardiovascular disease.

GP116

HTLV-I basic leucine zipper factor (HBZ) interacts with small Maf transcription factors, *Amanda Williams Rushing, Isabelle Lemasson, East Carolina University, Greenville, NC*

Human T-cell Lymphotropic Virus Type I (HTLV-I) is a human retrovirus and etiologic agent of Adult T-cell Leukemia (ATL), a malignancy involving the transformation of infected CD4+ T-cells after an extended period of viral latency. Currently, the mechanisms by which HTLV-I mediated transformation occurs remain unclear. ATL cells are known to express two viral regulatory proteins, Transactivator X (Tax) and the antisense-encoded HTLV-I basic leucine zipper factor (HBZ), suggesting that these two proteins play key roles in oncogenesis. Tax is a transcriptional regulator believed to upregulate viral gene expression through transactivation of the 3' long terminal repeat (LTR). Though it has been shown to be essential for the initial transformation of infected CD4+ T-cells, the expression of Tax is only maintained in about 40% of ATL cells, indicating that this protein alone is not entirely responsible for the transition to a malignant state. Conversely, HBZ has been found to be expressed in all ATL cells, regardless of Tax expression, supporting its importance for HTLV-I mediated oncogenesis. However, the exact role HBZ plays in the development of ATL remains unclear. When overexpressed during in vitro experiments, HBZ promotes cellular proliferation and enhances cellular migration. In addition, HBZ interacts with and modulates the functions of several cellular transcriptional regulators including members of the CREB/ATF and AP-1 families. Recent liquid chromatography tandem mass spectrometry analysis has provided evidence that HBZ interacts with a number of other cellular factors which may prove to have serious implications in HTLV-I mediated carcinogens. One such group of HBZ-interacting proteins identified was the small Maf protein family (MafF, MafG, and MafK), a group of transcription factors characterized by a highly conserved basic leucine zipper domain. Members of this family have been shown to homodimerize or heterodimerize with other members of the Cap n' Collar (CNC) protein family to facilitate its interaction with the DNA at specific Maf recognition elements (MAREs) to either promote or repress transcription. Interestingly, these proteins have been shown to play roles in the regulation of development as well as the hypoxic response, providing two potential mechanisms through which altered activity of small Mafs could contribute to oncogenesis. Here, we discuss our progress in confirming and characterizing the interactions between HBZ.

GP117

Optimizing Oxidative Phosphorylation by Manipulating Mitochondrial Cardiolipin Levels, *E. Madison Sullivan, Dr. David A. Brown, Dr. Tonya N. Zeczyki, Dr. Saame Raza Shaikh, East Carolina University, Greenville, NC*

Type 2 diabetes (T2D) and cardiovascular disease (CD) are two leading causes of death in the United States. Although a need for new therapies is apparent, the lack of knowledge on the underlying mechanisms behind these diseases is a major limitation in the development of new therapies. One mechanism being investigated is the role of mitochondrial dysfunction in T2D and CD. Mitochondrial dysfunction can occur through the disturbance of inner mitochondrial membrane (IMM) phospholipids and their interaction with membrane proteins. Enzyme complexes and supercomplexes involved in oxidative phosphorylation (OX PHOS) are located in the IMM and have a high affinity to cardiolipin (CL). Cardiolipin is a unique phospholipid predominately found in the IMM and its mass is decreased in T2D and CD. Our lab is testing the hypothesis that cardiolipin levels regulate mitochondrial membrane fluidity and disrupt the formation of supercomplexes and the activities of the complexes in the OX PHOS pathway.

To determine the importance of CL levels to OX PHOS activity, we manipulated CL or dioleoylphosphatidylcholine (DOPC) levels in cardiac mitochondrial membranes. Our approach relied on fusing small unilamellar vesicles, composed of either 100% CL or 100% DOPC, to isolated cardiac mitochondria. Thin layer chromatography confirmed phospholipid incorporation. Kinetic assays were used to characterize the specific activities of each enzyme complex and the combined activity of two enzyme complexes within the OX PHOS pathway. Our results show that fusion with CL or DOPC leads to a 2-6 fold reduction in complex I, II and IV activity. Complex III activity was unaffected by increased CL levels. An increase in CL and DOPC also had a detrimental effect on the combined activities of complexes I+III and II+III. Contrary to our hypothesis, these preliminary data suggests that a balance of phospholipids is needed in the IMM for optimal OX PHOS activity. Our lab is continuing to investigate the relationship between CL and OX PHOS in order to understand how decreased amounts of CL and T2D and CD are linked. Currently, progress is underway to measure distances between complexes within supercomplexes in healthy and diseased cardiac tissue using forster's resonance energy transfer (FRET) microscopy. Altogether, it is important to understand the relationship between CL and OX PHOS in order to design more specific therapies to combat T2D and CD.

GP118

Host specific expression and intracellular localization of the Vaccinia virus OI protein, *Anastasia C. Weeks, Gwendolyn B. Jones, Shayna Mooney, and Rachel L. Roper, East Carolina University, Greenville, NC*

Poxviruses cause a number of mammalian diseases, and several poxviruses are emerging as human pathogens worldwide. Smallpox was successfully eradicated from nature by the Vaccinia virus (VACV) vaccine, and VACV is currently used successfully as a vector in recombinant vaccines that target diseases such as HIV, malaria and cancer. However, VACV retains significant virulence in

mammals and is unsafe for approximately 25% of the US population. In order to understand poxvirus pathogenesis, our lab is investigating poxvirus virulence genes.

To investigate the function of the VACV OIL gene, we selected two OIL peptide sequences as targets to generate rabbit anti-OIL sera for detection of the OI protein. To test the specificity of our anti-OI sera, we performed immunoblot analysis of lysates from cells infected with the wild-type VACV Western Reserve strain (WR) or the ΔOIL mutants generated by our lab. We determined that the anti-OI sera do indeed detect the OI protein, and confirmed the absence of OI in the ΔOIL mutants. We detected OI at a higher MW than the predicted 78 kD, suggesting some protein modification of OI. Interestingly, some software algorithms predict that OIL encodes a nuclear localization signal, which could be important for OI function or a target for post-translational modification. Of additional import, recent bioinformatics analyses have indicated that OI may be uniquely important for poxviral pathogenesis in humans. Therefore, we used BSC-I (monkey) and HeLa (human) cells for immunoblot analysis of subcellular fractions. In HeLa cells, the OI band was enhanced compared with OI from BSC-I cells. We also detected OI in both cytoplasmic and nuclear fractions. To confirm localization, we used immunofluorescence microscopy to visualize the location of OI in WR-infected HeLa cells. Preliminary results indicate some punctate cytoplasmic staining, which is suggestive of endosomal localization. Intra-nuclear staining was also observed, and is under further investigation.

The presence of a VACV protein in the nuclear fraction is unusual for poxviruses, which replicate in the cytoplasm, unlike all other DNA viruses. Determining where OI is functioning within the host cell could provide insight into the novel virulence mechanisms of OI, which may aid in the development of safer, more immunogenic VACV vaccines.

GP119

Role of microglia activation in nicotine induced sensitization to cocaine., *Partha Sarathi Nagechowdhuri, Brian McMillen, Helen Williams, East Carolina University, Greenville, NC*

Nicotine use during adolescence is considered to be a 'gateway' that leads to the brain's sensitization to other illicit substances in the future. Psychoactive drugs such as nicotine are known to induce the expression of the transcription factor FosB which facilitates this sensitization process. Previous studies have shown that a once daily, 10-day administration of nicotine during periadolescence in rats (PND 35-44) induced the expression of FosB in the memory and reward subset of the rat brain, and this expression persisted into adulthood (PND 80) (Soderstrom et al. 2007). In our study, we attempt to elucidate the role of microglia in this sensitization process. Furthermore we want to know if there are cross-talks between microglia activation, FosB induction, and the rat's cross-sensitization to cocaine at adulthood. We hypothesize that nicotine's induction of FosB is dependent on microglia activation, and that both FosB and microglia activation contribute to the animal's preference for cocaine at adulthood. So far, we have demonstrated that microglia suppression with minocycline

pretreatment at an intraperitoneal (i.p.) dose of 30 mg/kg prior to nicotine administration during the 10-day period significantly reduced the density of FosB-labeled cells in the dentate gyrus of the hippocampus. Ongoing studies in lab are focused on understanding whether microglia suppression reduces the rat's cross-sensitization to cocaine at adulthood.

GP120

Hypoxia Inhibits N6 methyladenosine formation in mRNA,
*Nate Fry, Kyle D. Mansfield, Department of Biochemistry and Molecular Biology,
Brody School of Medicine, East Carolina University, Greenville, NC*

Transcription and translation pathways have been well-studied, and their importance to gene expression is well understood. The importance of post-transcriptional regulation, however, is still not widely appreciated, nor well understood. One post-transcriptional pathway, mRNA degradation, has been a focus of our lab as mRNA stability can have dramatic effects on gene expression levels in response to a variety of conditions. Recently our lab has discovered that hypoxia, a condition known to play a role in tumor growth and angiogenesis, as well as heart disease and stroke, leads to an increase in the stability of a subset of ischemia related mRNAs. Identifying the underlying mechanisms behind mRNA stability has been difficult because many factors, including RNA binding proteins and miRNAs have been found to play a role in regulating mRNA stability. Recently, however, the mRNA modification

N6 methyladenosine has been shown target mRNAs for degradation. N6 methyladenosine containing mRNA is bound by YTHD Family of RNA binding proteins which then transport the methylated mRNA to processing bodies where storage and degradation of mRNA occurs. Interestingly, our data suggests that N6 methyladenosine mRNA levels are decreased under hypoxic conditions. We hypothesize that this decrease in mRNA methylation plays a role in increasing mRNA stability under hypoxic conditions, possibly through the increased expression of a known N6 methyladenosine mRNA demethylase, ALKBH5. As such, ALKBH5 represents a potential therapeutic target for treatment of cancer as well as side effects from heart and muscle ischemia.

GP122

Home-school partnerships, *Heather R Miller, East Carolina University,
Greenville, NC*

Studying home-school partnerships is important to research as it has the ability to provide a better understanding of how effective parent-teacher relationships are established, as well as how continuity in education between the home and school environment is able to enhance learning outcomes for students with autism. The number of students with Autism Spectrum Disorder (ASD) continues to increase, with current statistics demonstrating that 1 in every 68 children are diagnosed with the disorder (Autism Society of America, 2012) and the use of assistive technology has been widely recommended by the Council for Exceptional Children (CEC), Division of Early Childhood (DEC) as an appropriate intervention strategy to use especially with children who have autism spectrum disorders (ASD). This research study focuses on the importance of continuity in communication, interaction and instruction between parents and teachers in regards to student learning outcomes through training and implementation of the online assistive technology program. Teachers and students enrolled in self-contained classrooms within the public school system representing preschool, elementary, middle and high school programs ($n=16$) were randomly selected as participants. A random sample of parents ($n=4$) representing each classroom type were selected and trained to implement the program at home. The outcomes from the study will be presented.

GP121

PRESENTATION WITHDRAWN

GP123

The Impact of Unemployment on Enrollment in the North Carolina Community College System, Natasha Molet Worthington, Erica Schatz, Whitney Morris, Nurah Al-Dayel, Doctoral Students, Department of Educational Leadership, Higher Education Concentration, East Carolina University, Greenville, NC

The community college is “uniquely American” (Boggs, 2003, p. 16), very different from the system of universities in the United States (U.S.), or elsewhere in the world. As community colleges exist to serve the communities in which they are located, they have unique purposes that come with their own set of distinct issues. One such issue is that of the impact of the local job market on enrollment. Time has proven that local market conditions, including unemployment, impacts many, and influences decisions of local citizens and organizations. In response to the uncertainty of market conditions, community colleges constantly make changes to their curriculum and programs to ensure the needs of the citizens in their service areas are met.

The purpose of this research study was to determine if there was a relationship between unemployment rates in NC from 2002-2011 and enrollment in the NCCCS during those same years. We used fall enrollment data from each of the 58 community colleges in the state, based on the institution's fall enrollment, as of October 15 of the reporting year. For the years 2002 through 2011, institutional enrollment was pulled for each institution each year; the data was divided by gender (male, female), race (Black, White, Hispanic), enrollment status (full-time vs part-time), and educational status (degree seeking vs non-degree seeking). Employment data for NC was pulled from the North Carolina Department of Commerce's Labor and Economic Analysis Division's Demand Driven Data Delivery (NCDC LEAD) System. The system allowed unadjusted, original unemployment percentages to be pulled for the years 2002-2011.

The data revealed that there is a strong link between unemployment and community college enrollment. It was found that unemployment rates in NC and enrollment within the NCCCS are strongly linked. In addition to total enrollments, there are differences by gender, race, educational status, and enrollment status. The finding that unemployment rates have a positive and significant correlation with all enrollment groups shows that there is a link across enrollment subsets, and that unemployment may have an impact on all groups deciding to further their education.

GP124

Senior Games: Students' Community Outreach with Older Adults, Tiesha Martin, Stacy Warner, Bhibba M. Das, Department of Kinesiology, East Carolina University, Greenville, NC

Sport is a tool that can engage people, both young and old in physical activity; however, sport is often only seen as an activity that the younger population can benefit from. As the older adult population continues to increase, there is a need to create a greater awareness of the older adult sport experience and to debunk negative stereotypes associated with older adults participating in sports. While the service-learning literature suggests that service-learning can improve students' diversity and political awareness, challenge negative stereotypes and contribute to student academic success, there is limited research assessing the outcomes of service-learning for Kinesiology students working with older adults in a sport setting. Thus, the purpose of this study was to explore the outcomes and perceptions of a service-based learning experience with older adults participating in the North Carolina Senior Games. In doing so, this study provides insight that will aid in better preparing students to work with older adults.

For this study, students enrolled in a physical activity and aging course were asked to volunteer at the Greenville-Pitt County Senior Games and write a reflection about their personal experience working with older adults and things they observed. The written reflections from 58 students were used as primary data for the study. Open coding was used to analyze the data.

Three major themes emerged from data analysis: Students' Change in Perception, Humanizing the Older Adult Experience, and Learning by Doing. The results revealed that student' perceptions about older adults' physical abilities and competitiveness and their view of sport changed as a result of the service-learning experience. In addition, students bonded with the older adult participants and gained a new appreciation for service. Finally, students gained a better understanding of the course content as a result of the service experience and were able to perform professional tasks.

This research suggests that service-learning can help challenge stereotypes regarding older adults' participation in sport and contribute to student academic and professional development.



ON1

Flux through fatty-acid oxidation alters redox state in muscle,
Cody D. Smith, Chien-Te Lin, Lauren R. Reese, Cheryl A. Smith, Irwin J. Kurland, and P. Darrell Neufer, East Carolina University and Albert Einstein College of Medicine, USA

Accumulation of myocellular lipid intermediates due to lipid overload and incomplete mitochondrial fatty acid oxidation (FAO) have been associated with insulin resistance in muscle. Based on these findings it has been suggested that therapeutic acceleration of FAO might alleviate insulin resistance. According to principles of mitochondrial bioenergetics, accelerating FAO, in the absence of energetic demand, will increase the reducing pressure within the electron transport system (ETS) and subsequently increase the rate of mitochondrial H₂O₂ production, a factor known to cause insulin resistance. Muscle-specific transgenic peroxisome proliferator-activated receptor-(MCKPPAR) mice are characterized by elevated rates of FAO and reduced glucose tolerance and insulin sensitivity. Permeabilized muscle fiber bundles (PmFbs) prepared from the white gastrocnemii of MCKPPAR mice had elevated rates of state 4 respiration (JO₂) supported solely by fatty acid substrates compared to wild-type (WT) controls (28.5 ± 2.1 vs. 12.9 ± 0.8 pmol O₂/sec/mg dry wt; mean \pm SEM; $p < 0.001$) as well as elevated mitochondrial membrane potential (m) measured simultaneously (-149.7 ± 1.7 vs. -124.0 ± 5.0 mV; $p < 0.001$), suggesting increased reducing pressure within the ETS. Consistent with elevated m and in parallel experiments, PmFbs from MCKPPAR muscle had increased rates of H₂O₂ production compared to WT (10.4 ± 0.7 vs. 5.8 ± 1.0 pmol/min/mg dry wt; $p < 0.01$). In PmFbs prepared from homozygous fatty-liver dystrophy (fld) mouse muscle, another model of accelerated FAO in skeletal muscle and insulin resistance, state 4 lipid-supported JO₂ and H₂O₂ production were elevated compared to controls as well ($p < 0.05$ and $p < 0.001$, respectively). Taken together, these data suggest elevated FAO flux increases mitochondrial reducing pressure and H₂O₂ production, consistent with H₂O₂ induced oxidative shifts in cellular redox state linked to high-fat diet induced insulin resistance. NIH DK096907

ON2

Transport and Fate of Pharmaceuticals and Personal Care Products (PPCPs) In Coastal Plain Soils,
Beau Davis Benfield, East Carolina University, Greenville, NC

Knowledge on the transport and fate of pharmaceuticals and personal care products (PPCPs) in terrestrial and aquatic ecosystems is pertinent to conserving the integrity of these environments. PPCPs consist of a diverse set of xenobiotics, and are classified by environmental scientist with respect to their intended type of usage. These compounds are persistently introduced to the environment through anthropogenic processes such as wastewater effluent and agribusiness. Although recent literature characterizes PPCPs as "emerging" contaminants, they have likely been present in the

environment for decades.

Advances in analytical technology have provided data that underscores the ubiquity of PPCPs in aquatic ecosystems. Previous research has shown that soil parameters, such as organic matter content and microbial activity, can attenuate PPCPs via sorption and degradation. However, few studies have examined the transport of PPCPs through soils typical of coastal environments. These regions may be at greater risk for surficial PPCP transport due to permeable soils and high water tables. The purpose of this study is to examine the effect that grain size, organic matter and microbial activity have on the sorption and degradation of selected PPCPs in shallow coastal plain sediments. Data from this study can be used to decrease the prevalence of PPCPs in aquatic ecosystems.

ON3

The Prophecy Series: Modernism vs. Renaissance,
Dazzala Cofield, East Carolina University, Greenville, NC

The investigation I am undertaking relates to a series of paintings that I am creating. These paintings emphasize modernism and the use of Christian and Renaissance themes. My desire is to produce a body of paintings that shows the influence of modernism and takes spiritual dreams and visions and brings them to life on canvas.

The investigation is set up in several steps. The first step relies on heavy research of Renaissance work and also different Christian themes. This is important to me because I want to create reawakening with the arts and to discover the themes are embedded in our subconscious. After the death of my mother, I discovered a spiritual awakening in me. This life changing event propelled me to learn explore spiritual themes and Christian concepts. When I discovered this, a door was open to visions and dreams. Secondly, I decided to merge these themes together to create a modern version of Renaissance art and explore the works of Michelangelo. I had an opportunity to travel to Italy. I saw first-hand the power of these works and how visually they awakened the soul.

Thirdly, I examined modern art and look at the works of art by Sigmar Polke and his use of muted tones and geometric shapes. These shapes in his work resemble a fragmented cross to me. I am researching how to create works that merge the boldness of modernism to the spiritual themes that reflect the dynamic expression of the Renaissance.

ON4

Performance Funding & the North Carolina Community College System,
Angela Jo Wall, Brandon Jenkins, East Carolina University, Greenville, NC

The purpose of the present study is to evaluate recent changes to the North Carolina Community College System's (NCCCS) performance funding model and assess its ability to fairly and equally distribute

funding allocations across the system's 58 institutions. In particular, this study will evaluate institutions ability to meet performance measures in two specific areas: 1) first year progression and 2) licensure and certification passing rates. While evaluating these performance measures, this study will attempt to account for differences in individual institutions enrollment, as well as the rural or urban classification, economic status, and minority population of the institutions primary county of service. Finally, this study will discuss the implications for future performance funding growth and implementation across the NCCCS and the need for greater research.

ON5

**Morphological Analysis Perspective (MAP) - An application of General Morphological Analysis (GMA) to software engineering project management, Roger D Moore,
East Carolina University, Greenville, NC**

Software engineering project management has been defined as the application of procedures, practices, technologies, and know how that provides the planning, organizing, staffing, directing, and controlling necessary to successfully manage an software engineering project (Thayer, 2000).The project manager, according to The Software Engineering Body of Knowledge Version 3.0, also has to coordinate the activities within fifteen knowledge areas and seven related disciplines. This makes software engineering project management a complex multidimensional management problem. Multidimensional management problems present a unique set of issues that require specific management techniques and perspectives. General Morphological Analysis (GMA) is a method for identifying and investigating the total set of possible relationships or options contained in a given complex multidimensional problem. GMA facilitates the analysis of complex multidimensional problems. Morphological Analysis Perspective (MAP) is the application of GMA to Software Engineering Project Management. This study presents the Morphological Analysis Perspective (MAP) and explores its use as a tool for software engineering projects that enables the visualization of the total problem set and facilitates the reduction of a large total problem set to a smaller manageable solution set. The hypothesis presented at the Research and Creative Achievement Week is that the MAP provides a more efficient perspective for managing software engineering projects in corporations.

ON6

Persistent Cardiac Ischemia Reperfusion Injury Following Intratracheal Instillation of 20 nm Citrate Capped Nanosilver, Nathan A Holland¹, Daniel P. Becak¹, J. H. Shanahan², J. M. Brown², Sarah A. Carratt³, Laura S. Van Winkle³, Kent E. Pinkerton³, Susan J. Sumner⁵, Timothy R. Fennell³, R. M. Lust¹, and C. J. Wingard¹,

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Background: Silver nanoparticles (AgNP) have garnered much interest due to their antimicrobial properties, becoming one of the most utilized nano scale materials. However, any potential evocable cardiovascular injury associated with exposure has not been previously investigated. We have demonstrated expansion of myocardial infarction after intratracheal (IT) instillation of other nanomaterials. We hypothesized that pulmonary exposure to Ag core AgNP induces persistent increase in circulating cytokines, expansion of cardiac ischemia-reperfusion (I/R) injury associated with altered coronary vessel reactivity.

Methods: Male Sprague-Dawley rats were exposed to 200 µg of 20 nm citrate capped Ag core AgNP, or a citrate vehicle intratracheally (IT). One and 7 days following IT instillation lungs were evaluated for inflammation and silver presence, serum was analyzed for concentrations of selected cytokines, and cardiac I/R injury and coronary artery reactivity was assessed.

Results: AgNP instillation resulted in modest pulmonary injury with detection of silver in lung tissue and infiltrating cells, elevation of serum cytokines: G-CSF, MIP-1, IL-1, IL-2, IL-6, IL-13, IL-10, IL-18, IL-17, TNF, and RANTES, expansion of I/R injury and depression of the coronary vessel reactivity and 1 day post IT compared to vehicle treated rats. Seven days post IT instillation was associated with persistent detection of silver in lungs, elevation in cytokines: IL-2, IL-13, and TNF and expansion of I/R injury.

Conclusions: Based on these data, IT instillation of AgNP increases circulating levels of several cytokines, which may contribute to persistent expansion of I/R injury possibly through an impaired vascular responsiveness.

PP1

Estrogen Receptor ER Plays a Major Role in Oxidative Stress Dependent Myocardial Dysfunction Caused by Ethanol in Conscious Female Rats, Fanrong Yao, East Carolina University, Greenville, NC

Our recent studies show that ethanol elicited nongenomic estrogen (E2)-dependent myocardial oxidative stress and dysfunction in female rats. The aim of this study was to elucidate the role of the individual E2 receptors (ERs), ER, ER, and the G protein-coupled estrogen receptor-I (GPER), in the ethanol-evoked myocardial oxidative stress and depression. To achieve this goal, female rats in proestrus phase received selective antagonist (200 μ g/kg; i.v) of ER (MPP), ER (PHTPP) or GPER (GI5) or saline 30 min before ethanol (1g/kg; i.v) or saline infusion. ER blockade virtually abrogated ethanol-evoked myocardial dysfunction and hypotension, while ER blockade had no effect on the hypotensive response but caused delayed attenuation of the ethanol-evoked reductions in left ventricular developed pressure and the rate of left ventricle pressure rise. GPER blockade caused delayed attenuation of both cardiovascular effects of ethanol, and exacerbated ethanol-evoked tachycardia. While all 3 ERs subtype antagonists attenuated the ethanol-evoked increases in myocardial catalase and ALDH2 activities, MPP was the only antagonist that inhibited myocardial catalase activity. All 3 antagonists abrogated ethanol-evoked enhancement of myocardial Akt, ERK1/2, P38, eNOS and nNOS phosphorylation, except for a lack of effect of PHTPP on p38, and MPP on Akt and nNOS phosphorylation. And all 3 antagonists abrogated ethanol-evoked of myocardial nitrite/nitrate level. Finally, ER blockade produced the most evident elevation and attenuated ethanol-evoked elevation in myocardial ROS. In conclusion, the findings support a greater role for ER signaling in the E2 dependent molecular events that culminate in myocardial oxidative stress and dysfunction caused by ethanol in proestrous rats.

PP2

Glucose Metabolism is Impaired in Cultured Myotubes from Severely Obese Humans, Kai Zou^{1,2}, J. Matthew Hinkley^{1,2}, Sarah C. Billings³, Sanghee Park^{1,2}, Donghai Zheng^{1,2}, Terry E. Jones³, Pamela J. Hornsby⁵, James Lenhard⁵, Walter J Porities⁴, G. Lynis Dohm¹ and Joseph A. Houmard^{1,2}

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In vivo, severe obesity is associated with marked defects in skeletal muscle glucose metabolism, including impaired insulin-stimulated glycogen synthesis and glucose oxidation. However, it is not evident if these

metabolic defects are retained in human primary skeletal muscle cells (HSkMCs) raised in culture, which indicates a genetic and/or epigenetic influence. The purpose of this study was to determine whether impaired glucose metabolism is retained in differentiated myotubes established from severely obese subjects. HSkMCs obtained from lean (n=9, BMI = 23.0 ± 0.1 kg/m²) and severely obese (n=7, BMI = 50.0 ± 0.6 kg/m²) muscle biopsies were differentiated to myotubes. Radiolabeled I-14C glucose was used to measure glycogen synthesis, glucose oxidation and non-oxidized glycolysis rates in the presence or absence of insulin. While no differences were observed at basal state, insulin-stimulated glycogen synthesis and glucose oxidation rates were significantly elevated to greater extents in myotubes from lean subjects (35% and 14%, respectively) in comparison to the severely obese (20% and 7%, respectively). In contrast, non-oxidized glycolysis rate did not change in myotubes from lean donors in response to insulin, but largely increased (26%) in severely obese, resulting in a decreased (16%) ratio of oxidized to non-oxidized glucose in comparison to lean controls. Taken together, these data suggest that myotubes established from severely obese humans have impaired glucose metabolism.

PP3

Characterize genetic interaction between fuzzy tassel (fzt) and knottedI (knI) in maize, Queying Ding, Beth Thompson, Department of Biology, East Carolina University, Greenville, NC

The maize fuzzy tassel (fzt) mutant contains a mutation in a dicer-like I homolog and displays severe defects in both vegetative and reproductive development. dicer-likeI encodes a critical enzyme for microRNA (miRNA) biogenesis. miRNAs are small non-coding RNAs that play important roles in plant meristem maintenance-homeostasis, determinacy and function. Among other defects, fzt mutant inflorescences are fasciated and multiple meristems are indeterminate. knotted I (knI) encodes a homeobox transcription factor that is a master regulator of meristem maintenance. In restrictive genetic backgrounds, loss-of-function knI mutants have a limited shoot phenotype in which the shoot apical meristem is not maintained. In permissive genetic backgrounds however, knI mutant defects are limited to the inflorescence, which have increased meristem determinacy. To investigate the genetic relationship between fzt and knI in the inflorescence, we generated a knI; fzt double mutant in a permissive genetic background that does not normally affect vegetative growth of knI single mutants. Surprisingly, the double mutant rarely geminates or arrests soon after germination, suggesting the genetic interaction between knI and fzt causes early lethality. We are currently characterizing the cause of this lethality and focusing on the search for possible embryonic and early shoot defects in the double mutant. We are also examining common target genes of miRNAs and KNI to investigate the molecular underpinnings of the early lethality in the double mutant.

Sphingolipid Metabolism — Exploitation and Integration of Novel Targets for Melanoma Therapy, Samy A.F. Morad¹, Lance C. Bridges¹, Terence E Ryan², and Myles C. Cabot¹

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²Departments of Physiology, East Carolina University, Brody School of Medicine

Melanoma is a highly aggressive, rapidly metastatic and difficult to treat cancer. The incidence of melanoma has increased worldwide and to date has not benefited by significant therapeutic breakthroughs despite the introduction of biochemotherapies. The Dartmouth regimen, of which the breast cancer drug, tamoxifen is a standard component, has also had little impact on outcome. Sphingolipid (SL) metabolism is an area of cancer science that has recently risen to prominence. This is because ceramide, the aliphatic backbone of SL's, can act as a powerful tumor suppressor. However, cancer cells rapidly inactivate ceramide via two major metabolic routes: glycosylation to form glucosylceramide, and hydrolysis, which generates sphingosine I-phosphate, a mitogenic SL. These actions severely blunt ceramide's anticancer properties, thwarting potential utility in treatment. This study explores a novel combination therapy for melanoma comprised of cell-permeable ceramide (C6-ceramide) and tamoxifen and demonstrates that this novel regimen is highly effective in inhibiting melanoma cell proliferation, inducing caspase-dependent apoptosis, promoting cell cycle arrest, increasing mitochondrial depolarization, and decreasing mitochondrial complex I supported state 3 respiration and maximal uncoupled respiration. Moreover, the drug regimen diminished melanoma tumorigenicity as evidenced by reduced cellular adhesion and migration and abatement of cell surface integrin expression. Additionally, the drug duo downregulated expression of the main player of drug resistance in melanoma, survivin. Our drugs exploit the essential elements of a drug regimen useful for limiting melanoma growth. Because integrin expression often correlates with conversion of melanoma growth from radial to vertical, and we are able to target mitochondria, which contribute to chemotherapy resistance, we propose that the ceramide-tamoxifen combination can serve as a lead regimen for targeting metastatic, chemotherapy- resistant disease.

cyclooxygenase-2 (COX-2). COX-2 is an enzyme that metabolizes arachidonic acid (AA) to prostaglandins (PGs) of the E-, F-, and D- series. D-series PGs (PGD2) are then converted to J-series PGs (PGJ2) and these lipids induce apoptosis by different mechanisms. Anandamide (AEA) is a cannabinoid that causes apoptotic cell death in diverse tumor types. The cytotoxicity of AEA is mediated by endocannabinoid receptors, CB1 and CB2. However, recent studies have reported that receptor-independent effects may also account for its activity. Several studies have attributed the receptor-independent cytotoxicity of AEA to COX-2. COX-2 metabolizes AEA to E-, F-, and D-series prostamides (PG-EAs). Our previous data showed that AEA is also converted to a novel metabolite, prostamide J2 (PGJ2-EA). AA-derived PGJ2 induces ER stress-mediated apoptosis. Therefore, the current study examines the role of PGJ2-EA in the activation of the apoptotic ER stress pathway.

JWF2 cells are tumorigenic keratinocytes which overexpress COX-2 while HaCaT cells are non-tumorigenic keratinocytes that contain low endogenous COX-2 levels. To determine if AEA is selectively toxic to NMSC cells, JWF2 and HaCaT keratinocytes were used. A significant reduction in cell viability was observed in JWF2 but not in HaCaT cells treated with AEA. In JWF2 keratinocytes, AEA induced apoptosis and increased the expression of apoptotic ER stress proteins, C/EBP homologous protein-I0 (CHOP10) and caspase-12. In addition, the ER stress inhibitors, salubrinal and 4-phenylbutyric acid, blocked the cytotoxic effect of AEA. To evaluate the role of PGJ2-EA in AEA-induced ER stress-apoptosis, the selective PGD synthase inhibitor, selenium tetrachloride (SeCl4), was used. SeCl4 reduced AEA-mediated synthesis of PGD2 and PGJ2, CHOP10 expression, and the initiation of apoptosis. Furthermore, we verified that the effect of AEA on ER stress-apoptosis was cannabinoid receptor-independent.

These findings implicate PGJ2-EA as the initiator of AEA-induced ER stress-apoptosis. Since this metabolite is formed in presence of COX-2, AEA may be an ideal topical treatment for NMSCs.

Anandamide induces endoplasmic reticulum stress-apoptosis in tumorigenic keratinocytes: Role of cyclooxygenase-2 and novel cytotoxic metabolite, prostamide J2, Eman Soliman, Allison Danell and Rukiyah Van Dross, East Carolina University, Greenville, NC

Non-melanoma skin cancer (NMSC) is the most common cancer in the United States. The major problem associated with chemotherapeutic and radiation therapy for NMSCs is the absence of selective toxicity. The goal of the present study was to determine the molecular mechanism of action of a potential selective treatment for NMSC. NMSCs overexpress

PP6

The Mitochondrial Targeted Peptide MTP-I3I Restores Limb Perfusion and Reduces Pathology in Ischemic Limb Muscle of Genetically Susceptible Mice, *Terence E. Ryan, Cameron A. Schmidt, Rick J. Alleman, Alvin M. Tsang, Tom D. Green, P. Darrell Neufer, David A. Brown, & Joseph M. McClung, East Carolina Diabetes and Obesity Institute, Departments of Physiology and Kinesiology, East Carolina University, Greenville, NC.*

Critical limb ischemia (CLI) is a common manifestation of diabetic peripheral arterial disease, but very little is known regarding the cellular mechanism(s) responsible for the exacerbated necrotic pathology and vascular regression that accompany this clinical presentation. We tested the hypothesis that mitochondrial dysfunction contributes to the vascular pathology after limb ischemia (HLI) in genetically susceptible (BALB/c) mice. Furthermore, we hypothesized that MTP-I3I (Bendavia), a mitochondria-targeting peptide currently in clinical trials for metabolic diseases, would alleviate ischemic pathology and improve both electron transport system (ETS) flux and tissue perfusion. Daily MTP-I3I attenuated the severity of BALB/c limb tissue necrosis, and improved ischemic muscle regeneration (210%) at HLI day-7. LDPI assessment of limb perfusion (expressed as % of contralateral limb) was improved by daily MTP-I3I (64.7±11%) versus BALB/c vehicle control (39.9±4%), restoring values to those observed in the ischemic limb of genetically protected BL6 mice (59.7±7%) at HLI day-7. MTP-I3I increased basal BALB/c limb muscle mitochondria ETS flux (540%), as well as ETS flux through Complex I State 3 (1000%), Complex I+II State 3 (540%), Complex II State 3 (420%), and FCCP (250%) from vehicle control values after HLI day-7. These findings demonstrate an important link between ischemic tissue bioenergetics and neovascularization and indicate that the ischemic limb mitochondria may be a pharmaceutical target for therapeutic intervention during critical limb ischemia.

PP7

A comprehensive toolkit for multiplex CRISPR-Cas9 genome editing in plants, *Levi G. Lowder, Nicholas J. Baltes, Joseph W. Paul, III, Daniel F. Voytas, Tzung-Fu Hsieh, Yong Zhang, Yiping Qi, East Carolina University, Greenville, NC*

Efficient genome editing and engineering strategies, such as those offered by CRISPR/Cas9 nuclease based systems, are emerging as some of the most powerful and important molecular tools available. The relative ease, speed and biological scope of targeted genome editing using CRISPR/Cas9 based systems is revolutionizing virtually all areas of molecular biosciences including functional genomics, genetics, applied biomedical research and agricultural biotechnologies. In plant systems, however, a number of hurdles currently exist that limit this technology from reaching its full potential. Plant based CRISPR/Cas9 genome editing and engineering is relatively easy, cheap and fast but it requires significant plant molecular biology

expertise and effort to generate functional expression constructs that meet current standards for complexity, utility and flexibility; such as targeting or engineering multiple different genomic alleles simultaneously or “multiplexing”. In order to streamline and facilitate rapid and wide scale use of CRISPR/Cas9 based technologies in plants we have developed and demonstrated a comprehensive molecular toolkit for CRISPR/Cas9 use in plants. This toolkit provides researchers with a protocol and reagents to quickly and efficiently assemble functional CRISPR/Cas9 genome editing constructs in monocots and dicots using Golden Gate and Gateway cloning methods. The kit comes with a full suite of capabilities that include single and multiplex targeted editing, paired nicking, large chromosomal deletion as well as multiplexed transcriptional activation and repression. We demonstrate our reagents are functional and effective and will make the toolkit available to the research community via addgene.

PP8

Technology Decision Assessment Companion (TDAC): Bridging the Gap between Researcher and Inventor, *A. Carlyle Rogers and Marti Van Scott, Office of Technology Transfer, East Carolina University, Greenville, NC*

The mission of East Carolina University's Office of Technology Transfer is to promote innovation, enhance research and facilitate economic development through protecting and commercializing intellectual property. It is through the successful commercialization of the University's intellectual property that a significant benefit can be gained by the inventor, department, college, university and region. Despite the benefit of commercializing intellectual property, not every idea is well suited for investment by the University. Furthermore, factors not considered during the pursuit of research can often hinder the commercialization process. To bridge the gap of knowledge between research investigators and commercialization we have created the Technology Decision Assessment Companion (TDAC). TDAC is a series of electronic check-lists designed to assist ECU inventors, patent committee members and technology transfer staff in assessing inventions. TDAC is meant to serve as a guide to facilitate the evaluation of prior art, market, team members, research and development, funding and data collection. We propose that the use of TDAC will help to identify different risks associated with a particular invention and if properly managed can lead to a higher probability of commercialization success. Pilot testing examining previous invention disclosures will be used to demonstrate TDAC's predictive capability. In addition to managing risk, TDAC is also proposed to be used as an educational tool that will help to inform the research community at ECU about different aspects of the commercialization process. Pilot testing of TDAC with ECU researchers with no previous commercialization experience will be used to establish that TDAC can aid researchers in understanding important commercialization concepts.

Responses of Lipolysis to a Meal after Physical Activity in Lean and Obese Children, *Huimin Yan^{1,2}, Kimberly B Myers³, Gabriel S. Dubis S Dubis¹, Joseph R Pierce¹, Chuck J Tanner¹ and Robert C Hickner^{1,2}*

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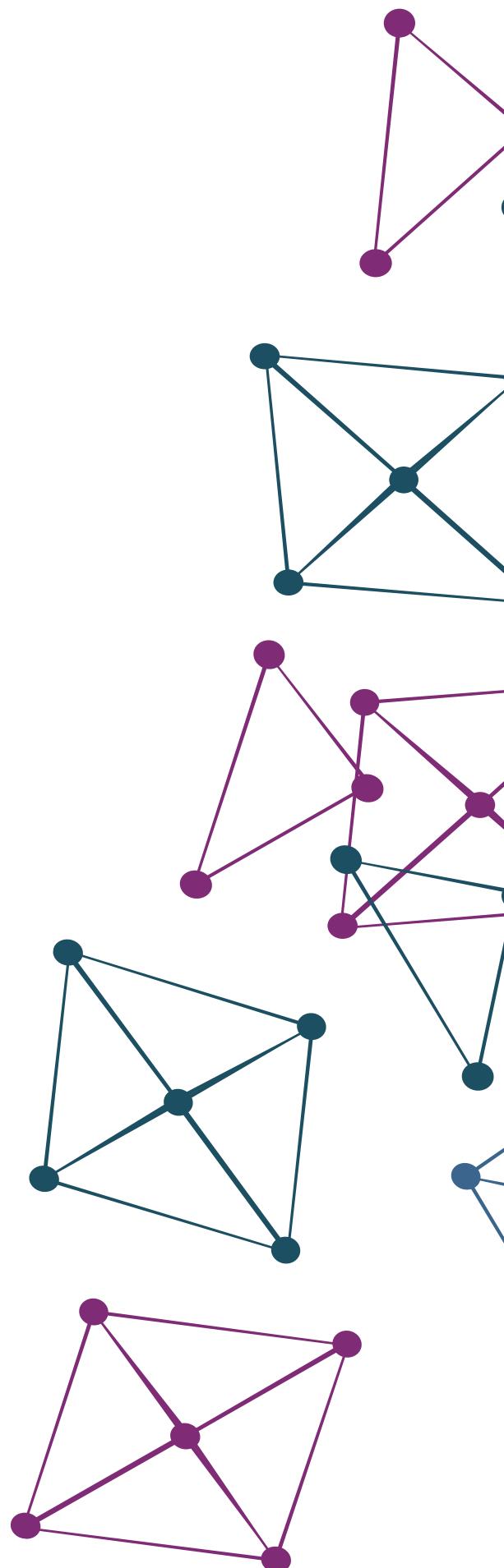
Purpose: This investigation was conducted to determine whether an acute bout of aerobic exercise would affect lipolytic response to food intake in lean (LN) and obese (OB) children.

Methods: 44 children (EX: 16 LN and 28 OB, age 8-11yr) performed 20 min of aerobic exercise eliciting an average heart rate of 140 beats/min (plus 6 min of warm-up and cool-down) between standardized breakfast (~300 kcal) and lunch (~500 kcal) meals, while 21 children (CON: 9 LN and 12 OB, age 8-11 yr) remained rested between meals. Microdialysis probes were inserted into the subcutaneous abdominal adipose tissue to monitor interstitial glycerol (lipolysis). Changes in interstitial glycerol concentrations were calculated from one-hour dialysate samples collected before and after ingestion of each meal. Two-way (meal by adiposity group) ANOVAs were separately performed in EX and CON.

Results: In CON, the lipolytic response to the meal was attenuated after lunch compared to after breakfast regardless of obesity status (main effect of meal, $p < 0.05$; $-141 \pm 44 \mu\text{M}$ vs. $-4 \pm 24 \mu\text{M}$ for changes in interstitial glycerol after breakfast and lunch, respectively). In EX, a meal by group interaction was found for changes in interstitial glycerol ($p < 0.05$; LN: $-416 \pm 15 \mu\text{M}$ vs. $-66 \pm 58 \mu\text{M}$; OB: $-60 \pm 117 \mu\text{M}$ vs. $-152 \pm 44 \mu\text{M}$ for breakfast and lunch, respectively).

Conclusion: The suppressive effect of food intake on lipolysis in subcutaneous abdominal adipose tissue in children may be attenuated after lunch compared to breakfast. The anti-lipolytic response to food intake can be enhanced with acute exercise in obese children.

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UO1

Social status dependent adaptation of the Mauthner mediated C-start escape response in zebrafish (*Danio Rerio*), Katie Clements¹, Eeon Hye Ji², Fadi Issa

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Zebrafish form social hierarchies that consist of either socially dominant or submissive fish. Once social status is established, the behavior patterns and social displays between competing males reflect their social standing. The objective of this project was to determine the neural bases of social behavior by identifying brain circuits that are influenced differently in animals of established social status. When zebrafish are startled, they produce a stereotypical escape response called the C-start escape behavior. The underlying neural circuit that mediates C-start escape is well characterized and is centered on the Mauthner command neuron that is activated via auditory input. We hypothesized that social experience will affect the sensitivity of zebrafish escape behavior and the activation threshold of the underlying Mauthner neural circuit. To test our hypothesis, two male zebrafish of similar age and size were paired for one week during which their social interactions were observed daily to monitor their social relationships. We then tested the zebrafish C-start escape response by delivering a brief auditory pulse at increasing decibels (70-105dB). Escape behavior produced in response to the auditory pulses was recorded via bath electrodes placed in the testing chamber, which measured the field potentials generated during escape behavior. Response sensitivity and habituation to auditory pulses of dominant and submissive animals were compared to control communal fish. Initial results show that dominants are less sensitive compared to submissive zebrafish. In conjunction, communal zebrafish, when chosen at random, are more likely to behave like dominant zebrafish. This suggests the neural change that occurs in the zebrafish is that of the subordinates. Furthermore, submissive fish are less likely to habituate to repeated stimulation compared to their dominant counterparts. We plan to probe brain nuclei that integrate social cues and differentially influence the Mauthner neural circuit in socially dominant and submissive zebrafish. These experiments will lead to a better understanding of the reconfigurations in the vertebrate central nervous system based on social status.

UO2

Conspecific pollen precedence and its contribution to speciation in *Triodanis perfoliata*, Adrian D. Modzik, Carol Goodwillie, East Carolina University, Greenville, NC

Speciation is the process by which one species diverges into two distinct species. To fully understand speciation, it is important to understand reproductive isolation. Reproductive isolation, the inability of two individuals to mate and produce viable offspring, restricts gene flow between populations allowing them to diverge as distinct

species. Reproductive isolation can be caused by several factors or mechanisms. Some of these factors that are unique to plants include different temporal flowering patterns, different pollinators, and conspecific pollen precedence, or the preference for conspecific pollen for fertilization in the presence of both conspecific and heterospecific pollen. This study asks whether conspecific pollen precedence contributes to reproductive isolation between subspecies of *Triodanis perfoliata*. *Triodanis perfoliata* is a weedy species of plant that has two subspecies, *Triodanis perfoliata* subsp. *perfoliata* and *Triodanis perfoliata* subsp. *biflora* that grow sympatrically in eastern North Carolina. Based on experimentation, it has been shown that these subspecies can breed and produce viable hybrid offspring; however, the two subspecies have distinct sets of traits. The question remains as to what factors contribute to isolation of the two subspecies. In this experiment, plants were raised that were produced by mixed pollinations. Using morphological traits, hybrid and pure offspring were identified in the offspring generation, and these identities were verified by AFLP (Amplified Fragment Length Polymorphism) genetic markers. If the frequency of the hybrid and pure individuals in the offspring of mixed pollination deviates from the null expectation of a 1:1 ratio, we will conclude that conspecific pollen precedence contributes to reproductive isolation, providing insight into speciation mechanisms in the study species.

UO3

Effects of Carbon Based Media in BioSand Filters on Drinking Water Quality, Melissa Jean Wilson

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Today, one in nine people worldwide lack access to clean water. One way this problem is addressed in developing countries is with the instillation of BioSand filters (BSF). It is estimated that worldwide there are over 300,000 BSFs in use, which remove pathogens, particulate material, and metals. A BSF cleans water via mechanical trapping and biological filtration. After about 30 days, a biolayer of microbes forms in the top of the sand layer which uses trapped pathogens as a food source, thus removing pathogens from the water. Although the BSF greatly decreases the amount of harmful material found in water, the E. Coli levels in the treated water is often at a level that the WHO classifies as a low (1-10 coliforms per 100 ml) or even intermediate risk (10-100 coliforms per 100 ml).

This study seeks to evaluate E. Coli removal via a modified BSF. It is hypothesized that with the addition of a carbon-based media (wood chips), the filter will have increased removal of bacterial contaminants. To test the efficacy of a BSF with additional wood chip media, three control and three experimental BSF were constructed. The control filters were constructed as described by the Centre for Affordable Water and Sanitation Technology guidelines which specify a range of acceptable container sizes, acceptable filter materials, and construction methods.

In the experimental filters, a portion of the sand media was replaced with wood chips. Each filter has two taps, one directly below the wood chip layer and one at the bottom of the filter. Taking measurements at two depths will indicate the advantage, if any, of additional sand media. Influent and effluent water will be measured for E. Coli, pH, and turbidity. E. coli will be measured using IDEXX most probable number method.

UO4

Generating and characterizing androgen receptor knockouts in zebrafish, Zayer Thet, Yong Lengxob, Yong Zhu; Department of Biology, East Carolina University, Greenville, NC

Androgen receptor (Ar), a member of nuclear steroid receptor family, plays important roles in the development of gonad and brain, and display of reproductive and aggressive behaviors. Ar mediates androgen signaling typically through a genomic signaling pathway, in which an androgen and Ar complex acts as a transcriptional factor directly or indirectly regulating gene expressions and physiological processes. Various physiological processes or disorders such as fertility, secondary sexual characteristics, sexual drive and aggressive behaviors have been associated with Ar signaling. However, the roles of Ar and molecular mechanisms that regulate these physiological processes and behaviors are still not well defined, particularly in non-mammalian models. To better understand the roles of Ar and its signaling mechanisms in the development of germ cell and behaviors, we have generated the first non-mammalian Ar-knockout model in zebrafish using genetic editing technology—transcription activator-like effector nuclease (TALENs). Our preliminary observations revealed that male fish are infertile, which is consistent with the phenotype reported in Ar-KO mice. We plan on examining the broad effects of AR-KO on male reproductive components, including behavior, morphological, and tissue specific changes as to ultimately investigate potential proxies of male infertility. Our Ar knockout models and proposed study will likely advance our understanding on the roles of Ar and its signaling on the development of germ cell, gonads, masculinization processes, and behaviors in vertebrates.

UO5

Optically Stimulated Luminescence From Human Tooth Enamel, Isaac Joseph Boota, East Carolina University, Greenville, NC

With the increasing advances in the utilization of nuclear energy in the 20th Century, there is a need for monitoring such radioactivity to ensure public safety. It is desirable to measure the radiation absorbed quickly and efficiently in order to perform treatment on persons that will best benefit from medical care. In efforts to build an instrument to perform *in vivo* measurements on individuals exposed to radiation, optically stimulated

luminescence on human teeth is investigated.

Optically stimulated luminescence is the process by which an irradiated sample gives off luminescence at the exposure of light. The defects within a crystalline structure act as traps, allowing the deposition of high-energy electrons. As the sample is stimulated with light, the electrons gain energy and get un-trapped, and return to the ground state while emitting light. Furthermore, the intensity of light emitted by the sample correlates to the dose of radiation absorbed.

The particular kind of material under focus in this research project is the human tooth. The hydroxyapatite in teeth allows the OSL technique to be performed on human tooth enamel. Different kinds of teeth were used to prepare individual samples of tooth enamel. These samples were used to investigate a minimum measurable dose, the signal lost with lapse of time, and how different teeth properties effect OSL. Finally, the correlation between light intensity to concentration of radiation absorbed is investigated per tooth in efforts to develop a general equation that would yield a good approximation of dose absorbed by any sample of tooth enamel.

UO6

Dopamine (DA) receptors D1 and D3 in the spinal cord and their effect on morphine responsiveness with age., Sophia Samir¹, Alexander P. Yllanes¹, Kori Brewer², and Stefan Clemens¹

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Pain signaling is mediated via nociceptive pathways in the spinal cord. Commonly, opioids such as morphine are used to treat chronic pain, but their efficiency is greatly reduced with age. Neural networks in the spinal cord are modulated by monoaminergic pathways descending from the brain, including dopamine (DA), and we have previously shown that young dopamine D3 receptor knockout mice (D3KO) had lower pain thresholds than their age-matched wild type (WT) controls and that they were unresponsive to morphine, but expressed higher levels of the excitatory D1 receptor (DIR). Here, we wanted to test if the pain behavior (I) was modulated by DA receptor compounds, (2), changed its responsiveness to opioids with age, and (3) whether these changes were mimicked or could be induced in the D3KO animal.

We tested withdrawal latencies (Hargreaves' apparatus) for two different age groups of WT and D3KO (2 month and 1 year) with varying dosages and/or combinations of morphine and a DIR antagonist (. After establishing baseline withdrawal latencies we treated the animals with intraperitoneal (i.p.) injections of saline (control), morphine (2 mg/kg and 5 mg/kg respectively), D1 antagonist (0.1 mg/kg), and morphine-D1 antagonist combinations (2 mg/kg + 0.1 mg/kg; 5 mg/kg + 0.1 mg/kg).

For the WT mice, we found that there was no significant change between the varying doses of morphine with age, but that 1 year-old WT had a slightly lower withdrawal latency than 2 month-old WT for 5mg/kg morphine ($P=$). The DIR antagonist did not significantly improve latencies in 1 year WT nor the 2 mo. WT.

For D3KO, we found that low-dose application of morphine had no significant effect in young or old D3KO, but that withdrawal latencies under high morphine increased significantly in 2 month D3KO. However, even high morphine was insufficient to significantly alter withdrawal latencies in the 1 year D3KO cohort. Further, co-administration of the DIR-antagonist and low or high levels of morphine increased withdrawal latencies in young D3KO, but D1-antagonist co-administration was only effective in the old animals with the higher dose of morphine.

Taken together, these data suggest that the D3KO animal may be model to study morphine tolerance in the spinal cord, and that the interaction between morphine and D3Rs might be mediated via the DIR system.

UO7

Epigenetic Effect of Modified Diet and Exercise on Drosophila Melanogaster Metabolic Phenotype and Cardiovascular Health, A. Ajmera¹, A.K. Murashov, ¹Department of Physiology, Brody School of Medicine, Greenville, NC

Obesity is a growing world-wide epidemic. Overweight populations are prone to a variety of morbid conditions including diabetes type 2, cardiovascular diseases, and cancers. The catastrophic increase in obesity rates is largely attributed to sedentary life style and a poor diet. Epigenetic studies show maternal obesity as a risk factor for metabolic syndromes in offspring. Furthermore, evidence suggests obese and diabetic fathers may also contribute to offspring metabolic phenotype, so we questioned whether a modified paternal diet and exercise may produce transgenerational effects on offspring metabolic phenotype using Drosophila Melanogaster as a model because of its powerful genetics and short life cycle, making it ideal for transgenerational studies. Specifically, this research sought to look at the effects of high-fat and high sucrose diets and exercise on whole body composition, the change in expression of various metabolic genes, microRNAs, and specifically effects on cardiovascular health in Drosophila F0, and F1 generations. To test the effects of diet and exercise, male flies were exposed to either 14 days of a high-fat, a high-sucrose, a high- fat/high-sucrose, or control diet and then mated with control virgin females. Offspring were collected after hatching and subjected to a normal or modified diet for 14 days. After 14 days, animals were analyzed for triglyceride and trehalose/glucose levels in F0 and F1 generations. Fruit flies were also subjected to exercise for 14 days to measure the effects on phenotype. A vertical test was done before and after exercise to measure the effect of exercise on motor activity. Height climbed was measured in centimeters after vials were tapped down and flies were allowed to climb up for 5 seconds. Cardiovascular health was measured by beats per minute and was recorded at various time points throughout the 14 day diet. Preliminary results indicate a significant increase in amount of triglycerides and trehalose in exercise father offspring flies on a high-fat diet challenge than control flies. There was also a significantly increased heart rate for F0 flies on a high-fat diet in comparison to F0 flies on a control diet and vertical test data showed a significantly higher level of motor activity from the exercise group than the control group through day 7. The combined data suggest paternal experience due to diet and exercise induces transgenerational effects in F1 male flies.

UO8

The Association Between Metabolism and the Expression of Circadian Regulatory Genes, Aenia Amin, Kendal Carter, Victoria Chapman, Zoe Hinton, Savannah Powers, The Honors College, East Carolina University, Greenville, NC

According to NHANES III, 23.7% of all U.S. adults had metabolic syndrome, a disorder characterized by obesity, type 2 diabetes mellitus,

hypertension, and increased mortality from cardiovascular disease. A potential cause may be related to the impairment of the functions of the circadian regulatory genes. Preliminary data suggests that disruptions in biological rhythms may lead to attenuated circadian feeding rhythms and disrupted metabolism. The transcription regulators *bmal*/*clock* and *per2* interact through an oscillatory feedback mechanism to control expression of circadian-controlled output genes. Based on previous studies, deletion of *per2* results in a 40% decrease in fat/lean ratio in mice. The expression of key circadian regulatory genes (*bmal*, *clock*, and *per2*) in liver was explored in a F2 population of mice derived from BALB/c and C57/bl/6 mouse strains. All mice were exposed to carbon tetrachloride (CCl₄), a standard model of fatty liver disease (i.e., steatohepatitis); two cohorts of 10 mice were sorted based on the extremes of liver weight: body weight ratio phenotype. The hypothesis is that there is a difference in the expression of circadian genes between the phenotypes. A significant difference was found between the expression of *per2*, *bmal*, and *clock* in the low LW:BW group and the high LW:BW group. Moreover, the ratio of *bmal*:*per2* and *clock*:*per2* were depressed in the high LW:BW group compared to the low LW:BW group. These data suggest that higher liver weight:body weight promotes dysregulation of circadian genes, disrupting metabolism and potentially contributing to metabolic syndrome.

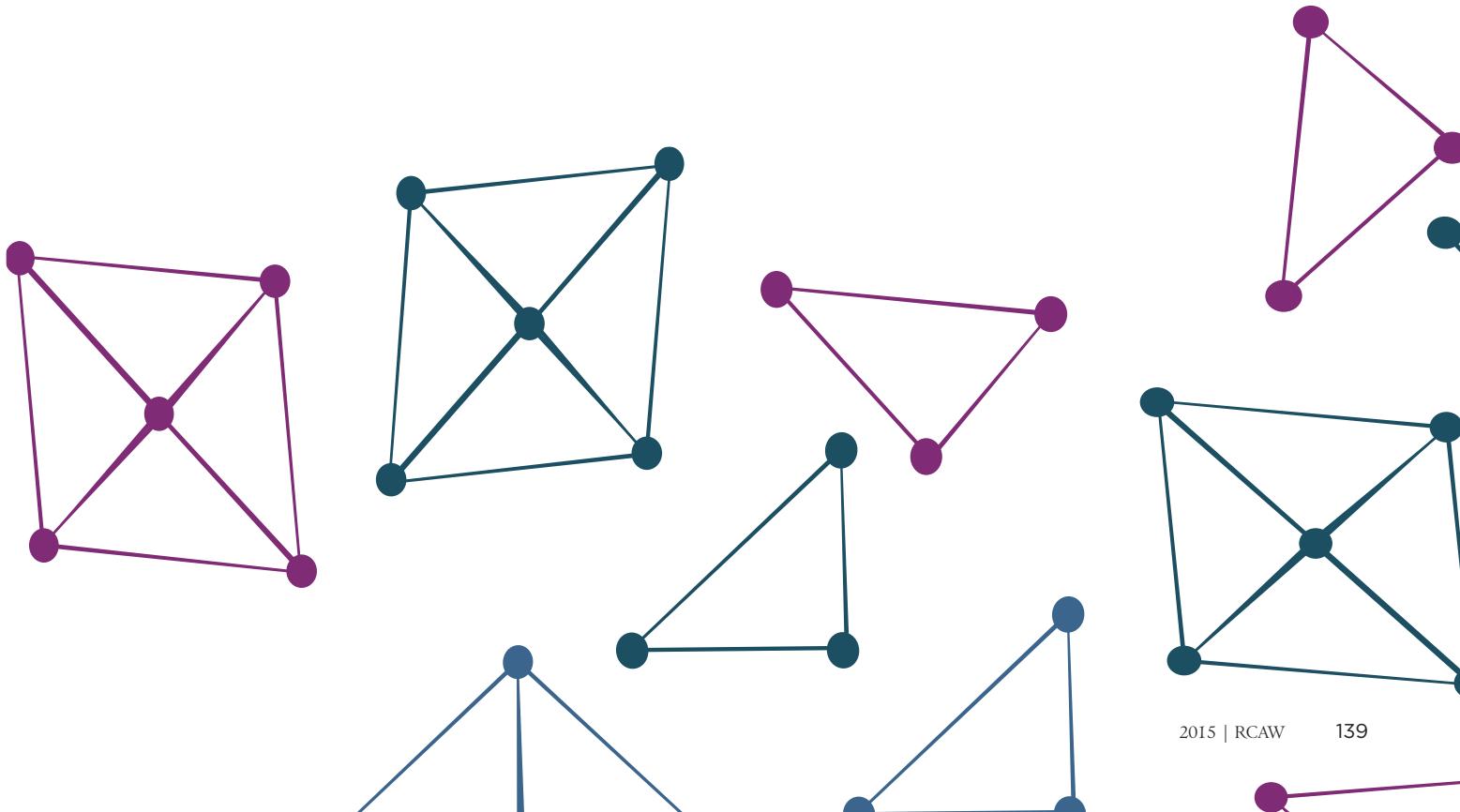
UO9

PRESENTATION WITHDRAWN

UO10

Vaccinia Virus OIL Virulence Gene and Protein Localization,
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East Carolina University, Greenville, NC

Smallpox killed an estimated 500 million people in the twentieth century alone. Although this fatal disease was eradicated from the world over thirty years ago, its potential use as a bioterrorism agent remains a concern. In addition, monkeypox continues to cause human outbreaks in Africa, and in the US in 2003. Vaccinia virus, the live virus vaccine for smallpox and monkeypox, is dangerous for immunocompromised individuals, and a safer vaccine is needed. Our lab studies how poxviruses cause disease in mammals and which genes contribute to virulence. The vaccinia virus OIL gene is highly conserved in poxviruses, and we have shown that it is required for full virulence in mice. When the OIL gene is removed from the wild type virus, the virus becomes attenuated, and immune responses are improved. Very little is known about this protein including its molecular weight, location within the cell and its function. We raised anti OIL peptide antibodies in rabbits and are using these to investigate the localization of the OIL protein using immunofluorescence techniques. According to preliminary data from Western Blot analysis, we hypothesize the OIL protein is localized in the nucleus of the cell. Identifying where the protein localizes will help us to form further hypotheses as to the mechanism of OIL immunosuppression and understand how poxviruses control the immune system. For example, if OIL is in the nucleus, it might affect gene expression, and if it is in the endosomes, it might affect protein trafficking. This research will increase our understanding of poxvirus pathogenesis and aid in the creation of new and safer vaccines.



UO11

Respiratory Measures of Musical Theater Singers, Classical Singers, and Non-singers., Ms. Payton Burnette, Dr. Kathleen Cox CCC-SLP, Dr. Balaji Rangarathnam CCC-SLP, Department of Communication Sciences and Disorders, East Carolina University, Greenville, NC

Background

The purpose of this project is to determine whether respiratory patterns differ significantly between musical theater singers, classical singers, and non-singers. As preliminary data, we are reporting aerodynamic measures in musical theater students and non-singers. The research has been approved by the IRB at East Carolina University. Data from eight female subjects, four in each group, are reported.

Subjects

Subjects in the non-singer group never received formal private voice lessons while the musical theater subjects were currently enrolled in the musical theater program at East Carolina University and had received at least one semester of voice lessons in that program. Subjects were within the age range 18-39, not pregnant, non-smokers, with no history of vocal or respiratory pathology.

Methods

The subjects were assessed for their aerodynamic capacities using the KayPENTAX Phonatory Aerodynamic System (PAS). The protocols of vital capacity, maximum sustained phonation, comfortable sustained phonation, variation in sound pressure level and voicing efficiency were administered. The subjects completed three trials of each protocol and an average of the three trials was computed. Mann-Whitney U tests were carried out as part of statistical treatment of the non-parametric data.

Results

Results of this preliminary data showed significant differences only in measures of maximum phonation time (p -value: 0.029) and peak expiratory airflow (p -value: 0.029). Interestingly, we did not find significant differences in laryngeal resistance and aerodynamic power in the voicing efficiency protocol. As we continue our research including more subjects and a third group of classical singers, we expect to identify more differences between the groups and solidify the patterns revealed in the preliminary data.

UO12

The framing and agenda-setting functions of mass shooting reports in print media, Grace Delphine Haskin and Aysel Morin, East Carolina University, Greenville, NC

The agenda setting and the framing functions of the media have been two important issues that have concerned the scholars of communication, media, and politics since 1960s. The present study has been conceived as a contribution to this ongoing discussion. Within the confines of an independent study class I am taking from Dr. Aysel Morin this semester, I have been involved in an on-going research project that examines the

framing of the recent violent attacks and shootings at schools, public places, and official sites in the United States. Our goal is to examine the newspapers' framing of these attacks, and to identify the main concepts used in the framing of the stories.

Our study focuses on the eight recent cases ranging from the Virginia Tech (2007) and the Sandy Hook Elementary School (2012) shootings to the Colorado movie theater (2012) shooting and Boston Marathon bombing (2013). We have chosen to study the first 30 day of news coverage of these events in three national newspapers: The New York Times, the Wall Street Journal, and USA Today. We currently are in the process of coding and analyzing data. I would like to present our preliminary findings during the Research and Creative Activity week and share them with the ECU community. Should you need more information you may contact me or Dr. Morin at morina@ecu.edu. Thank you for your consideration.

UO13

I Lie Awake - A Dance Performance Piece, Kristalyn Gill, East Carolina University, Greenville, NC

As a dance performance and public relations double major, I am fascinated with self-disclosure through verbal and nonverbal communication. Our society relies on words and gestures to describe personal experiences and emotions. People disclose what they see as reality through verbal and nonverbal communication.

In this project, I explore the interaction between verbal and nonverbal communication regarding pain. This piece can be performed on a stage or in a nontraditional setting - an 8 x 10 foot space. The dance is inspired by the phases of the moon and how this cyclic process can symbolize the emotional phases one passes through when dealing with pain. These emotions are sadness, anger, confusion, desperation, and acceptance. Specifically, I reflect on how these emotions are portrayed through various encounters with pain caused by different situational catalysts. Circumstances include a teenager born with a hearing disability, a military officer with phantom limb pain, a mother with depression, and an abused child.

In the piece, there are four dancers moving to six spoken word poems that I have written. The female cast performs the majority of the work sitting on chairs while wearing loose, gray clothing. Dancers will change facings to reflect the shifting patterns of the moon's appearance. The speaker faces the audience during the entire work. The music will be instrumental and is roughly seven minutes long. As the dancers' movement and the speakers' words change alongside shifts within the music score, the stage lighting passes through various phases of brightness. The mood is restless, indifferent, and tired. The dancers and the speaker take on characters that have had multiple distressing interactions with pain and consider it to be affecting their lifestyles.

I desire for this work to be shown so that audience members may increase in awareness about the emotional cycle pain often initiates, which impacts individuals in a way that is not commonly reflected upon. I aspire for

people to see pain from a spectator's position so they are able to witness how pain controls the thoughts of the mind and alters the functions of the body. Pain has the unsettling ability to consume and alter individuals over time in a variety of ways due to different circumstances. It is through this work that I hope to stimulate audience members to begin thinking about the effects of pain and consider ways to prevent this vicious cycle, both physically and mentally.

UO14

2014 Apple iHack, *Summer Marie Falgiano, Kristopher H Walter, Nichole Ann Edwards, Shannon Joan Keegan, East Carolina University, Greenville, NC*

The iCloud is a cloud storage and computing service operated by Apple Inc. since 2011. In late August 2014, a collection of almost five hundred private photos of various celebrities on iCloud were posted to an online image board, 4Chan, and later circulated by other users on websites and social networks such as Reddit and Tumblr. The photo release seemed to be the result of the iCloud security breach, but was later confirmed to be a targeted attack by a group of hackers in an attempt to earn bitcoins. This case addresses the communication efforts Apple Company undertook with its customers to assure them of the iCloud security.

Apple stated that user data is stored and shared by encrypting data when it is sent over the Internet, storing it in an encrypted format on a server, and using secure tokens or passwords for authentication. This allows the data to be protected from unauthorized access. However, iCloud turns out to be vulnerable to "brute force" attack, which has a computer program generate and test unlimited number of potential passwords until an account is entered.

The iHack was a media outbreak. All over the different media platforms broadcasted the issue at all angles, including responses of celebrities and publics to the situation, what Apple plans to do in the future, and how users to keep their photos private.

This case demonstrates the importance of planning communication efforts for a crisis caused by security breach of data, because the gravity of the cloud storage security hack is very detrimental to the reputation of companies that hold data centers. The case also suggests several public relations strategies for Apple Company in terms of how they could proactively prevent the security crisis, instead of simply reacting to the incident by releasing statements to the publics.

UO15

Cyberbullying: Frequency, Impact, and Prevention, *Courtney Adams Dupree, East Carolina University, Greenville, NC*

Life is full of conflicts, some which can lead to positive results and others that can only result in negative outcomes. Among the various types of conflicts humans are faced with each day, bullying is nothing new. Bullying occurs in

many different forms, one of the most ubiquitous of which is cyberbullying. To better understand cyberbullying, research is needed to show exactly what cyberbullying is and provide a clear definition. This paper will examine the prevalence of cyberbullying and its effects on individuals. Methods of preventing cyberbullying will be discussed. It is vital that individuals of all ages be educated on cyberbullying and its effects. A thorough understanding of cyberbullying can produce a stronger sense of its impacts and how to create approaches to cyberbullying prevention. Although completely preventing cyberbullying may seem unrealistic it is possible through awareness and knowledge to reduce its presence and limit its negative effects. It is clear that researchers, parents, students, scholars and popular press see cyberbullying as a serious threat to society and seemingly are all in favor of putting an end to such a destructive phenomenon. Research shows the degree in which cyberbullying effects society, and although this phenomenon will not end tomorrow, education and awareness should begin today.

UO16

Investigating and Sharing the Stories of Our Community's Heroes, *Jessica K. Jewell, East Carolina University, Greenville, NC*

This short documentary shines a light on Greenville Fire-Rescue, its daily operations, and the men and women who serve the Greenville community from behind the scenes. Greenville Fire-Rescue follows a nationwide trend in combining firefighting and emergency medical services (EMS) into one department, meaning no worker is just a paramedic or a firefighter. This documentary follows Greenville Fire-Rescue workers in the field on fire and EMS calls, training and working at the station, and solidifying the bonds that characterize the family they have formed with each other.. All video footage and interviews were shot during volunteer ride-alongs on ambulances and fire trucks with two Greenville Fire-Rescue stations. This piece showcases the history of these departments, the tasks of its workers, and the emotions experienced by those dedicating their lives to saving others. The purpose of the documentary is to provide a unique perspective into the rarely shared culture of the men and women heroically serving the Greenville community, beyond the stereotypes of the general public and information the media shares. The components in this documentary bring life to a necessity that is all too often trivialized or taken for granted by those it serves. Here, through video, I explore not only what the Greenville Fire-Rescue workers do, but also how they do it, and more importantly why they do it.

UO17

Instrumental Music of the Middle Ages: Examining the Evidence Critically, *Trevor L. Rupe, Dr. Kevin N. Moll, School of Music Faculty, East Carolina University, Greenville, NC*

Modern society's understanding of music is fundamentally instrumental. During the Middle Ages, however, vocal traditions ruled over the realm of music. This fact leads to the question of how instrumental music fit into medieval society and culture. The problem of determining the nature and resources of instrumental performance during the Middle Ages is that instrumental music of that time was largely memorized and passed down aurally. As a consequence of this aural tradition of transmission, instrumental music was never written down until around the thirteenth century. The lack of certainty about what instrumental music was actually like, deriving from the lack of notated examples, hinders modern efforts to determine basic aspects of its styles, forms, and performance practices. Its general role in society, however, is somewhat better known from the existence of court and civic records.

This presentation will inquire into the nature of medieval instrumental music through examination of: 1) Types of evidence available to the modern scholar (including Iconographical depictions; notated pieces in musical manuscripts; and archival documentation); 2) patronly venues supporting instrumental performances; 3) classification of instrumental genres based on social function; 4) the instruments and characteristic ensembles of the time and their correlation with uses in society; 5) instrumental styles and the influence of contemporaneous trends in sacred music.

The paper will conclude with an assessment of instrumental music's historical significance during the period c. 1100 to 1350 CE, and its importance in establishing an instrumental tradition that has lasted until today.

UO18

The Music of Now: 21st Century Flute Performance Techniques, *Benjamin A Sledge, East Carolina University, Greenville, NC*

Music is a personal means of expressing emotions and commentating on political and social issues, such as 20th century composer Steve Reich's musical response to 9/11 by layering recorded phone calls from the Twin Towers over a string quartet. The sound and movement of music and the performer create compelling musical gestures that invoke dynamic emotions in the listener. These concepts are prominent in 20th and 21st century music; modern composers ask the performers to break away from traditional use of the instrument to create new sounds and performance techniques. The flute is the choice for many 20th and 21st century composers because of its ability to be versatile and to create sounds with greater freedom than other instruments. Unlike most instruments that go in or have direct contact with the mouth, the flute is played outside of the body, allowing the performer to manipulate sound through air direction and mouth placement (embouchure). I will present a concert of

20th and 21st century solo flute music, rarely performed collegiately. This concert, including music from Luciano Berio and Brian Ferneyhough, will explore the full ability of the flute and compositions for it through pieces with experimental notation, technical virtuosity, and prerecorded electronics. I will also premier my own composition exemplifying these qualities. Through this performance, the audience will be exposed to the unique ideas in modern flute literature as well as the distinctive colors (tone quality) of the instrument. Detailed program notes included with the performance will also allow the audience to understand the political and social background of the composer and the piece of music. I hope to increase awareness and interest in modern music and composers by this public community concert.

UO19

Sonic Plaza Documentation, *Ethan A Garner, Jacob Leo Talley, Jewelry J Redmond, Sarah L Martinez, Michael Ashby Abshire, Mohamed Ali Saleh East Carolina Univiersty, Greenville, NC*

The Sonic Plaza is an art project that was a 30 million dollar art project that was given to the campus by the North Carolina Arts Council under the Artworks for State Buildings Program in 1997. The Plaza is composed of acoustic columns, water wall, clock tower, and fog cloud. The artist who oversaw the construction did not document the electrical systems of the art. It has been requested that the system have a complete overhaul so that the students can better interact with the artwork. The pieces of art, are electronically controlled and the schematics have never been documented. This makes repairs and operation costly. The outdated electrical system is in need of optimization, and documentation so that the operation of the art work is optimized. It has been requested that the hardware and software of the current configuration needs to be updated. The current capstone project that we are completing, is to document the current state of the sonic plaza. This should include schematics, wiring diagrams, detailed components list, and documentation. This will allow future students to better optimize the system.

UO20

Time Study and Analysis on Body Shop Process, *Adam E Ward, David Gbamele, Jesus Lucena, East Carolina University, Greenville, NC*

At Hastings Ford, once a car and estimate have entered the shop workers are on a time line and budget. In order to stay on track and in budget Hastings ford would like to do time study analysis on the processes and see if there are any areas where they can improve. The overall goal is quality and customer satisfaction. For every day that the customer is not back in their own car insurance companies have to pay for the customer to drive a rental car which costs more money if the customer's car is not completed on time. The problem that Hastings Ford is facing is how to maximize the amount of space and workers that they have so that vehicles

can be repaired in a timely manner as specified by the insurance company, (customer). We would like to determine if there are any ways we can redesign or maximize the process currently being used at Hastings. We would also like to look at the facility and suppliers to see if there are any ways we can reduce time.

UO21

Optimizing recycling and disposal procedures for shipping pallets at Grady-White Boats., Robert Blake Wise; Co-Mentor : Jim Hardin, East Carolina University, Greenville, NC

For my presentation I chose Grady-White Boats because of their reputation for excellence. When teaming up with them we wanted to come up with some ideas to help Grady-White Boats improve on efficiency. We realized that the disposal of the pallets that were being shipped in daily was just hurting them due to the labor cost, the dumpster rental, hauling it off to the dump, and the lack of space to store the pallets. We decided we would create a cost and benefit analysis and see if buying a wood chipper to dispose of the pallets would be worth the price, time, and effort. The study will give data on what they are spending now and what the chipper would cost them, save them, and how long it would take to receive an actual return on investment. This is a growing problem for their company, and we want to team up and create a solution for it.

UO22

What is the most efficient location of the new visitors center in the Lake James State Park?, John Michael Kuhlman, Nicholas Antonio Abbondanzio, Jessica Lynn Staton, Robert A. Chin, Anuradha Mukherji, East Carolina University, Greenville, NC

The United States has the largest incarcerated population in the world, and with that it also has the largest population of citizens with criminal records and the stigma associated with these records. The stigma encountered by ex-offenders is thought to contribute to the high recidivism rates currently observed through blocking opportunities for advancement in conventional society (i.e. attaining a formal education, acquiring and maintaining steady employment, and the ability to move into better areas). Pager's (2003) work found that individuals with a felony conviction were half as likely to receive an interview or call-back regarding employment as individuals with no felony convictions. Beyond this finding she also observed significantly lowered odds of receiving an interview or call-back based upon race. Pager's work ultimately demonstrates the impact that the mark of a criminal record can have on employment. While previous research has noted the existence of negative stigma, little research has been conducted to examine potential methods for reducing the stigma ex-offenders face upon re-entering society. In conventional society the most common method for securing stable employment is attaining degrees in formal education. While education has long been associated with the pathway to the American dream in conventional society, it is unclear as

to whether education can erase or at the very least mitigate the mark of a criminal record. Using audit study methodology, we seek to answer the question of whether the level of education matters in securing employment for ex-offenders. We expect to show a positive correlation between the level of education achieved by ex-felons and their chances of gaining stable employment, with the hopes that our research could help divert funds towards educating individuals who have minor records instead focusing on incarcerating them.

UO23

Southern Methodist Missionaries in the Belgian Congo: Christianized Imperialism in the Heart of Africa, Jonathan Blake Richards, East Carolina University, Greenville, NC

The Southern Methodist Missionaries' educational work in the Belgian Congo, specifically the Wembo-Nyama station, dramatically weakened and altered the Congolese's traditional order and culture, while these interactions also influenced a growing sense of nationalism among the Congolese until the time of independence.

Catholic and Protestant missionaries were virtually the only religious missionary groups in the Belgian Congo (1908-1960), with the Catholics having the majority of the mission stations. Christian missionaries provided Africans with the only educational system in the Belgian Congo until the time of independence. The central argument of this paper is that these missionaries altered the Congo's traditional order and culture by destroying or significantly weakening polygamy, traditional religion, and rituals. This alteration caused missionary-educated Africans to become largely independent and distant from their local ethnic groups by embracing westernized education and Christian ideology. This phenomenon created a Congolese dependency and commitment towards the missionaries because many of them abandoned their ethnic ties in exchange for a westernized education and occupations. The missionaries taught Africans the colonial language (French), convinced them to embrace the teachings of Christianity, and condemned their ethnic culture as evil, which effectively destroyed their traditional ethnic values and culture. Missionary education was also a leading factor that caused the rise of nationalism among Congolese, as the majority of the nationalist leaders attended a missionary school and used their western education to oppose the colonial rule.

My research seeks to investigate the nature of missionary education available to the Africans at a specific station in the Congo and explain how these schools changed the lives of Africans more generally. This paper will specifically look at the Wembo-Nyama station and the missionary work of Lorena Kelly, who was a teacher at the station. The station is located near present-day Lodja and specifically dealt with the Tetela ethnic group. The station had a Normal, Bible, and Primary School. The Normal School educated and certified future African teachers who would work in the missionary stations and rural schools, the Bible School instructed future African priests, and the Primary School provided adolescents with basic education.

UO24

The Training and Decisions of King Leonidas, *Jessica Ann Rassau, East Carolina University, Greenville, NC*

The Battle of Thermopylae produced a series of difficult choices that required King Leonidas of Sparta to make controversial decisions. He was born into a strictly controlled militarized society with a structured social system. Leonidas attended the unique educational system of Sparta called the ag^g that had ritualized practices dedicated to the development of elite warriors. The unique practices of the ag^g were extremely successful in developing a belief system for the students which they would maintain throughout their life and which would impact all of their decisions. Leonidas's decisions to act in a warrior's mindset rather than that of the prescribed king's mindset is, I argue in this paper, to be attributed to his attendance to the ag^g and the ritualized practices of that system.

UO25

The Globalization of Medicine: A Look at Ayurveda's Increasing Presence in Biomedicine, *Mansi Trivedi, Derek Maber, Department of Religious Studies, East Carolina University, Greenville, NC*

This thesis examines the rich history, principles, and methodology of the traditional Indian medical system called Ayurvedic Medicine, how it is being adapted through its contact with biomedicine, and how it is presently being practiced, both in India and abroad. The earliest evidence of healthcare in India can be traced to the Dravidian civilization of the Indus River Valley more than 4,500 years ago. However, the written origins of Indian medical practices emerge out of the earliest primary texts of Hinduism compiled about 3500 years ago. It is in these texts that the central concepts of the Ayurvedic system are first mentioned, including the three doshas or humors, dimensions of the body that must be in balance in order for a person to experience good health. Subsequent Hindu scriptures consider how health and spirituality are related to each other and reveal the historical development of Ayurvedic medical principles. It is from this religious context that Ayurveda emerges as a systematic medical tradition in India approximately 450 BCE.

Ayurveda has proven to be a dynamic tradition, responding to ever-changing cultural influences and historical movements. However, as new practices are assimilated into the tradition, old ones are preserved or adapted. As a consequence, Ayurveda has remained current and meaningful to people throughout the centuries, and it has endured as a medical practice in India for over 2,500 years. More recently, the mutual influence and convergence of ideas between cultures and religions has led to the globalization of medicine. The increasing mutual influence between Ayurvedic medicine and biomedicine provides a fascinating case study of such intercultural exchanges. In this study, I will explore these interactions through the examination of Ayurvedic practices and principles relating to reproductive medicine, both through textual analysis and field research in India and the United States.

UO26

Medical Student Stress and Stress Management, *David Michael Sager, East Carolina University, Greenville, NC*

Existing research in the United States shows high levels of stress and burnout in medical professionals, particularly compared to random samples of other working adults. High levels of stress affect not only the health of medical professionals, but also the health of their patients, by reducing quality of care. Researchers have hypothesized that burnout may have its origin in medical school, but little research has examined stress levels or personal practice of stress management (SM) across medical school. Further, examination of sex and racial/ethnic differences across such data may enhance understanding of this issue. Addressing these knowledge gaps is crucial for improving student well-being, rectifying student sex and racial/ethnic disparities, reducing future burnout and error rates, and improving patient outcomes. The current study examined stress and SM across medical school, by year, sex, and race/ethnicity. The method of investigation involved a cross-cohort (years [M]I-4) survey of students from a southeastern medical school to assess variables of interest by established measures. Single items assessed stress level (0-4 scale) and SM frequency (0-3 scale). Out of 320 students, 236 participated (74% response rate). Sample demographics: 50% male, 71% White, Mage=26 years. Stress levels were "moderate" ($M=2.2$) and SM was practiced "sometimes" ($M=1.9$). ANOVAs revealed significant MI-4 differences in stress, $F(3,227)=6.0$, $p=.001$, and SM, $F(3,228)=7.6$, $p<.001$. Post hoc analyses showed stress for M1 and M2 students ($M=2.4$) was higher than that of M3s ($M=2.0$, $p=.08$, $p=.06$) and M4s ($M=1.9$, $p=.005$, $p<.001$); and SM for M1s ($M=1.8$) and M2s ($M=1.5$) was lower than that of M3s ($M=2.1$, $p=.06$, $p=.07$) and M4s ($M=2.1$, $p<.001$). ANOVAs revealed men ($M=2.0$) had significantly lower stress than women ($M=2.4$), $F(1,204)=10.2$, $p=.002$, and White participants ($M=2.1$) had significantly lower stress than minority participants ($M=2.5$), $F(1,214)=6.1$, $p=.01$. SM and stress negatively correlated ($r=-.15$, $p=.02$). Lower stress in M3-M4 may be attributable to the coinciding change from classroom- to clinic-based learning, increased SM practice, and/or adjustment over time. Alternate explanations may include cohort differences or underreporting of stress by male students. Medical education directors may wish to consider methods for increasing SM training during MI-M2, and providing additional attention to SM training for female and minority students.

UO27

Teacher Perceptions of Physical Education in Head Start Preschool Classrooms, *Madison Kay Keesling, Carrie Downing, Virginia Carraway-Stage, East Carolina University, Greenville, NC*

Purpose: Exposure of preschool children to physical activity is crucial for achieving higher academic standards, improving motor skills, and preventing obesity. Teachers play a pivotal role in assuring children receive adequate exposure to physical activity. The purpose of this research was to investigate Eastern North Carolina Head Start (HS) preschool teachers'

perceptions of PE in the classroom.

Methods: Researchers conducted in-depth, structured interviews in May-June 2014 with HS preschool teachers. Interviews were transcribed, coded, and analyzed for the presence of recurring themes following phenomenological methods and the theory of IMB (Information, Motivation, Behavior).

Results/findings: Content analysis indicated PE occurs both formally (planned, structured) and informally (impromptu, casual), totaling to a minimum of one hour each day (only requirement known by every teacher interviewed). Guided by the IMB theory, researchers identified the presence of informational (e.g. knowledge of PE for preschool children, confusion between PE and nutrition education), motivational (e.g. value placed on health, childhood obesity prevention), behavioral (e.g. ability to integrate PE into academic lessons), and environmental (e.g. limited resources/space/time, unengaged parents, limited child attention span) factors affecting preschool teachers' ability to effectively teach PE in the preschool classroom.

Conclusions: Findings indicated teachers may need additional training related to PE with an emphasis on PE requirements and clarification of the difference between PE and nutrition education. Alternatively, emphasizing the importance of PE and its ability to significantly impact the health of preschool children may enhance teachers' motivation to conduct PE more frequently. Addressing potential barriers (e.g. limited resources) and increasing facilitators (e.g. content integration) under the IMB theory may improve teachers' ability to successfully incorporate PE in the preschool classroom. Results will be used to inform future PE interventions in the HS preschool classroom. Understanding teacher-related factors as its related to the IMB theory may improve young children's long-term health-related behaviors through increased access to quality PE.

UO28

Improving On-Task Behavior of Minority Middle School Students Using Leadership Modeling, Motivational Interviewing, & Group Contingencies, Adam Johnson, Perryn Johnson, Leigh Patterson, East Carolina University, Greenville NC

Students in 7th grade classes were exhibiting high rates of off-task and disruptive behavior in a middle school located in a rural, high minority, low socioeconomic area of eastern North Carolina. Attempts to get teachers to provide evidence-based class-wide interventions (e.g. group contingencies) were unsuccessful. Thus, this project involved using undergraduate minority college students and middle school students serving as role models and implementing group contingencies to improve the classroom behavior and academic performance of 7th grade students in this middle school. Group contingency intervention is a system where the delivery of a reward is contingent on the behavior of one or more students in a group (Heering & Wilder, 2006). The strengths of group contingency programs are their ability to use peer influence to guide classroom behavior, the versatility to create novel contingencies based on a group's needs, and the ability to target specific behaviors across a classroom setting (Gresham & Gresham, 1982).

Students who were referred for counseling due to high rates of off-task and disruptive behavior, as well as students observed to be more frequently on-task than others in their class, were selected to be leaders in a group that would be modeling on-task behavior and reinforcing other students for engaging in on-task behavior. Using motivational interviewing, students in this leadership group were asked by the two minority undergraduate psychology majors to rate how important changing their behavior was and how confident they were that they could be successful at changing their behavior. They were also assisted in completing a decision balance worksheet on which they listed the pros and cons of changing their classroom behavior. Group contingencies were used to reinforce students for improved behavior providing points that were exchangeable for rewards such as: wrist bands, gym day, etc. An intensified-treatments research design was used to evaluate the effectiveness of the group contingency intervention. On-task behavior was observed and measured through the various phases of the research study. It was hypothesized that, systematically, as the group contingency intervention became more intense, it would provide greater improvements in student classroom behavior. Additionally, pre-intervention and post-intervention grades of the 7th grade students were compared. Data collection is ongoing and results and their implications will be discussed.

UO29

Reported Dietary Intake and Physical Activity of Boys and Girls Club Members in Pitt County North Carolina, Allender Lynch, Virginia Carraway-Stage, PhD, RD, Jason Brinkley, PhD, and Melani Duffrin, PhD, RD, East Carolina University, Greenville, NC

Reducing health disparities among minority and underserved children is a multifaceted and complex issue. Nutrition and physical activity assessment can inform health promotion interventions aimed at impacting these populations. Using a modified version of the School Physical Activity and Nutrition (SPAN) survey, researchers collected data from 5 Boys and Girls clubs in Pitt County, North Carolina (N=191). Researchers identified the clubs as Ayden, Jarvis, Minges, Farmville, and North Pitt. Descriptive statistics, Mann-Whitney U, and Kruskal-Wallis were employed to analyze data using the SPSS 22.0. With regards to dietary intake, respondents reported the number of times they consumed the particular food items the day before. In general, all clubs reported over consumption of processed/red meats, fried foods, cheese, and chips. In addition participants reported a low consumption of fruits and vegetables. No significant differences ($p<.05$) in dietary intake and physical activity were indicated between 4 of the 5 clubs. The club located in Ayden had significantly higher milk, bread, vegetable (starchy and green), and fruit intake in comparison to the Farmville club. The Ayden club also had significantly higher milk intake compared to the Jarvis club and white bread and starchy vegetables intake compared to the Minges club. Differences between Ayden and the other clubs are most likely explained by existing programs within the clubs. While data indicates numerous areas for potential interventions, immediate interventions targeting reduced fat intake are warranted.

UO30

Beliefs about the rehabilitation of aggressive canines, Destiny Machell DeHart, East Carolina University, Greenville, NC

The topic of canine aggression, threatening or hostile behavior involving actual and or potential harm to another, invokes many emotional responses due to the often violent connotations regarding these animals. Research focusing on various methods of rehabilitating have indicated a range (various) of success rates and statistical findings in regards to aggressive dogs. Using a survey form, I propose a correlative study between current research statistics and public opinions, understandings, stereotypes, and personal experience of canine aggression in the Greenville, NC area. By inviting, through email, former Pitt County Animal Shelter adopters to participate in a public online survey, I hope to answer the following questions: do respondents known to be sympathetic think that a dog can be rehabilitated, think that treatments are available in their area, and what are the stereotypes about aggression and rehabilitation? Following this analysis, comparisons will be made concerning: 1) the amount respondents are willing to spend on an animal compared to the average price of treatments, 2) respondents expectation of success compared to current research findings, 3) perceptions that age, breed and sex of dogs impacts rehabilitation success rates compared to current research findings, and 4) a comparison of personal success statistics to research success rates.

If my survey data yields statistical findings reflexive of current research norms, then we can see that there is no gap between scientific findings and social applications, but if there is a significant difference in my findings and that of current research I propose that there is an unfortunate gap between science and social practices, application of knowledge, and public resources in the area of canine aggression.

UO31

Using an Anthropological Framework to Evaluate the Effectiveness of NGOs in Promoting Change: A Close Look at Witness for Peace in Colombia, Angela Abigail Krider, East Carolina University, Greenville, NC

Cocaine production and the Revolutionary Armed Forces (FARC in Spanish) are the topics that come to mind when mentioning the country of Colombia. Yet Colombians themselves are more concerned about decades of brutal civil war and the second largest population of displaced persons in the world. All aspects of civil society in Colombia are affected by this internal conflict. Most US citizens are unaware of this humanitarian crisis and the role of US policies in this conflict. To overcome the lack of awareness, nongovernmental organizations (NGOs) in the US offer American citizens an opportunity to understand. Their mission is to support peace, justice, and sustainable economies in the Americas by changing US policies and corporate practices contributing to poverty and oppression. The NGO, Witness for Peace (WFP) emphasizes awareness by bringing individuals to experience and witness how local communities

are directly affected by military aid, Free-Trade Agreements and forced displacement. WFP partners with local NGOs formed by communities as peaceful alternatives to violence. American observers participate in the daily lives of local people and stay with local hosts. WFP concludes the delegation by taking the volunteers to meet with U.S. Embassy officials to discuss their experiences, concerns and newly gained insights.

In 2014 I participated in a two week WFP delegation with 11 other volunteers. As an anthropology student I am interested to understand how WFP and local NGOs could benefit from future anthropological research. Such research emphasizes context; it aims to share cultural practices and actively understand how societies co-exist and interact; it promotes understanding a society through its culture (values, beliefs, and rules of behavior shared by group members and transmitted by learning). This approach can advance the goals of US based and local NGOs by allowing visitors, supporters and adversaries experience Colombia as the locals do. Adopting an attitude of cultural relativism and obtaining an emic understanding of why local people do what they do enables discoveries of suitable solutions. In this paper I evaluate the accomplishments of the delegation in light of anthropological teachings about intercultural contact and indigenous cultural concepts; discussing contributions anthropological theory and ethnographic research methods could make to WFP's mission of creating awareness among observers and local NGOs quest to create lasting peace."

UO32

Consumer acceptance of guacamole with added whole soybeans compared to guacamole made without soybeans, Kristi Noelle Wilkerson, East Carolina University, Greenville, NC

This study determined the consumer acceptance of guacamole with added whole soybeans compared to guacamole made without soybeans. The purpose for adding the whole soybeans was to increase the amount of iron in a traditional guacamole recipe. Using a researcher developed scorecard, 79 untrained consumer panelists rated the overall appearance, color, taste, texture, aftertaste, and overall acceptability of the two guacamole samples. Descriptive statistics and independent t-tests were utilized to analyze data using the Statistical Package for the Social Sciences (SPSS) 22.0. Independent t-tests indicated the guacamole made with whole soybeans was equally acceptable for appearance, color, and aftertaste. The regular guacamole was preferred over the soybean variation ($p < .05$) for taste, texture, and overall acceptability. Efforts to incorporate whole soybeans into traditional recipes will continue to promote the health benefits of soy in the diet. Additional modifications to the recipe to improve the preference towards taste, texture, and overall acceptability are warranted.



UP1

An Analysis of Employment Preferences: A Study of Marriage and Family Therapy Students, *Sarah Elizabeth Christian, East Carolina University, Greenville, NC*

The objective of the project is to better understand the perception of Marriage and Family Therapy students about employment opportunities with small businesses versus larger corporations. After undergoing IRB approval, this survey was sent out to Marriage and Family Graduate Programs across the country. Students were asked to complete this survey based off of their employment preferences upon graduation. These students were in either their first or second year of graduate school, and soon entering the workforce. The study is designed to test if these upcoming therapists want to go into small practices, or if they ultimately want to go to a larger practice, where they could potentially receive greater compensation. The results from our sample found that students agreed that if you wanted higher levels of compensation, job security, and greater fringe benefits then you would pursue employment in a large company. However, the results also showed that small businesses provided better managerial relationships, offered more responsibilities, and greater involvement in decision-making. The implications of these findings are further discussed.

UP2

Comparing the Quality of Media Coverage in Democratic Elections, *Hannah Elizabeth Leicht, East Carolina University, Greenville, NC*

This research study looks to determine the varying quality of election coverage in democratic nations. Articles from USA Today and The New York Times that covered the 2012 presidential election were used to study media quality in the United States, The Daily Telegraph and The Guardian provided coverage of the 2010 British election, and The National Post and The Globe and Mail were used to examine coverage of the 2011 Canadian election. The articles chosen from these newspapers provided election coverage from one month before the respective election days. A comprehensive list of terms and phrases denoting high or low quality media coverage was used to compare the quality of the newspapers from each nation.

UP3

CouchSurfing and the Experience Economy, *Allison F. Wiles, Dr. Alleah Crawford, School of Hospitality Leadership, East Carolina University, Greenville, NC*

The tourism industry is driven on intangible experiences. The needs of guests are changing as they continue to seek unique experiences, enhancing the overall satisfaction of a guest's experience. CouchSurfing is a new phenomenon in the travel and tourism industry. Created in 2004, the

social media platform connects hosts with surfers needing places to stay across the globe. While recent studies have looked at CouchSurfing, they have not focused on its place in the experience economy. According to Pine and Gilmore (1999), value is added to services to create a higher value in experiences. Based on the level of the guest's participation and engagement, the level of satisfaction varies. The four realms of experience are entertainment, educational, escapist and esthetic. Therefore, the purpose of this study is to develop a better understanding of CouchSurfing and its role in the experience economy by examining which of the quadrants CouchSurfing best fit. The study also identifies important aspects and impacts of the CouchSurfing experience.

Citation

Pine, B., & Gilmore, J. H. (1999). *The experience economy: Work is theatre & every business a stage*. Boston: Harvard Business School Press.

UP4

Trend and Disparities in Fruit and Vegetable intake among NC adults., *Shannon L. Vucich¹, Oyinlola T. Babatunde¹, Satomi Imai²*

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Extensive research has shown the correlation between fruit and vegetable intake in the prevention of chronic diseases (Hartley et al., 2013, Boeing et al., 2012). However, there are ethnic and/or racial differences in consumption. Minority groups (non-Hispanic blacks and Hispanics), are at a greater disadvantage than non-Hispanic whites when it comes to access and intake of fruits and vegetables (Harris et al., 2014). Literature also shows that social support, socioeconomic status, cultural values, and availability play a crucial role in consumption of fruits and vegetables (Basurto-Davila et al., 2008). The purpose of this study was to examine the trend and disparities in intake of fruit and vegetable (F&V) among North Carolina (NC) adults below the age of 60. Data for this report was from the 2002-2009 NC Behavioral Risk Factors Surveillance System (BRFSS) dataset. Data were analyzed using SPSS Version 22.0 with statistical significance set at the p<0.05 level. Descriptive statistics and confidence intervals (CI) were computed to establish differences in daily consumption of F&V. Trends and difference in daily consumption of F&V are distinguished by analysis on intake of < 3 servings/day and >/= 3 servings/day. Cross-sectional data was collected from a total of 36,850 NC adults below the age of 60 (27,831 non-Hispanic whites, 6,776 Non-Hispanic blacks, and 2,243 Hispanics). Trend shows percent of NC adults under 60 consuming >/=3 servings of F&V per day decreased over time, from 59% (95% CI=56.32-60.72) in 2002 to 56% (95% CI=54.28-58.24) in 2009. Overall, consumption of >/=3 servings per day of F&V is below 60%. When stratified by race/ethnicity, consumption of >/=3 servings of F&V per day increased in all groups except for non-Hispanic White, which decreased from 63.12% in 2002 to 57.38% in 2009. Despite the decrease in trend observed in non-Hispanic white, intake among ethnic minorities is still very low compared to their white counterparts in consumption of >/=3 servings of F&V per day.

The results suggest the need for creative strategies to motivate adults, particularly these minority groups to increase consumption of F&V intake and reduce risks for chronic diseases such as heart attacks, stroke, diabetes, and cancers, which are prevalent among them.

UP5

Does Stalking Stigma Depend Upon Relationship Phase?

Martha Ann Ervin, Amy E. Lyndon, Ph.D., East Carolina University, Greenville, NC

Stalking victims may be similarly stigmatized as other intimate partner violence (IPV) victims. As people stigmatize and blame victims for returning to an abusive partner (e.g., domestic violence victims), people may also blame stalking victims for reinstating the relationship with their stalker (Dunn, 1999; Emerson, Ferris, & Gardner, 1998; Yamawaki, Ochoa-Shipp, Pulsipher, Harlos, & Swindler, 2012). Further, it is hard to draw the line between stalking and courtship because stalking behaviors are often normal in relationship initiation (Emerson, Ferris, & Gardner, 1998). The same behaviors may be seen as normal or desirable during courtship, but as negative or even frightening after a relationship (Dunn, 1999; Sinclair & Frieze, 2000). The purpose of this study is to investigate the extent to which people may judge stalking behaviors consistently with intimate partner violence myths, (e.g., minimizing the situation, victim-blaming, and perpetrator-exonerating) depending upon the status of their relationship. We hypothesize that 1) when the victim returns to the abuser, the victim will be blamed more than those who do not return, 2) the perpetrator will be exonerated more when trying to initiate or reestablish the relationship than in a relationship or broken up, 3) the situations will be highly minimized as not stalking in courtship and after the relationship has been reestablished than in a relationship or broken up, and 4) people who endorse stalking myths will blame the victim, exonerate the perpetrator, and minimize the situation more than those who do not endorse stalking myths. We anticipate having 400 participants and will use MANOVAs test our hypotheses.

Latinos in NC is cancer, followed by heart disease and stroke. Hispanics also have substantially higher rates of barriers to accessing healthcare due to lack of health insurance and financial burden of health costs. Among undocumented individuals, 34% reported health problems and only 5% reported seeking medical attention compared to 12% of documented individuals. The quality of life of Latinos is an emerging area of research, and understanding how this infrastructure impacts their overall health is an understudied area. The overall aim of the study is to investigate how Latinos deal with these barriers and to better assess the Latino's community's health utilization needs. This is a sub-analysis of secondary data that will provide a better understanding the impact that health barriers have on the Latino community, specifically looking at the use of alternative medicines and preventative care. In collaboration with the Association of Mexicans in NC (AMEXCAN) Promotoras de Salud (CHWs), 64 Latinos who reside in Pitt, Nash, Lenoir, and Greene counties were surveyed to help gage their health utilization needs and to assess their already existing health habits and knowledge. Demographics and family health history were also collected and were included in the data sub-analysis. Specifically, preventative care and alternative medicine use in the community will be analyzed based on what is collected. The results from this study will assist us to better understand how the community members use alternative medicines to navigate around health care barriers that are present in their community and create a strategic plan for health promotion and education initiatives for Latino communities in ENC to aid in access to care.

UP6

The Analyzation of Emerging Latino Communities' Health

System Infrastructure, Sydney Lauren Hendricks and Essie Torres, PhD, MPH, East Carolina University, Greenville, NC

NC has one of the fastest growing Latino populations in the nation. In the past, Latino immigrants have settled in areas where there are established Latino communities, such as Florida. New influxes of Latino immigrants are settling in non-traditional southern states, such as NC. These communities, "new-growth" communities, have a limited infrastructure in regards to a language specific health care system. Conditions are worse in Eastern NC (ENC) due to many immigrants holding an undocumented status, increasing limitations on access to health care, adequate housing, and proper sanitation resources. The NC Minority Fact Sheet (2010) states that 25% of Latinos live below federal poverty level compared to 7% of whites. The leading cause of death among

UP7

A comparison of youth poverty and development initiatives in four Latin American countries, Daren Derel Roy,
East Carolina University, Greenville, NC

Poverty continues to plague the lives of young people throughout the region of Latin America. In Guatemala nearly 1 in 5 children suffer from malnutrition. Nearly half of Colombia's population or 22.5 million people are considered to be living in poverty, and another nearly 6.5 million are on the brink of poverty. For the region as a whole, the rate of poverty is estimated at 33% of the total population. Over the past few decades, the plight of poverty among young people has attracted increasing attention from scholars, policy-makers and organizations, and has been the target of interventions aimed at improving the lives of Latin America's youth. This poster will compare the current situation of youth poverty and detail efforts to address it in 4 countries: Colombia, Ecuador, Guatemala and Peru. Drawing on statistical data and the academic literature, as well as first-hand experience in each of the countries, I will examine poverty in both rural and urban environments and highlight some of the distinct challenges facing children and young people. In addition, I will survey the various non-governmental organizations, non-profits, and government agencies working to eradicate poverty in each of the four countries, assessing the strengths and weaknesses of different strategies. In conclusion, I will offer recommendations based on best practices for addressing the development challenges facing youth throughout Latin America. Through my research, I will aim to address the following questions: What is the current reality of poverty among young people in Latin America? What are some of the causes of poverty in Colombia, Ecuador, Guatemala and Peru? And lastly, what legislation, social movements, cooperatives, programs are serving to improve the plight of young people within the region?

UP8

Islam, Media, and Conflict, Paige Chambers Moorhead,
East Carolina University, Greenville, NC

Islam is often connected to highly conflict-oriented topics in western media. These media messages allow western societies to perceive Islam as a lesser and more violent religion. Since these messages are rooted in emotionalism, exaggerated images of religiosity and religious prejudice they leave the underlying human condition and norms of 300 million Muslims not presented accurately.

This research looks at the content of western media with regards on how to understand Islam, the social implications that antagonistic media messages have on western perceptions of Muslims, and the importance of understanding the religious dynamics in interpersonal intercultural conflict. This is done by analyzing preexisting research on the way Americans views on Islam based on media messages, the cultural links of reporting on Islamic conflict in the Middle East and western media, and by looking at the how the media uses gatekeeping to highlight Islam as an

exclusively violent society. We wish to present at the Research and Creative Achievement Week the importance of replacing the current framework that informs reporting on Islamic conflict with a new framework that will more accurately reflect reality.

UP9

The Relationship Between Preadolescent Body Mass Index and Body Image, Megan Hauser and Elizabeth Wall-Bassett, Department of Nutrition Science, East Carolina University, Greenville, NC

Physical and psychological changes occur during middle childhood and the time preparing for adolescence. Healthy body image is a key factor in developing healthy physical and psychosocial habits among preadolescents. There is more documented research on body image and lifestyle habits among females and interventions to address body image concerns among male adolescents are needed. The purpose of this research is to investigate relationships between Body Mass Index (BMI), perceived body image, and eating habits among males and females during middle childhood, and to investigate if nutrition education lessons can influence body image. Preadolescent children's weight and height was measured using a stadiometer in order to calculate their BMI (kg/m^2) and assess BMI categories (underweight, normal, overweight, obese). An evaluation of children's personal body image using the Gardner 13-figure schematic contour scale and the CDC 13-item body image questionnaire was used before and after nutrition education lessons were presented. Four 30-minute nutrition education lessons focused on healthy eating habits, physical activity, and self-esteem. The anticipated hypothesis that will be presented at the Research and Creative Achievement Week is the inverse relationship between BMI category and perceived preadolescent body image among males pre-and post-intervention, and there will be significant differences between male and female adolescents.

UP10

Knowledge and Attitude Assessment of Nursing Students, Faculty, and Staff Regarding LGBT Issues, Justin Dale Smith (presenting author), Wanda Lancaster (faculty mentor), Cheryl Elbammoumi (faculty mentor), East Carolina University, Greenville, NC

Background: The need was identified by a nursing student regarding intolerance of LGBT issues. A program was provided to assess and enhance awareness, knowledge, and positively impact attitudes of students, faculty, and staff. Does a LGBT specific healthcare training program impact cultural awareness, knowledge, and attitudes toward LGBT individuals for undergraduate nursing students, faculty, and staff? **Methodology:** Electronic clickers were utilized for pre-test and post-test assessment evaluating program effectiveness. **Results:** Comparison of the pre-test to the post-test, fewer students and faculty believed that

sexual orientation and gender identity was an individual's choice. Total LGBT knowledge related to healthcare increased after the intervention. Ninety-nine percent of nursing students at post-test felt they were competent to address sexual and gender identity minorities without prejudice. Discussion and Recommendations for Practice: Findings from this project support the need for inclusion of LGBT content throughout healthcare curriculum. Redesign project questionnaire, establish validity and reliability of this instrument, and work towards implementing our intervention in a formal research project.

UP11

Best Practices in American Indian Student Retention at ECU in Juxtaposition to the UNC System, *Joshua L Griffin,*

East Carolina University, Greenville, NC

At just 0.9% of the undergraduate student population, Native American (i.e. American Indian and Alaska Native) students are underrepresented at most of the universities in the University of North Carolina (UNC) system. Throughout the UNC system, university practices enhancing the recruitment, retention, and graduation of Native American students occur in institutional, student-driven, and unique ways, some of which are common across institutions while others are university-specific, but without much cohesion across the system. Collectively, they have the potential to increase the enrollment, retention, and graduation of Native American students with a wide-ranging assortment of resources from academic assistance and guidance to culturally based events, but these resources have not previously been consolidated for consideration by students, universities, or the UNC system. From personal experience with Native students and upon reviewing literature on the provisions that support American Indian and Alaska Native students, key personnel were identified at each university whom were likely to know about the support measures identified within the literature that might exist at their university. The key problems include a general absence of Native university faculty, a lack of programs supporting language, cultural, and contemporary needs of Native students, and a lack of funding for Native students to overcome economic barriers. Opportunities for academic and personal relationships and cultural programs are the primary sources for Native students to receive support from the UNC system and these opportunities are the foci for study. Website content analysis, interviews with key personnel, and pursuing more contact with other university employees that are recommended by the key personnel were the primary procedures taken for resource identification. This thesis introduces the different resources and identifies the strengths and limitations of these resources in regards to increasing the enrollment, retention, and graduation of Native American students at East Carolina University. This poster presentation will display the different forms of resources found in the UNC system through a book and charts that compare the strengths and limitations of the resources identified at other universities can be useful for ECU and its Native students.

UP12

The Influence of Family Functioning on Medical Self-Efficacy in Adolescents with Sickle Cell Disease, *Stephanie Yaa Agyapomaa Wiafe, & Cecelia Valrie, PhD, Department of Psychology, East Carolina University, Greenville, NC*

Objectives: Medical self-efficacy is defined as an individual's belief in his or her ability to manage aspects of their disease and to lead to desired health outcomes (Edwards, Telfair, Cecil, and Lenoci, 2001). Prior research has related high medical self-efficacy with positive health outcomes in adolescents and adults with sickle cell disease (SCD; Clay and Telfair, 2007; Edwards et al, 2001). There has been a limited amount of research examining factors related to the promotion of medical self-efficacy in youth with SCD. The purpose of the current study is to investigate the influence of family functioning on medical self-efficacy in adolescents with SCD.

Methods: Fifty adolescents (29 females, 21 males) with SCD, aged 12 to 17 ($M=14.68 \pm 1.56$ years), and their guardians were interviewed for inclusion in a larger study investigating the relationship between sleep and pain in youth with SCD. All participants in the study were required to have experienced SCD-related pain within the past year. Guardians of the adolescents reported on the adolescents' age, sex, and SCD genotype. They also completed the Structured Pain Interview for Parents to assess adolescents' SCD-related pain frequency in the past year and the Family Environment Scale to assess family functioning. Adolescents were asked to complete the Sickle Cell Self-Efficacy Scale to measure their level of medical self-efficacy. Correlation coefficients and a multiple regression were calculated to examine the relationship between medical self-efficacy and family cohesion, expressiveness, conflict, and independence promotion.

Results: Correlation coefficients indicated that medical self-efficacy was not related to family cohesion ($r=.19, p=.19$), expressiveness ($r=.26, p=0.07$), conflict ($r=0.09, p=.51$), or independence promotion ($r=.14, p=.32$). The model predicting self-efficacy using the family functioning factors was also not significant ($F=0.65, p=0.68$).

Conclusions: These findings suggest that family functioning is not related medical self-efficacy in adolescents with SCD. More research is needed to identify what factors are related to the development of medical self-efficacy in adolescents with SCD. This will aid in the development of programs to promote medical self-efficacy and long term health outcomes for this population.

UP13

Ecclesiology of Dietrich Bonhoeffer, Jason Workman, East Carolina University, Greenville, NC

This study examines the ecclesiology (doctrine of the church) of Dietrich Bonhoeffer. Bonhoeffer deserves attention for his contributions to modern theology and for the courageous life he lived.. His story is one of living courageously by the ideas and values he espoused. A young pastor in Nazi Germany, unlike many, he stood against the Third Reich , a stance leading to death. A brilliant conceptual thinker, yet unwavering in his practicality, he had a great impact in his relatively short life. His theology is difficult to categorize. He is claimed by liberals and evangelicals alike. Bonhoeffer's writings reveal a man whose theology was centered not on traditional notions but on Christ. In claiming him as their own, liberals point to his critique of modern Christianity. In reality, he was simply calling on the church to focus on Christ, while upholding the church as crucial to Christianity and Christians as the body of Christ on earth. His theology of the church and discipleship have impacted modern religious thought. The church, according to Bonhoeffer, was essential to the Christian as well as to Christianity. It was the "sanctorum communio". Every doctrine in Bonhoeffer's systematic theology related to and stemmed from the church.

UP14

Osteoporosis Knowledge and Health Beliefs in a Sample of Older African Americans, Kametria McNeil, Oyinlola T. Babatunde. Department of Nutrition Science, East Carolina University, Greenville, NC

Osteoporosis is a silent debilitating skeletal disease that causes bones to become weak and brittle, which increases the risk for fractures. In addition, osteoporosis is of public health significance due to the increase in incidence, and also the medical and economic impact on the individual, family and society (NOF 2014). Osteoporosis knowledge has been associated with engagement in osteoporosis protective behaviors (Resnick et al, 2014). However, there are disparities in screening, treatment and prevention efforts (Cunningham et al., 2014, Morgan 2010). There is also significant gap in literature with regards to African Americans and osteoporosis knowledge or health beliefs. Several published research on osteoporosis knowledge and health beliefs did not include African Americas or enough to make significant conclusions (Endicott, 2011; Aree-Ue & Petlamu, 2013). It is important to note though the prevalence is low in this minority population group, mortality following fractures is significantly higher compared to other groups. The purpose of this study was to evaluate the level of osteoporosis knowledge among African American adults, 50 years and older, and how it affects their health beliefs. This pilot study included 35 African American older adults, 55-95 years, and mostly (80%) women. Data for the study was collected using previously validated instruments: The osteoporosis knowledge test (OKT), a 24 item survey, and the osteoporosis health belief scale (OHBS), a 42-item

questionnaire with 6 domains based on the Revised Health Belief Model theoretical framework. Demographic data were also collected. Descriptive statistics were used to describe the sample and Spearman correlation tests to examine the relationship between various health belief constructs and osteoporosis knowledge. Osteoporosis knowledge among participants was low (10.89 ± 5.16). There was a significant positive correlation between osteoporosis knowledge and some health belief subscales [perceived benefits of calcium intake ($r=.394 p=.02$) and perceived benefits of exercise ($r=0.435, p=0.01$)]. Findings from this study suggest the need for programs which are culturally appropriate to help this population group understand their susceptibility to osteoporosis and its severity. An increase in osteoporosis education and awareness will help increase general osteoporosis knowledge, which can directly affect various health beliefs and be a motivation to take charge of their bone health.

UP15

Are College Students Color-Blind? Associating Demographic Factors with Latent Racism, Kelsey M Weiss, Melinda D Kane, East Carolina University, Greenville, NC

In the United States, people across social institutions increasingly perceive racism to be a thing of the past. Abundant research, however, demonstrates that racial bias by employers, and others, continues to take place. My study hypothesizes that race and racism still play an active role in shaping other dimensions of our society as well. I am particularly interested in whether or not latent racism exists among undergraduate college students and, if so, what demographic factors are associated with these racial attitudes. I have designed a study that, using correspondence testing methodology, aims to investigate whether there is an association between these students' roommate preferences and latent racism. Each participant in my study, based on their gender, will randomly select one of two fictitious roommate vignettes. On a scale of one to ten, the participant will rate how likely he or she would be to choose said person as their roommate in a real life situation. The vignettes have been carefully matched aside from the names, which will associate the fictitious roommate with being either white or African American. For this reason, aggregate differences in the participants' rankings can be interpreted as being linked to the potential roommate's race. After rating the roommate, the participant will fill out a six question demographic survey. I will quantitatively investigate whether there is a relationship between participants' demographic characteristics and the average ratings of the black and white roommates. Investigating the extent to which latent racism continues to exist is necessary to evaluate the degree to which the prevailing assumption that "race no longer matters" is true. If people continue to perceive equality in an era where prejudice and discrimination continues, we are, in fact, allowing racism to endure. Researching the degree to which subconscious racial inequality continues to exist will allow us to work toward equality.

Evaluating Depression Management for Elderly Clients in Home Health Care, Michaela Layne Atwell, East Carolina University, Greenville, NC

Depression affects 350 million people worldwide and is considered the primary cause of disability internationally (World Health Organization, 2012). Depression often goes underdiagnosed and undertreated in all ages, but even more so in older adults as it may be mistaken for a normal part of aging. (Center for Disease Control [CDC], 2012). Annually, the healthcare cost of depression is estimated at \$43 billion (Geriatric Mental Health Foundation, 2010). The development of depression can result in increased rates of rehospitalization and increased risk for cognitive decline and mortality, including suicide (Geriatric Mental Health Foundation, 2010). In 2007, more than 1 million adults age 65 and over received home health care services each day (CDC, 2012). One in seven elderly receiving the service meet criteria for major depression, and one in three have clinically significant depression (Bruce, et al., 2011). Home health nurses are responsible for providing 85% of skilled home health care to this population, placing these nurses in a position to serve a vital role in helping these clients through effective screening and management interventions (Brown, Raue, Roos, Sheeran & Bruce, 2009).

This project is being implemented at a home health agency located in eastern North Carolina. The purpose of the project is to compare usual practice with best practice for the identification and management of depression among elderly home health clients. The two project objectives are 1) to explore the current screening tools, processes, and nursing preparation in place at the agency for identifying and managing client depression, and 2) to make 2-4 recommendations, based on findings, to the agency administration and nursing staff. Public health interventions such as collaboration and policy development will be used, and key informants will be the nurses and administrators at the agency. Data collection will address the number of clients within the agency who have been identified with depression, the assessment process and actions taken after identification, and the views of home health nurses regarding their role in, and preparation for, managing client depression. Data will be interpreted, and comparison will be made to methods, programs and interventions identified within the literature. Based on results, information and recommendations regarding new research and programs may be provided to nursing staff within the home health agency by February 27, 2015.

Understanding Health Care Providers' Knowledge, Attitudes, and Practices Regarding HPV Vaccines, Shawna Lynn O'Rorke, East Carolina University, Greenville, NC

According to the Centers for Disease Control and Prevention, Human Papillomavirus is the most common sexually transmitted disease in the United States. There are over 40 types that can infect the genital tract, and 90% of these infections are asymptomatic and subside without treatment. However, infection by certain types of HPV can lead to various cancers and other diseases. A quadrivalent vaccine that targets four of the most prevalent carcinogenic and non-carcinogenic HPV types has been approved in the United states for both girls and boys ages 9-26. Despite such pharmaceutical advances, in 2012, only 53.8% of girls (ages 13-17) received the first dose, and only 33.4% completed all three recommended series. Vaccination rates are even lower for adolescent boys (13-17) with only 20.8% receiving the first dose and 6.8% having completed the series. Lack of provider recommendation is the number one indicator for not receiving the vaccination. Nearly two-thirds of 11 and 12-year-old girls do not receive the HPV vaccine at clinical visits where at least one other vaccine was administered. The main objective of this study is to evaluate the knowledge and attitudes of health care providers towards HPV and HPV vaccines that may be informing these low rates of administration. A brief, 1-page survey was administered to attending doctors and residents in Pitt and Greene Counties. The survey includes questions about patient-provider communication regarding HPV and HPV vaccines, parent-provider communication regarding HPV vaccines, concerns regarding HPV vaccines, and basic demographic information. The information gained from this survey will allow us to better understand the factors that influence provider recommendation, and inform potential educational strategies to improve HPV-related knowledge, attitudes, and practice among providers. It is essential to acquire health care providers' perspectives on HPV vaccination, as provider recommendation is a top indicator of increased vaccine uptake.

UP18

Providing Access to Child Passenger Restraint Information: Is There a Role for Elementary Schools and Daycare Facilities?, *Meredith Kate Edwards, East Carolina University, Greenville, NC*

Despite the many advances that have been made in motor vehicles and child passenger restraints, in 2011, more than 650 children died as a result of motor vehicle crashes in the United States (Centers for Disease Control and Prevention, 2014). The correct and appropriate use of a child passenger restraint system can increase the likelihood of a child surviving a motor vehicle crash and avoiding serious injury. Despite the great benefits of the use of child passenger restraints, many parents do not use them correctly or at all (Macy, Cunningham, Resnicow & Freed, 2014). Many parents lack knowledge about child car safety and the appropriate use of passenger restraints. One barrier that has prevented some parents from the correct use of passenger restraints for their children is not receiving updated information about correct use as their child grows up (Macy, Cunningham, Resnicow & Freed, 2014).

This project is being conducted at an elementary school and multiple daycare centers associated with an early childhood development program in eastern North Carolina. The purpose of the project is to evaluate the need for an ongoing process at the elementary school and daycare facilities that could increase awareness and educate parents and guardians about appropriate use of passenger restraints as children grow. Interest and barriers to implementation will be considered. Two public health interventions used in this project are collaboration and policy development. Collaboration with key informants will include the daycare providers, a child care health consultant, the school nurse, and administrators, teachers and staff at the school. The two objectives of this project are 1) to complete an assessment of current practices for providing educational information to parents and guardians in the school and daycare facilities, and 2) to make recommendations, based on best practices, regarding the feasibility of establishing a process that would provide information on child passenger restraints through these facilities. All information gathered will be compiled and evaluated by February 17, 2015 in order to provide recommendations to daycare providers and school representatives. The overall goal of this project is for parents and guardians to have ongoing access to child passenger restraint information.

UP19

A New Look for Introductory Psychology: Exploring Student Perceptions of An Open Access Textbook, Jacqueline Nicole Glass, *East Carolina University, Greenville, NC*

Introduction: Rising higher education costs and increasingly expensive course textbooks place a financial burden on today's students. A free online textbook (Noba) was developed in 2013-2014 by the nonprofit Diener Education Fund, with each chapter written by an expert in that subject matter. The present study examines student perceptions and understanding in one of the first courses to use Noba in place of a

traditional textbook. Would a free online textbook be just as effective as a hardcopy textbook in teaching students and helping them learn?

Method: The present investigation utilized a validated textbook survey to examine student perceptions of Noba. Students ($N = 22$) also completed a 25-item psychology knowledge assessment. Results from the knowledge assessment are compared with courses using a traditional textbook.

Results: The results of the textbook survey showed that, in general, the size and weight of a textbook generated the lowest value in importance; while price mattered the most with the highest mean value. In addition, the flow of text, examples, and study aids were noted as high value.

Student perceptions of the Noba text suggested that the cost (free) was perceived as one of the primary strengths of the text.

Discussion: It is important to understand what matters to students to better meet their educational textbooks needs. By allowing students to self-report what they most and least valued, we were able to determine what parts of a textbook are most and least important to students. Since costs figures prominently in importance to students, the free, open-access Noba text is positioned to meet this student need.

Date of IRB Approval: June 23, 2014

UP20

The Effects of Social Media on Subjective Well-Being, Amanda Malone, Priya Birdi, Taylor Pentz, Wayne Hall, Kelly Sing, Alexander Schoemann, Derrick Wirtz, *East Carolina University, Greenville, NC*

Introduction : How does social media impact the well-being of its users? Prior research found that Facebook use negatively affected overall subjective well-being (Kross et al, 2013). Limitations of this prior research were its reliance on a single-item measure of well-being and its emphasis on Facebook alone. The present study takes into account both positive and negative measures of well-being, as well as other social media including Twitter and Instagram.

Method: A group of undergraduate students ($N=78$) participated in an experience sampling study. The participants received 5 random surveys a day through email for 10 days. Each survey included questions assessing the respondent's subjective well-being and social media usage, for example, "how often have you been on Facebook since the last time we asked," "how do you feel right now," and "how lonely are you."

Results: Using multilevel modeling, participants' current well-being was statistically predicted from their self-reported social media use, as well as their most recent well-being rating. Current well-being was highly related to participants' prior well-being rating, but not from their social media use. Upon closer examination, we found that while social media use was unrelated to participants' current positive emotions, the more respondents used social media the more negative emotions and loneliness they reported feeling, even when controlling for their prior affect.

Discussion: The current findings suggest that the more one uses social media, the more negative emotions and loneliness they are likely to experience. Social media use does not influence your positive subjective well-being; however it does influence your negative feelings and loneliness. The IRB approval date was 4/14/14.

Evaluating Type I Diabetes Management in an Elementary School Setting, Rebekah Emily Carbone, East Carolina University, Greenville, NC

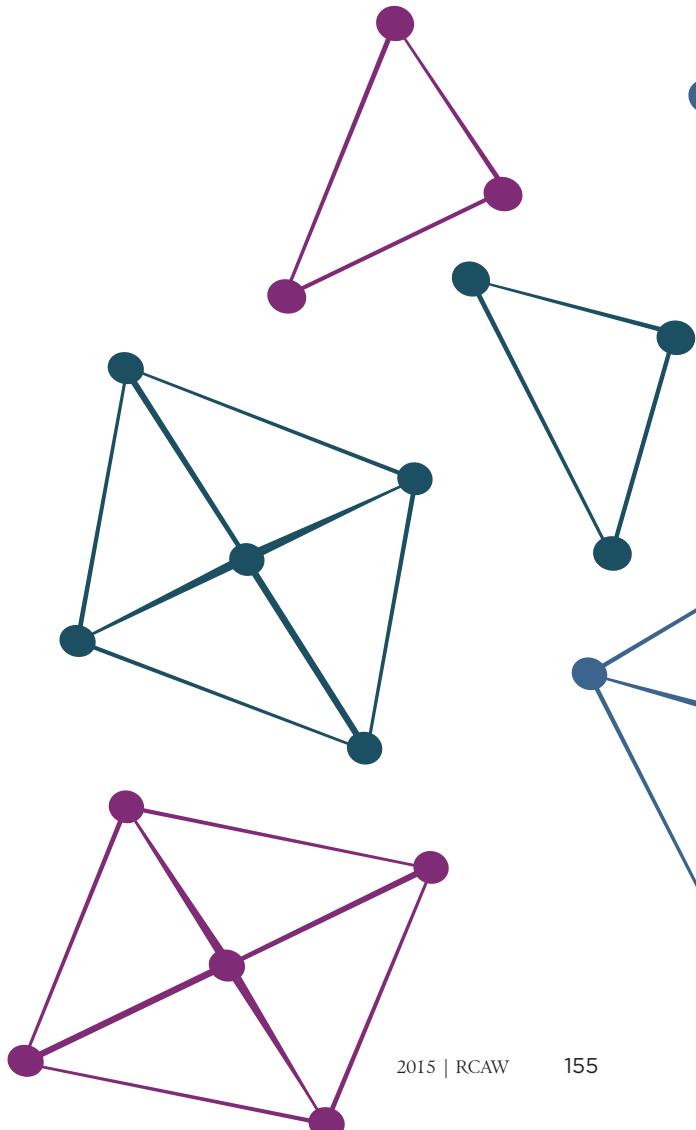
Type I diabetes (TID), is a chronic disease that affects 208,000 youth and children in the United States (American Diabetes Association, 2014). Managing the disease requires intermittent monitoring throughout the day, including checking blood glucose levels, insulin administration, and counting carbohydrates consumed during meals and snacks. It is important that these procedures do not interfere with a child's learning experience during the six to eight hours spent in school each day. Depending on a child's ability to self-manage the disease, some must rely on school nurses and staff to aid in this management. This is especially true for elementary school aged children. The American Diabetes Association (2014) has established guidelines for diabetes management in a school setting. Key aspects of successful diabetes management in an elementary school include: (a) detailed care plans (b) effective training and education for school staff, and (c) clear communication and collaboration between all who are involved.

This project is being implemented in several elementary schools in a coastal North Carolina county. Currently, there are 62 children enrolled who are diagnosed with TID. The purpose of this project is to compare the practices of the county's school nurses and other staff with the guidelines in place by the American Diabetes Association. Public health nursing interventions used in the implementation of this project include collaboration, consultation, and policy enforcement. This project involves working closely with key informants such as the school nurses, nursing coordinator and school staff. Two project objectives are 1) to complete an assessment of diabetes management in the county elementary schools by reviewing care plans, education materials, school health policies, and by meeting with key informants to discuss their involvement with disease management and 2) to make 2-3 recommendations, based on findings, to the county school nurses. By collaborating with school nurses across the county, information will be compiled and evaluated by February 27, 2015 in order to provide recommendations at the monthly school nurses meeting. The overall goal is to ensure that students are receiving excellent diabetes care that does not hinder their learning experience.

Personal Factors Affecting Oral Hygiene, Chloe Simone Strickland, East Carolina University, Greenville, NC

The purpose of this study was to examine the impact of health and mating concerns on oral hygiene. Men and women enrolled in Introductory Psychology classes at East Carolina University were selected to be participants in this two part study. It was hypothesized that participants would increase tooth brushing and flossing behaviors if primed with mating-related concerns. Each participant was asked to bring a tube of toothpaste, which was weighed at the beginning of each meeting. A

container of floss was also provided to each participant. The participants were then randomly assigned to one of three conditions: mating prime, health prime, or control. A control article was provided to participants in every condition during the first session. The control article contained basic tips for good oral hygiene and some dental statistics, making no reference to mating or general health concerns. Over the course of one week, participants were asked to use the toothpaste and floss, and to submit daily reports of their brushing and flossing behavior. When participants returned for the second meeting one week later, their toothpaste tubes were weighed and the remaining floss was measured in order to establish a baseline. Next, participants who had been randomly assigned to the mating or health conditions received a new article. Those in the mating condition received an article emphasizing the benefits of good oral hygiene in relation to romantic/mating goals. Participants in the health condition received an article emphasizing the general health benefits of good oral hygiene. The participants in the control condition were told to refer back to the control article they were given at the previous meeting. All participants were then provided with a new container of floss to use during the following week and they were again assigned to complete daily online questionnaires in order to quantify changes in oral hygiene behavior. After one week, participants were debriefed after a final weighing of their toothpaste and any remaining floss was collected at the last meeting. Results suggest that the health prime caused women, but not men, to use more floss.



UP23

Soviet Animation Before and After Khrushchev's Thaw: Historical and Critical Analysis, *Kyle Ilana Binaxas,* *East Carolina University, Greenville, NC*

Soviet animation holds complex roots that bridge the gap between art and social commentary and is greatly unknown to the West. One of the largest industries of popular culture and Russian identity was enhanced by the presence of animation that reached an audience of all ages and nationalities. Most importantly, Soviet animation held the responsibility to transfer all ideologies of Soviet propaganda and also to compete with popular US animation. However, at the end of the Stalinist period and the rise of Khrushchev's Thaw, a new stylized form of animation arose that took the opportunity to criticize the government, abandoning its competition with US animation and reclaiming their Russian identity. Serving as a backdrop for the animators and their transition from Stalinist ideals to a less strict and more liberating creative process is Soyuzmultfilm, a prominent animation studio that has survived during all phases of Soviet and Russian history. This research focuses on four prominent directors from Soyuzmultfilm and four films. Fyodor Khitruk's "Story of One Crime" in 1962 which highlights the day in the life of an upstanding Soviet citizen surrounded by his rude and "un-Soviet" neighbors and the Brumberg sister's 1961 film "Great Troubles" depict the effects of the West on the Soviet Union, leaving only children and animals safe. After Khrushchev's Thaw, the acclaimed Khitruk then turned against the government and criticized the apathy and self-centeredness of a bureaucrat in 1966 with "Man in the Frame". Andrei Khrzhanovsky's "There Once Lived Koziyavin" in 1966 emphasized the destruction of art, science, and history by the Soviet bureaucrat whose only orders is to continue moving forward. All four films will be analyzed in terms of their historical context, content, as well as critical audience reception including the government and outside general audiences. The importance of evaluating animation is to understand its service as an important historical source of social and political criticism.

UP24

Marketing Development with New Detroit Resto-Mods, *Brendan A Schachte,* *East Carolina University, Greenville, NC*

New Detroit Resto-Mods is a local car restoration business. For this project, I have developed a marketing plan for the business to help them make future decisions on how to increase profits and grow the company. This plan includes such components as a mission statement, SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, and a marketing strategy on how to move forward. In addition, I have also developed several creative aspects, such as a website and logos/advertisements. This combination of both research and original creative designs leads to a unique offering that is able to be applied to a real-life business.

UP25

Channels of Communication: An Analysis of Students' Preferred Methods of Communication, *Kristen Leigh Martin,* *East Carolina University, Greenville, NC*

College students use different channels of communication to stay in contact with friends and family as well as coworkers and classmates. The channels of communication vary from intimate to professional, such as text messaging and email respectively. This study examines the channels of communication used by students enrolled as communication majors at a medium-sized Southern university to communicate within their different networks. The methods of communication were determined through a survey on social media usage and interactions administered to students. These students then participated in a focus group discussion in order to elaborate on results obtained through the survey. When compared the data shows a significant shift amongst students toward intimate channels when communicating with family and peers, and a shift toward professional channels when communicating with professors and other faculty.

UP26

PRESENTATION WITHDRAWN

UP27

Twitter and Sports Communication: The Effect on Athletes, Organizations and the Traditional Media., *Michael A Prunka,* *East Carolina University, Greenville, NC*

Since its advent, Twitter has had a significant impact on sports communication. This essay examines the effect that Twitter has had on athletes, sports leagues and the media itself. It includes a review of recent and relevant literature and analysis of recent events—including the scandal surrounding former Baltimore Ravens running back Ray Rice. Twitter provides athletes, as well as sports organizations, with a direct channel of communication to the public when the media previously acted as a middleman. Athletes now have more control over the image they project. Agenda setting and uses and gratification theories are applied in the explanation of motives for what information is and is not disseminated by sports organizations. This becomes especially evident in case studies on lockouts. Because of this, Twitter has eroded the media's gatekeeping ability. This has led to a shift to what is referred to as "gatewatching." With the traditional media having less control over the dissemination of information, it instead acts as an overseeing entity for the crowd-driven process that Twitter encourages.

UP28

Fresh Eyes: Image Based Social Media, and How Interior Design Students Utilize It, *Nicole Michele Lobell, Jaya Rose, East Carolina University, Greenville, NC*

The dozens of magazines, television shows, online blogs, and other social media sites have created a saturation of images in today's society. This becomes even more prevalent when talking about the field of interior design. With the sheer amount of images available to interior designers, and specifically students as part of the millennial generation, could any one resource be more used than others? Is there a way that image based media is being taken advantage of by students? Image based social media repositories, such as Pinterest and Houzz are thriving amongst young designers, even in the image heavy world of today. Through focus groups and surveys we have explored the use and influence of these sites on students both entering and graduating from an accredited interior design program (Council for Interior Design Accreditation). This poster will explore the relationship between interior design students, and image-driven repositories.

UP29

Influence of Pre-Pregnancy Activity Level on Birth Weight, *Kellie Baker¹, Dr. Linda May²*

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The effects of exercise have long been studied in the general population, but the study of special populations such as pregnant women has been a more recent development. While exercise recommendations for "normal" and healthy populations has been well-established and studied, the recommendations for pregnant women is less researched is a current topic of interest for researchers. In the recent past, women were encouraged not to participate in physical activity for fear of possible complications to both the mother and fetus.

However, current research suggests that healthy pregnant women can abide by the exercise recommendations for the general population.

Exercise during pregnancy lowers blood pressure, improves self-esteem and muscle function, limits weight gain (which decreases the risk of gestational diabetes), and has been suggested to aid in an easier delivery and labor. This research project aims to look at the impact and association of pre-pregnancy activity level as well as activity level during pregnancy with baby birth weight. The groups being compared are the mothers who were active before and active during pregnancy (A/A group), the mothers who were inactive before pregnancy and active during (I/A group), and the mothers who were inactive before and inactive during pregnancy (I/I or control group). Based on current research, I hypothesize that the A/A group will have lower birth weights, while still remaining within the normal and healthy range for birth weight, relative to the other two groups (I/A and I/I).

UP30

Relationship between symptoms of muscle dysmorphia and body composition in high volume weightlifters, *Sarah C Horton, East Carolina University, Greenville, NC*

Muscle dysmorphia is a subtype of body dysmorphia disorder that is characterized by exercise-obsessed individuals who fixate on their muscle size and obtaining a perfect physique, constantly worrying about being too small, underdeveloped, and/or underweight despite maintaining a high muscle mass. Raising the risk for depression and/or anxiety, muscle dysmorphia causes feelings of inadequacy that extend beyond just aesthetics, including school performance, relationships, and friendships, which are usually sacrificed due to their obsession to obtain the perfect physique. Since the majority of previous research has focused on disordered thoughts separate from body composition measurements of these individuals, this project aims to quantify non-invasive anthropometric measurements in healthy and disordered weightlifters to determine methods for identifying individuals at high risk of muscle dysmorphia. ECU has approved the IRB for this study, therefore we have started the recruitment process using flyers that include the criteria and contact information. The criteria that must be met to be involved includes male or female students, weighing at least 71.5 kg, performing resistance training a minimum of 4 days per week for 30 minutes each session from the East Carolina University Student Recreation Center. Subjects are to complete validated questionnaires on training, diet, and characteristics associated with muscle dysmorphia. Participants are expected to undergo non-invasive body composition assessment following the procedures of the International Society for the Advancement of Kinanthropometry to quantify muscle mass, adipose mass, bone mass and muscle to bone ratio. A maximum of 25 subjects will complete testing, providing a pool of subjects with traits of muscle dysmorphia and health controls. We expect that subjects who show traits of muscle dysmorphia will have higher muscle mass, lower adipose mass, and an unhealthy muscle to bone ratio compared to those who do not display disordered body perceptions.

UP31

An Evaluation of Referrals and Follow-Up Care for High Risk Infants, *Lindsay E Caddell, College of Nursing, East Carolina University, Greenville, NC*

The infant mortality rate (IMR) is defined as the number of infant deaths during the first year of life and is the indicator of the overall health of a population (Murphy, Xu & Kochanek, 2013). The IMR in Wayne County, North Carolina for the white population is 4.1 deaths per 1,000 and the minority rate is 17.1 deaths per 1,000 (Wayne County Health Department, 2011). This health disparity is alarming. Maternal and infant risk factors such as, single motherhood, alcohol or drug use, multiple gestation, distance from agency and public insurance coverage contribute to this health disparity. Referral and follow-up programs in the community have been shown to decrease these risk factors and their negative effects on infant outcomes (Broyles et al., 2000). Research shows access and availability are barriers to these follow-up programs (Ballantyne, Stevens, Guttman, Willan & Rosenbaum, 2014).

This project is being conducted at the Wayne County Health Department in eastern North Carolina. Wayne County has a population of 126,000. The Maternal Health Program at the health department provides postpartum home visits to assess both mother and infant within two weeks following delivery. Home-visits to postpartum mothers is an evidence-based intervention that addresses high infant mortality. Most women receiving postpartum home visits in Wayne County are minority clients. Postpartum home visits to mothers and infants routinely result in referrals to community programs and resources for follow-up. Infants and mothers considered high risk are referred to health department and community resources. The purpose of this project is to evaluate the completion of referrals by the recipients of the home visitation program. The three public health interventions utilized in this project are case finding, referral and follow-up, and collaboration. This project is being conducted in collaboration with public health nurses and social workers from community resource organizations. This program evaluation will include data on racial/ethnic group, type of home visit, type of referral, and whether the referral was completed. The objectives are 1) to obtain data related to infant and maternal referrals to health department and community resources after the postpartum home visit, 2) to analyze and interpret this data for program evaluation, and 3) to identify program and service characteristics regarding effective community resources.

UP32

Contralateral Suppression of Transient Evoked Otoacoustic Emissions in Young Adults with Varying Degrees of Musical Experience, *Emma R Daughtrey, East Carolina University, Greenville, NC*

Of all descending auditory pathways, the olivocochlear efferent system has been studied extensively. Two olivocochlear efferent pathways exist: lateral olivocochlear and medial olivocochlear (MOC). MOC and lateral olivocochlear neurons receive auditory innervation and both constitute

pathways of olivocochlear acoustic reflexes. The MOC ipsilateral and contralateral reflexes are best understood. The role of the MOC efferent reflex has been suggested to be fourfold: shift the dynamic range of hearing, facilitate selective attention, protect the ear from acoustic trauma, and reduce the effects of masking noise (Guinan, 2006). The functioning of the MOC reflex can be tested noninvasively in humans through contralateral suppression of transient evoked otoacoustic emissions (TEOAEs). TEOAEs are sounds emitted following acoustic stimulation to short/brief duration stimulus. TEOAEs provide a simple, efficient, and non-invasive objective indicator of healthy inner ear function. Contralateral suppression of TEOAEs refers to a reduction in amplitude of the emission with auditory stimulation of the contralateral ear. This effect is attributed to alteration of cochlear micromechanics by MOC efferents (Maison et al, 1999). While there is some research to support the notion that the amount of musical experience affects MOC neuron function, there are no data to show this relationship on a continuum of experience in music. That is, greater contralateral suppression of TEOAEs is found in musicians with extensive experience there are no studies that have explored the strength of the association across a continuum of musical experience. The present study addresses this relationship. Participants were 18 young adults with normal middle ear function and normal hearing. To examine contralateral suppression, TEOAEs were evaluated with 60 dB peSPL click stimuli with and without a contralateral 65 dB SPL white noise suppressor. Musicianship was assessed with the Brief Profile of Music Perception Skills (PROMS; Law & Zentner, 2012). There were no significant correlations or predictive linear relations ($p > .05$) between the amount of TEOAE suppression and the total Brief PROMS score or subscale Brief PROMS scores (i.e., melody, tuning, speed, and beat). The results from this study support the notion that increased MOC activation, as assessed via TEOAE suppression, is not associated with musicianship.

UP33

Evaluating an Evidence-Based Program that Addresses Childhood Obesity in a Middle School in Rural Eastern North Carolina, *Christina Smith, East Carolina University, Greenville, NC*

Childhood obesity is a growing problem in North Carolina and the nation. North Carolina CHAMP (2013) provides data that shows 17.9% of children age 10-17 were overweight and 13.2 % were obese in 2011. In 2009-2010, data shows that 24.9% of eastern North Carolina children are classified as obese while 17.4% had a BMI greater or equal to the 95th percentile (NCCHAMP, 2013). Genetics, behaviors, and environmental factors contribute to the development of obesity in children. Prevention and management is critical due to the association with various comorbidities and long-term consequences effecting physical, mental, and emotional health. Obesity greatly increases the risk for further health complications later in life such as cardiovascular disease through resulting high blood pressure and high cholesterol levels (Center for Disease Control and Prevention, 2014).

Wayne County, North Carolina is a rural county with a population of

approximately 125,000. The county recently implemented the national program, 5-2-1-0 Let's Go! This evidence-based program reinforces the daily message of eating of 5 fruits and vegetables, watching 2 hours of screen time, getting 1 hour of physical activity, and having 0 sugary drinks (Canterbury & Hedlund, 2013). It is uncertain whether all rural public schools in Wayne County have implemented this national program. This senior honors project is being conducted at a middle school in rural eastern North Carolina, with a population of 444; composed of 34% Latino, 33% African American, and 32% White students. The purpose is to evaluate the implementation of the 5-2-1-0 Let's Go! Initiative. The objectives are to 1) collect, evaluate and interpret the BMI data of a selected group of students 2) interview 3-5 key informants on their role in the 5-2-1-0 Let's Go! Initiative, and 3) observe the school-based physical activity programs. The current approach includes identifying students with a BMI above the 95th percentile and then implementing the 5-2-1-0 Let's Go! Data gathered and analyzed will help determine if the 5-2-1-0 Let's Go! Initiative is reaching all students in this middle school. A written report will be provided to the school administration and the school-based health center advisory board at the end of the project.

UP34

Reducing Maladaptive Sensory Neuronal Growth to Target Below-Level Pain Following Spinal Cord Injury, *Blaire Conner¹, Morgan Rowe¹, Alysha Wonka¹, Kori L. Brewer Ph.D.² and Sonja K. Bareiss Ph.D., PT¹, ¹Departments of Physical Therapy and ²Emergency Medicine, East Carolina University, Greenville, NC*

Chronic neuropathic pain is a common, debilitating consequence of spinal cord injury (SCI). SCI pain is classified as at-level or below-level pain (several segments remote from the injury). Evidence from our lab suggests this pain may be related to abnormal growth of sensory neurons at and below the level of SCI, which is mediated by inhibition of GSK-3. The purpose of this study was to: 1. Characterize the time dependent growth of sensory neurons below the SCI and 2. Determine if activation of GSK-3 could reduce these abnormal growth responses. Long-Evans rats received a dorsal horn injection of quisqualic acid (SCI) or saline (sham operated control) and were sacrificed 1, 3, and 14 days following surgery. At the designated time points, DRGs ipsilateral to the site of injection were disassociated, cultured and analyzed for neurite outgrowth and length. Time course studies show a graded increase in below-level growth responses following SCI. In the second experimental approach, rats received intrathecal delivery of the GSK-3 activator (LY294002) the first 3 days after injury and were sacrificed 14 days following surgery. Intrathecal administration of LY294002, initiated at the time of injury, significantly reduced below-level DRG neurite outgrowth 14 days post-SCI. Additionally, LY294002 treatment prevented the development of below-level hyperalgesia. Based on these results we suggest that GSK-3 may be involved in the modulation of abnormal sensory growth responses following SCI, and might constitute a new therapeutic target to prevent below-level SCI pain.

UP35

Understanding Cultural Self-Efficacy among Medical Students, *Charles Thomas Jauss and Essie Torres, MPH, East Carolina University, Greenville, NC*

Cultural competency has become an integral factor in healthcare over the past couple decades. Cultural competency in healthcare is the ability for a healthcare provider to transcend cultural and linguistic barriers between themselves and the patient in order to achieve equal access and quality of service to promote better health outcomes for all patients (HHS Office of Minority Health, 2013). The most frequently assessed component of cultural competency is the concept of cultural self-efficacy. Cultural self-efficacy is the confidence and belief in one's own ability to interact with and treat patients of various cultural backgrounds adequately and properly. Despite the numerous studies on medical professionals concerning cultural competency and more specifically cultural self-efficacy, there is still a gap in the literature focused on the cultural competency and self-efficacy among medical students. The purpose of this study is to gain a deeper comprehension of the cultural self-efficacy among medical students studying at The Brody School of Medicine at East Carolina University. Particularly, this study aims to understand perceived self-efficacy and cultural competence among medical students based on their previous experiences interacting with different cultures and their beliefs regarding cultural competence practices as future medical doctors. A survey was administered to current medical students including constructs on experience with diverse cultures both within and outside of medical settings, as well as perceived ability and beliefs regarding cultural competency practices with a diverse patient population. The results of this study will expand knowledge on the cultural self-efficacy among medical students and inform potential educational strategies to increase cultural self-efficacy among medical students.

UP36

Understanding the Health Utilization Patterns among Latino Seasonal Farmworkers in Rural Eastern North Carolina, Peace Nwanguma, Christina Martin, Hannah Moss, Dr. Elizabeth Chaney, Dr. Essie Torres, East Carolina University, Greenville, NC

Occupational hazards and immigration/migrant worker status are among the various reasons migrant and seasonal farmworkers (MSFWs) often suffer poor health, as well as, have higher rates of injuries and illnesses. Previous research has identified specific barriers to MSFWs accessing health care; these include: health care costs, language, legal, and/or geographic barriers. The purpose of this study is to explore the specific health needs and health care utilization patterns of Latino seasonal farmworkers (LSFWs) in Eastern North Carolina (ENC). A mixed methods approach was used to administer a survey and to conduct two focus groups with LSFWs currently living in ENC. The survey gauged perceived health barriers and health care patterns from a sample of 150 LSFWs. After completion of the survey, focus groups were conducted, using interview guides, with an additional 28 LSFW's. The focus groups gave more information that allows for better understanding of health care utilization and self-management behaviors in this particular community. Interviewers used scripts to guide prompts in receiving effective feedback from these groups. The primary focus of the interviews was to obtain a more in depth view of how the LSFWs utilized the health care systems across ENC and what barriers they faced in obtaining quality health care. The focus groups also contributed to a better understanding of common methods the LSFW community uses when one is sick or injured. Results provided insight into additional barriers specific to LSFWs in ENC when seeking health care services. Collectively, these complications make it more difficult for the members of the community to attain proper services for their medical needs and in turn cause poor health. Using the quantitative and qualitative data from the survey and focus groups will yield more information regarding health care utilization, perceived quality of health care services, barriers to accessing health care, perceived health needs, and knowledge of available health care services among LSFWs in ENC.

UP37

Hormone Concentrations in Portal Blood in Response to a Glucose Challenge, Michaela E Morris¹, Terry E Jones², Swapnil Kachare³, Emmanuel E Zervos³, Konstantinos Spaniolas³, Walter J Pories³

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It has been well established that the foregut plays a role in secreting hormones involved in satiety and metabolism. To date the response of the foregut to a glucose challenge with respect to hormone secretion has not been studied. The portal vein drains blood from the gastrointestinal tract and is the first point of measurable hormone concentration levels.

To our knowledge, human portal vein blood has not been collected during a glucose challenge. There are ample investigations into hormone concentrations in systemic blood during a glucose challenge, but a concomitant comparison to portal vein blood has not been done. We were given portal and systemic blood samples from patients that underwent an intra-operative oral glucose tolerance test to collect portal blood pre- and post-resection of Whipple surgery. Blood samples were collected at 0, 5, 10, and 15 minutes of glucose instillation. Blood was collected from both portal vein and systemic circulation. Amylin, C-peptide, ghrelin, GIP, GLP-I, glucagon, IL-6, insulin, MCP-I, pancreatic peptide, peptide YY, and TNF-alpha were measured in portal blood and systemic circulation samples. We hypothesized that there are differences in pre and post-surgery concentrations of one or more of the analytes described above. We found that glucagon was significantly different pre-resection to post-resection in systemic circulation at two time points and pancreatic peptide was significantly different at one time point in portal blood and at each of the time points in systemic circulation. These significant differences were determined by paired t-tests. Four other analytes have strong trends towards being different with respect to pre- and post-resection; thus, further statistical analysis may show more significant differences than described above.

UP38

Stress, Burnout, and Coping Mechanisms in Health Professionals Working in Pediatric Oncology, Alix Rothbart¹, Elizabeth Jones², Annette Greer³

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Burnout syndrome is the result of multiple factors that a person experiences daily in their job or at home. Doctors and nurses are especially vulnerable to this due to the high-intensity demands of their job and the immense amount of stress they are under to save patient's lives. This syndrome takes highly devoted, ambitious, exceptional doctors and nurses and turns them into depressed, exhausted, inefficient, depersonalized, sloppy workers.

In my qualitative study, I chose to dive deeper into this topic and focus on burnout syndrome as well as the coping mechanisms in doctors and nurses in Pediatric Oncology. I interviewed several doctors and nurses and asked open-ended questions to grasp a greater understanding of what contributes to this syndrome and how doctors and nurses take action to avoid it.

UP39

The Effects of Exercise During Pregnancy On Infant

Neuromotor Skills, Gower G¹, May L², McMillan AG³

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Introduction: In 2011-2012, the prevalence of obesity in children 2-19 years was 17% in the United States, and North Carolina was ranked fifth in the nation for childhood obesity¹. Researchers have attempted to prevent obesity by intervening at various times in a child's life, with limited success². Perhaps the earliest interventions to diminish the prevalence of childhood obesity would be those occurring before birth. Moderate to vigorous aerobic exercise during pregnancy has been shown to contribute to improved cardiovascular health in the offspring³. To date research has not investigated the effects of maternal exercise on infants' neurobehavioral status. The purpose of this study is to determine the effects of maternal exercise during pregnancy on the neuromotor development of offspring. We hypothesize that exercise during pregnancy will be associated with improved neuromotor scores in infants at one and six months of age, based on standard pediatric assessment of motor skills and reflexes.

Subjects: Eighty healthy, pregnant women between 18-35 years are being recruited for this study from the Greenville, NC area. Eligible women are assigned to either the exercise (EX) group or to the control, non-exercise (CTRL) group. Those in the EX group are performing aerobic exercise 3x/week under supervision, while those in CTRL group are performing yoga 3x/week.

Data Collection: Post delivery, neurodevelopmental exams are being performed on the infants at one and six months using the Peabody Developmental Motor Scales, 2nd Edition (PDMS-2) and the Alberta Infant Motor Scales (AIMS). Variables to be analyzed to determine differences between groups will include: AIMS overall percentiles and raw score; age ratio, and PDMS-2 subtest percentiles, subtest standard scores, and overall gross motor percentile.

Subject recruitment and data collection and analysis are ongoing for this study. No results are available at this time.

UP40

Using Puppetry to Enhance Children's Awareness of the

Benefits of Exercise, Shayna Jane Meyers, East Carolina University,

Greenville, NC

It is increasingly important to encourage children to exercise due to the ever rising cases of childhood obesity, however, many children are averse to exercise education delivered using traditional classroom techniques. Puppets have been used for centuries to entertain children, and in recent decades, puppets have been used to educate children. However, little evidence exists about the efficacy of using puppets as teaching tools. Thus, the purpose of this study is to determine if there is a statistically significant difference in knowledge retention of exercise

education for children taught by traditional instruction compared to children taught through puppetry. Participants will be approximately 60 elementary school children. This study will utilize an experimental design with an experimental group (puppets) and control group (traditional instruction). The dependent variable will be knowledge of exercise retention. The independent variable will be use of puppetry in teaching. Data will be collected at three points: (a) baseline (prior to the educational session), (b) immediately following the educational session, and (c) one month follow-up.

UP41

Evaluating the Role of the School Nurse in the Reintegration of School-Age Children with Chronic Health Problems, Kali M Harrison, East Carolina University, Greenville, NC

Public schools are challenged daily with meeting the academic, physical, and developmental needs of students with special health care needs. Chronic health conditions affect 10% to 15% of American children (Duff, 2014). Successes and failures at school strongly influence the child's sense of self, academic ability, self-esteem, and peer-relationships (Shui, 2001). Extended absences can leave children feeling academically unprepared and socially isolated (Prevatt, Heffer, Lowe, 2000). Students with frequent absenteeism should return to their classrooms with program modifications and tutoring programs. It is not known to what extent the school nurse is involved in transition or reintegration programs for children with chronic health conditions. In response to this concern, the National Association of School Nurses looks to provide all children with chronic health conditions coordinated and deliberate transition planning in the school setting.

The purpose of this project is to evaluate the role of the school nurse in the reintegration of school-aged children with a chronic condition who have frequent school absences. The significance will insure a comprehensive health program for children with chronic conditions through effective reintegration programming. This project will be conducted in a rural public school in Duplin County, North Carolina. In collaboration with the school nurse I will provide direct nursing care with school-age children and conduct a record audit of children with chronic condition to compare with school absences. The project will focus on students that have missed 10 or more days of school, which follows the Duplin County School Attendance Policy, indicating a risk of failure and grade retention. I will also identify the role of the school nurse, social worker, and selected teachers working with children with special health care needs in relation to chronic health conditions and absenteeism. School-based reintegration programs will be reviewed to assess whether the children with frequent absenteeism are currently receiving these programs. The school's reintegration programs will be compared with best practices as identified in literature to identify gaps, strengths, and potential recommendations for programming in Duplin County public schools. A written report will be submitted to the school administration and the school nursing advisory board.

UP42

Examining connections between structural violence, food politics, and health inequalities in the United States: The dangers of regulatory capture, Kristin Ann Karas, East Carolina University, Greenville, NC

The primary claim of this analytic paper is that the United States government and private food corporations have committed structural violence by advocating for and enacting policies which have perpetuated inequalities in Americans' nutritional status. According to Paul Farmer, structural violence refers to "historically and economically driven processes [that] conspire to constrain individual agency." Structural violence specifically denotes systematic characteristics of existing societies that create an unfair disadvantage for certain populations. In the United States, persons of a lower socioeconomic status suffer disproportionately from both obesity and food insecurity in contrast to persons of a higher socioeconomic status. Both of these conditions are strongly associated with highly prevalent chronic diseases, which translates into a health gap between affluent and poor populations in the United States. Drawing on the concept of regulatory capture, the paper demonstrates the strong associations between the structure of relationships that food corporations negotiate with the state and health inequalities related to food policy. The paper concludes by offering recommendations for food policy that are more likely to compress nutrition-related health inequalities than existing policies that perpetuate structural violence.

UP43

Sugar Sweetened Beverage Consumption and Food Insecurity in Obese Pediatric Patients, Kimberly Paige Bostick, East Carolina University, Greenville, NC

Consumption of sugar sweetened beverages and food insecurity are both thought to contribute to the development of obesity. However, little is known about the quantity and quality of sugar-sweetened beverages consumed, the prevalence of food insecurity, or if these are related, in treatment-seeking patients. A retrospective chart review of obese children and adolescents seeking treatment at ECU's Healthy Weight Clinic was conducted. A validated beverage consumption instrument was employed to assess total calories contributed by drinks, especially sugar-sweetened drinks. Food insecurity was assessed with the USDA short form. Sugar-sweetened beverages are a significant source of excess calories in obese children. Food insecurity appears to be a risk factor for high sugar-sweetened beverage consumption and suggests that financial concerns may be linked to poor nutritional literacy.

UP44

Impact of midgut bacteria on *Aedes albopictus* vector competence for La Crosse virus, Deepa Ramaswamy, Dr. Stephanie Richards, East Carolina University, Greenville, NC

La Crosse encephalitis is a pediatric illness caused by mosquito-borne La Crosse virus (LACV) and is endemic in western North Carolina. Mosquito control is the only defense against this disease. Not all mosquitoes can transmit LACV. Hence, risk assessments must be improved to target control efforts and protect public health. Midgut bacteria may impact the ability of mosquitoes to become infected with and transmit viruses, i.e. vector competence. Therefore, our pilot study sought to characterize the extent to which mosquito midgut bacteria impacts infection and dissemination rates (proxy for transmission rate) for LACV. We developed methodology to determine the antibiotic dose necessary to suppress midgut bacteria growth using the following groups: I) no antibiotic; 2) low dose antibiotic; 3) high dose antibiotic. Antibiotics were administered to mosquitoes via sugar meal three days prior to midgut dissection and exposure to LACV. A subset of mosquito midguts were dissected and bacteria cultured for each group prior to delivering a LACV-infected blood meal. Surviving mosquitoes were collected at 14 days post-blood meal. Bodies and legs were separated and stored at -70°C until further processing (i.e. viral RNA extraction and qRT-PCR). RNA extractions and analysis of LACV presence/absence and quantification is underway. This research is part of a larger study examining the overall role of mosquito midgut bacteria in vector competence. This study will ultimately help facilitate future experiments to evaluate impacts of varying levels of midgut bacteria diversity on vector competence.

UP45

Program Evaluation of Preferred Health Information Distribution Methods for Hispanics, Cathryn A Simmons, East Carolina University, Greenville, NC

Access to language-appropriate and low literacy health information for minority populations is lacking in rural underserved areas. Duplin County is located in rural eastern North Carolina and has a total population of 60,000. The Latino population of Duplin County is 21% which is more than twice that of the state's population (United States Census Bureau, 2014). The increasing number of Hispanics in this area makes access to health information a serious issue. Societal factors that contribute to lack of access to health information include lack of health insurance and no current primary care physician as compared to their African American and White counterparts (North Carolina Department of Health and Human Services, 2010). Preferred sources of health information for the Hispanic population have been identified as healthcare providers, printed materials, and the media (Cristancho, Peters, & Garces, 2014).

A program evaluation is taking place at the Duplin County Health Department to evaluate the current methods of health information used by health department staff compared to the preferred sources of health

information by the Hispanic population. The public health interventions used in the process of this project include advocacy and potential policy development. Interviews with key informants, such as nutritionists, physicians, and public health nurses will identify barriers to receiving health information by the Hispanic population. Using the literature an assessment tool was developed to evaluate preferred sources of health information. The findings will be used to determine how to better reach this population. These findings will be provided to the Duplin County Board of Health to determine possible policy implications. The goal of this program evaluation is to assess current methods of health information distribution compared to preferred sources of health information for the Hispanic population. Objectives in this project are 1) to interview four key informants on the barriers of distributing health information and what the nurses' role is in the distribution, 2) assess the preferred health information sources of the Hispanic population, and 3) to make recommendations for improving distribution of health information to this population. A limitation of this project is the ongoing use of limited interpreter availability.

UP46

EHR and Cost: Is “Meaningful Use” Meaningfully Reducing Health Care Costs?, Katie Rebecca Pridgen, East Carolina University, Greenville, NC

The United States of America is one of the top spenders on health care per capita in the world; in 2013, we spent twice as much as France, a country known for having quality health care for its citizens (OECD, 2013). As a result, the federal government has mandated the use of EHRs in order to curb health care costs and improve health care for the citizens of the United States by increasing efficiency and interoperability among different health care delivery systems and settings. The Medicare and Medicaid EHR Incentive Programs provide financial incentives for the “meaningful use” of certified EHR technology. However, there is growing doubt whether this monetary incentive is sufficient to offset the substantial costs associated with implementing and maintaining EHR systems (Fleming, Culler, McCorkle, Becker, & Ballard, 2011). Additionally, during this same time period, the landscape of health care facilities has changed; solo practices and small group practices have been acquired by larger health care systems who are more able to purchase expensive EHR technology. This study aims to consider the benefits and drawbacks of implementing and meaningfully using the EHR as well as discuss the specific financial and nonfinancial costs of EHR implementation. This study further aims to contribute to existing research as well as suggesting further topics of related research.

UP47

Teen Pregnancy at School: The Role of the School Nurse, Jessica M Firnbaber, Dr. Martha Engelke, East Carolina University, Greenville, NC

Significance: In 2009, a total of 409,840 infants were born to teens between the ages of 15 and 19 (Centers for Disease Control and Prevention (CDC), 2011). Teen pregnancy is one of the six public health priorities of the Centers for Disease Control and Prevention as the adverse effects have an impact on everyone; the teen, the baby and the community (CDC, 2011). There is a strong correlation between teen pregnancy and school dropout rates. Utilization of school nurses can positively influence dropout rates of teens; which in turn positively influences their child. This study uses a mixed methods approach to answer the following research questions:

1. What goals do school nurses develop and attain when providing case management services to pregnant teens?
2. What are some of the challenges and opportunities that affect pregnant teens in school?
3. Are school nurses effective in helping pregnant teens develop a plan for continuing school after delivery of the baby?

Methods: Data for this study were derived from a study that examined the role of the school nurse in improving the health and academic success of students experiencing health conditions that affected their physical or psychological well-being. The study was approved by the ECU Institutional Review Board. School nurses provided case management to students with specific goals and interventions. Narrative comments were also included in the study. Analysis includes descriptive statistics related to the goals and a qualitative analysis of the narrative comments.

Results: There were 33 pregnant teens that received case management. Four girls (12%) were in 8th or 9th grade and the other students were in grades 10-12. The most common goals developed by the school nurses were: ensuring that an emergency contact was available at school; providing appropriate accommodations in the classroom; managing symptoms of pregnancy; reducing anxiety; ensuring that the teen understood the abnormal symptoms of pregnancy and verifying that the student knew how to take medications and follow a prenatal diet. The school nurse achieved these goals with 90% of the pregnant teens. The school nurses assisted 20 students (61%) to develop a plan to continue school after delivery and were successful with 16 students (80%). Qualitative analysis of the narrative comments to identify potential reasons for differences in goal attainment is ongoing and will be completed prior to the presentation.

UP48

The Efficacy of Measuring Visceral Adipose Tissue using Dual Energy x-ray Absorptiometry, John Michael Webber, Emily Coole, Gabe Dubis, Chris A. Slentz, Paul M. Coen, Charles J Tanner, East Carolina University, Greenville, NC

In June 2013 the American Medical Association declared obesity a disease. Obese individuals often contain an excess amount of visceral adipose tissue (VAT) surrounding vital organs in the abdomen. Increased VAT is directly related to increased risk of type 2 diabetes, hypertension, and insulin resistance. The gold standard for measuring VAT is computed tomography (CT). CT scans are expensive, expose patients to relatively high dose radiation, and require highly trained personnel to operate limiting them to a medical setting. Recently dual energy x-ray absorptiometry (DXA) has been used to estimate VAT. With its lower cost, less radiation exposure to the patient and availability outside medical settings, DXA may be a viable alternative assessing and monitoring risks associated with excess VAT accumulation.

The purpose of this study is to compare VAT measured using DXA to CT in morbid obese subjects following gastric bypass surgery and overweight subjects. Both groups were assessed before and after exercise interventions. It is important to understand that VAT measured using CT gives units of area in cm² while as DXA gives units of volume in cm³; therefore, results are based on mean relative change and regression analysis. The relative change in VAT following exercise intervention was significantly different ($p=0.05$) but practically similar in magnitude between CT and DXA. Regression analysis showed that the relative change in VAT measured from DXA predicted 66% of the variance in the relative change in VAT measured from CT following exercise intervention with a significant non-zero slope ($P<0.0001$). To our knowledge this is the first study to compare DXA and CT VAT measurements before and after weight loss and exercise interventions. DXA appears to be a viable replacement to CT for measuring changes in VAT associated with weight loss and exercise.

the most effective method of preventing pregnancy is to have both genders knowledgeable in contraceptive options and supportive of each other, pregnancy prevention and sexual health education has been disproportionately geared towards the female population (Starr, 2013). Adolescent males are receiving more education on the prevention of sexually transmitted infections than on pregnancy prevention, leading to gaps in their sexual health knowledge.

This project is being conducted at a middle school in rural eastern North Carolina. The middle school has a population of 524, represented by African American (44.2%), Hispanic (37.5%), and White (11.6%) students. The purpose is to evaluate the sexual health education provided to adolescent males in this rural school setting. The Healthy Youth Act of 2009 mandated comprehensive sexual health education for students in grades 7-9 in all North Carolina public schools. The project will address two public health interventions: collaboration and policy development and enforcement. A senior nursing student will collaborate with a school nurse, a family nurse practitioner, a health educator, and three physical/health education teachers to conduct this evaluation. The project objectives are to 1) obtain data on sexual health information received by adolescent males using a three-tiered algorithm, 2) interview 5-6 key informants on their role in sexual health education with males, and 3) observe sexual health education classes. In coordination with the school nurse, this data will be evaluated and interpreted to recommend best practices for sexual health education programming in a middle school. A written report will be provided to the school administration and the school-based center advisory board.

UP50

Women's Sexual and Reproductive Health Concerns, Perspectives, and Strategies, Including Perspectives about Pelvic Floor Muscles, as Perceived by Sexually Active College Women, Whitney Nicole Rodgers, East Carolina University, Greenville, NC

Women are inherently responsible for achieving and maintaining personal sexual and reproductive health and well being. Little information is available to college-aged women regarding measures they can use to enhance their sexual health and aid in the prevention of future urinary and other health problems that can be exacerbated by childbirth. Health issues such as pelvic floor muscle dysfunction can impact the well being of young women, detrimentally altering sexual and urinary function that can continue throughout their lives (Rosenbaum & Owens, 2008). The objectives of this study were to explore concerns that college aged women had regarding their sexual and reproductive health, specifically including pelvic floor muscle function. Research indicates that pelvic floor muscle strengthening increased sexual responsiveness, prepared women for future child bearing, and served as a preventative for urinary incontinence and other health concerns during the process of aging.

The researcher conducted a qualitative study using in-depth interviews that focused on college aged women's perceptions about and experiences with sexual and reproductive health promotion strategies, including the perceived role of pelvic floor muscle strengthening in health promotion. The researcher also

UP49

Evaluation of the Sexual Health Education of Teenage Males in a Middle School in Rural North Carolina, Karina Gieger Dierolf, East Carolina University, Greenville, NC

Teenage pregnancy has serious consequences for the young couple including limited education, inadequate employment opportunities, and adverse health outcomes (Alford & Houser, 2011). North Carolina is consistently among the nation's leading states in teenage pregnancy and births. Teenage pregnancy has an enormous economic impact costing North Carolina taxpayers \$325 million per year (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2015). In addition, teenage pregnancy rates are higher in rural, eastern North Carolina. In Wayne County, North Carolina the teenage pregnancy rate is 54.5/1000 compared to the state rate of 35.2/1000 (Adolescent Pregnancy Prevention Campaign of North Carolina, 2014). Although

explored the rationale and specific strategies, if any, that college-aged women employed to strengthen their pelvic muscles. This study addressed a gap in the literature by addressing the perspectives of young women who were sexually active and who had future child bearing intentions. The insights gained in this study will be beneficial to health educators who develop programs to educate college aged women about sexuality and reproductive health. Key messages for college-aged women should include the role of pelvic floor muscles in sexual response and the strategies women can institute immediately to help prevent pelvic floor dysfunction later in their lives.

UP51

Using S.T.E.A.M. To Visualize Plants In Outer Space, Brittany Nicole Brisson, East Carolina university, Greenville, NC

The purpose of this project was to create a STEAM Learning Segment for Pitt County Public Schools that incorporates a theme of Space Exploration. The NASA website was used as a resource to find a space problem that could be used in K-12 art classes. The problem that was selected for students to work with is "Growing Plants in Space". The lessons include a pre and post- test that will be administered to measure how much students learn about growing plants in space as a result of this lesson. Students will learn scientific facts that correspond with the NC Essential Standards and are adapted to their grade level. Through doing so, students will learn scientific facts about the atmosphere and soil on a selected planet in space. Students will visualize their own extraterrestrial plant and a greenhouse that will support plant life in space through the drawing process. The artwork they create will be displayed in an art exhibition that will be held in conjunction with an exhibition that is co-sponsored with Pitt County Public Schools and the Greenville Police Department, in Jenkins Fine Art Center April 19-28.

UP52

Sustainability for Student Learning, Sheng Xiong, East Carolina University Greenville, NC

Technology has been used to help improve the way humans live and the tools and equipment they use in everyday life. A few decades ago, scientists and researchers discovered that the way we make and use technology may be affecting the earth's atmosphere and environment. Because of this, scientist and researchers thought of putting in the practice of Sustainability. Sustainability is a growing practice that is beginning to be applied in future design and production and so it is important to have sustainability put into student's learning. Within the two majors of Planning and Design. ECU offers courses that either provide some involvement with sustainability or the teachings of sustainability. In these courses, students learn how to apply sustainability into the work field. Having these two majors involved in the learning of sustainability is a good start to introducing the practice

into student learning, but it should expand to other fields of study. If the learning of sustainability is open for other majors, will these students be able to improve the practice of sustainability and apply new unique ideas? To answer the question, a qualitative study will be conducted. The first step that will be taken is to see what classes provide insight on sustainability. The next step will be creating a survey. In this survey, it will help explain to students what sustainability is and gives them options to voice their opinion on whether sustainability should be broadened to other majors. Another purpose of the survey is to get an idea of what students will do with the knowledge of sustainability and how they will apply it to their field of study. With these two steps, finding the answer to the posted question will help determine whether or not sustainability is needed for majors outside of technology.

UP53

Knowledge of Sustainable/Green Friendly Designs of Croatan Building, Jordan Callinan Williams, East Carolina University, Greenville, NC

The topic that is going to be discussed is the knowledge of Sustainable/Green Friendly Features of the Croatan Building at ECU. Not everyone knows that Croatan is the first Sustainable building on East Carolina's Campus, which is also LEED certified. ECU now must obey the LEED building standards for all new construction on campus. Since LEED has different rates of certification the category Croatan falls under is Silver. Building to LEED standards will help the school save tremendous economic savings because all LEED buildings are more efficient which results in reduced operation costs. Even though LEED buildings tend to be built well with higher quality materials, reducing the need of maintenance and repairs go down. Which make the total amount in LEED-certified buildings lower than traditional buildings. There is going to be two surveys done at Croatan, to conduct knowledge about what the students/facilities members and what all they know about the sustainable aspects of Croatan. The first survey will be taken place in front of the building, asking people what they know about the sustainable aspects of Croatan. Then after getting permission, there will be signs getting put up around Croatan explaining some of the sustainable aspects. After a couple weeks of having the signs up another survey will take place. The second and last survey will still take place in front of Croatan and will consist of asking the same questions before the signs were up. Then to conclude the surveys will show the knowledge of what people know about the sustainable features before and after the signs get put up. The structure of Croatan was constructed to provide energy and water efficiency requirements that will provide energy, water, and materials for a resourceful building. Croatan has plenty of sustainable green friendly features that make it LEED-certified. Some of the features include special lighting, underground water cisterns in the courtyard and ecologically friendly landscaping that brings out good well-being to everyone walking around the perimeter. By the end of the surveying and researching of Croatan Building at ECU, everyone should have a good understanding on how the building became green friendly and LEED-certified.

UP54

College algebra redesign: improve student learning and success using a hybrid emporium course model, Andrew R Geddes, Johannes H Hattingh, April Church, East Carolina University, Greenville, NC

The purpose of this project is to describe a learning-based college algebra (Math I065) course redesign at East Carolina University. Historically, East Carolina University's College Algebra program maintained a high enrollment rate and a high fail rate (of approximately 40%). In 2012, the Department of Mathematics transitioned college algebra from a traditional lecture style format, where classes met two to three times a week for approximately three hours, to a hybrid emporium model, where classes meet once a week in conjunction with a three hour algebra lab requirement. The redesign attempted to improve student learning and ABC rates with a class that must maintain a high enrollment. This project reviews the steps taken to receive approval and funding from the university, the preliminary research for the redesign, steps taken to prepare course content and facilities, an overview of the redesigned course structure, the findings and conclusions prior to and following implementation, and a potential redesign plan for another struggling introductory mathematics course (Math I083).

UP55

The Incorporation of Reading and Writing in the Middle Grades Math Classroom: An exploration in purpose and possibilities, Mary Allison Smith, Mentor: Jamin Carson, East Carolina University, Greenville, NC

Through observations during my training in teacher education, I have noticed a general student distaste, accompanied by lower achievement, in mathematics word problems. Among closer investigation, I noticed that this phenomenon was only a portion of a more general lack in achievement involving mathematical literacy. As a student-teacher, I decided to explore solutions to this problem, in hopes of identifying a strategic way to incorporate mathematical literacy into my lessons.

By planning a full year of the math curriculum, I have identified what I feel to be an appropriate balance of activities involving mathematical literacy. The product of this exploration is a portfolio of lessons that stresses mathematical literacy throughout every standard of the curriculum. This portfolio is accompanied by a written analysis of my initial research, my proposal of four general strategies for incorporating mathematical literacy into the curriculum, and the rationale for the choices that I made in my lesson planning.

UP56

Educating the Visitors of Lake James State Park, Jacob Ryan Thomas, East Carolina University, Greenville, NC

When visiting a new area it is only natural for the visitor to be curious about the surroundings, what there is to do, and what types of environmental elements they should expect. The new construction of the Lake James State Park visitors' center will do this beautifully while incorporating a numerous amount of green building techniques. An aspect of LEED is social consciousness, which this project falls under. The program will be held right at the Visitor's center itself, in the education area of the building. It made the most sense to make the program a reasonable length to where the visitors could easily attend during their time at the visitor's center. Keeping this in mind it was decided that the program be between twenty to thirty minutes giving time for questions at the end. During the given class time the participants are taught information about what parts of the building are constructed using green and sustainable building methods. Each aspect that is green or sustainable will be dissected for the visitor giving them an interesting and informative look into the construction of this structure. There is countless areas of this building site that will follow that guidelines of LEED, these will be pointed out and described for the visitors giving them a better appreciation of the Lake James State Park. Along with just the basic and minimal characteristics of green building, this structure will show off some very cool and rare ways and usages of green building. These will be visible to the visitors through out their time at the visitor's center all around the grounds, but with their attendance to this informative program these more interesting and eye catching features will be highlighted so they can learn the real science behind their sustainable designs. The research that was conducted for this program consisted of the finding knowledge of all the green and sustainable aspects of the building and its construction. There are multiple different types of green building in the structure so a wide range of research was needed. Following the research a clear understanding of the Lake James State Park visitor's center and its make up could be concluded, this was organized in a reasonable manner and turned into a great tool for new visitors. This program will be a great way of introducing the visitors to the magnificent structure that is the Lake James State Park visitor's center and the features that make it more sustainable.

UP57

A COMPARISON OF MOTIVATION OF AN EARLY ALERT SYSTEM IN K-12 AND HIGHER EDUCATION, Kathryn Nicole Camilleri, Dr. Ricky Castles, Dr. Linda Mellish, East Carolina University, Greenville, NC

The effects of early alert systems on student motivation in K-12 and higher education are examined throughout this paper. The two early alert systems studied are Starfish™, which is designed to inform students of academic progress, connect students with appropriate campus resources, and support student success and retention and ClassDojo, which is an

immediate behavioral management system and skill tracking tool designed for use with elementary grade students. Early alert systems are used to make students aware of their current progress or standing and encourage them to alter their actions to be more successful. This paper investigated the behavioral actions of students after receiving the notifications from each early alert system. Data was gathered and studied to determine the behavior modifications, if any, after the use of the systems. Based on this study, it was determined that the same motivation strategies do not work for all students. Some students went to tutoring based on notifications from teachers, while some did not. Likewise, some students changed to more appropriate behavior based on their ClassDojo points, while others did not.

UP58

Exploring the impact of a research methods laboratory course on dietetic students self-efficacy for engaging in research and writing, James Parris, Kerri Flinchbaugh, & Virginia Caraway-Stage,
East Carolina University, Greenville, NC

Background: Dietetic educators are encouraged to prepare undergraduate students with the skills and knowledge needed to demonstrate efficacy in research methodology, interpretation of research results, and integration of research principles into evidence-based practice. The purpose of this study is to explore the influence of a research methods laboratory course on upper-level dietetic student's self-efficacy for skills important in research (RE) and research-related writing (WE).

Method: Researchers collected data from nutrition science students enrolled in a 3-credit hour writing-intensive Research Methodology (NUTR 3500) course in spring (n=30) and fall (n=23) 2014.

Approximately half (56.6%) of the students were also enrolled in a 1-credit hour laboratory (NUTR 350I). Consenting students completed a survey to assess changes in self-efficacy for RE (32 items) and WE (40 items) at pre/post. Items were assessed using a 5-point scale "Very Confident" to "Not Confident At All" (5 indicating higher self-efficacy). Descriptive statistics, Mann-Whitney U, and Wilcoxon Signed Rank were employed to analyze data.

Results: The sample was 90.6% female, with an even distribution between Juniors (49.1%) and Seniors (50.9%). Only 13.2% of students reported having research experience prior to taking the course. At pre- and post-test, no significant differences were observed between groups for RE; however, a significance difference was observed between groups at pre-test for the WE items (Lab Mdn=3.82, No Lab Mdn=4.29; U=466, p=.01). Students who took the laboratory demonstrated significant gains in RE (pre-RE Mdn=3.55, post-RE Mdn=4.17, T=444, p=.00) and WE (pre-WE Mdn=3.82, post-WE Mdn=3.95, T=310, p=.05). Students who did not enroll in the laboratory also demonstrated significant gains in RE (pre-RE Mdn=3.72, post-RE Mdn=4.06, T=205, p=.01), but not WE (pre-WE Mdn=4.29, post-WE Mdn=4.23, T=127.50, p=.97).

Conclusions: Overall, students enrolled in the laboratory course reported lower WE at pre-test; however, the difference was not observed at post-test

indicating greater gains in WE occurred in these students comparatively. The additional contact hours in the laboratory did not appear to impact gains in RE, however it may have positively impact their self-efficacy towards research-related writing skills. Steps should be taken to ensure comparable gains in WE occur in writing-intensive research courses that do not include an additional laboratory-based credit hour.

UP59

Identification and Characterization of natural modifiers of the maize microRNA pathway, Jared Charles Ingle, Beth Thompson,
East Carolina University, Greenville, NC

MicroRNAs are small non-coding RNA molecules that help in the regulation of gene expression. By studying an organism in which this regulation is disturbed, we can gain a better understanding of its normal function. The fuzzy tassel (fzt) mutant contains a mutant in dicer-like I, which encodes an enzyme required to make microRNAs. The fzt mutant, which has lower numbers of microRNAs, varies depending on the inbred background. This suggests multiple genes are responsible for regulating microRNA control. All inbreds exhibit reduction in overall size, decreased leaf number, and improper development of reproductive structures. Some phenotypes are different, however, such as when fzt mutants are introgressed into B73 (fzt [B73]) and Mo17 (fzt [Mo17]) inbred backgrounds. Because of this, I hypothesize that there are multiple genes playing a role in the expression of the fzt phenotype.

First I will define the traits that are different in (fzt [B73]) and (fzt [Mo17]) plants. Our lab has already created an F2 mapping population between (fzt [B73]) and (fzt [Mo17]) plants. I am currently working to identify families that are segregating fzt. I am also observing fzt development from this mapping population in a small-scale experiment to determine which traits show the most variation in this mapping population. Due to their easily quantifiable nature I have chosen to examine the plants for variation in leaf angle, leaf number, leaf width, internode (section of plant base defined by the beginning of a new leaf or leaves), internode number, and internode number in association to ear development.

For future work we will plant out a large mapping population and I will measure these traits between (fzt [B73]) and (fzt [Mo17]) plants. We will also collect tissue from plants and genotype them, showing the most extreme phenotypes using bulk segregate analysis. After the larger experiment I will conduct QTL analysis to look for chromosomal regions that control variation in the (fzt [B73]) and (fzt [Mo17]) plants.

UP60

Synthetic Approaches to Indicating Acid Scavengers, Madison Winslow Josey, Dr. Brian Love, East Carolina University, Greenville, NC

We are working to develop a versatile material that will be beneficial to a variety of industries. This material will have four key properties; 1) it can easily be formulated into granules, 2) it readily absorbs gaseous acids, 3) it will undergo a color change when protonated by the acids, and 4) it is easily regenerated upon washing with an aqueous base. One example for the application of this material is the protection of vacuum pumps, which are readily destroyed when gaseous acids are introduced into the machinery.

Our approach to developing such a material is to create a nitrogen-rich polymeric reagent. Specifically, we are working to create nitrosoaminopyrimidines that will easily polymerize. This compound is desired because it contains many nitrogen-rich regions that can maximize acid absorption. It also contains a nitroso group, which has been proven to change colors upon protonation. It is important for the material to be polymeric because it can then be formed into granules and is also not soluble in water.

There are two basic approaches we will explore to create this material. The first method involves creating an aminonitrosopyrimidine and then polymerizing it. The other method requires the attachment of aminonitrosopyrimidines to existing polymeric amines. The results of these experiments will be explained at the presentation of the poster.

UP61

Hormone Exposure During Pregnancy and Maternal Care, Rachel B Lockyer, Bevin Blake, Krista McCoy, East Carolina University, Greenville, NC

Stress is a major health concern in humans and is often the cause of a variety of illnesses. Events that take place early in life that increase stress and early exposure to stress hormones increase the chances of a stress-induced illness later in life. In rats, it is known that the adult stress response is mediated, in part, by early postnatal experiences. For example, adult offspring of mothers with high levels of maternal care showed reduced levels of stress (as shown through maternal care behaviors) relative to offspring of mothers with low levels of maternal care. Prenatal sex hormones are known to affect pup physiology and behavior and could affect maternal care either directly, or indirectly because maternal behavior is regulated by stimuli associated with the pups. My research tests the hypothesis that prenatal hormone exposure is associated with changes in maternal care and whether those changes can explain differences in offspring stress behavior. To test this hypothesis pregnant rats were dosed with estradiol benzoate (EB), dihydrotestosterone propionate (DHTP), or a vehicle control (cornoil) on embryonic days 15.5-17.5. On postnatal days (PND) 7 and 14, the pups and mother were recorded in their home

cage for 20 minutes. Several maternal behaviors were quantified including: mother carrying pups, licking and grooming, and arched-back nursing. Preliminary results suggest that estradiol has stronger effects on maternal care than DHTP.

UP62

Case study analysis of a ‘rain shadow’ off the Georgia coast, Nicholas C Golden, East Carolina University, Greenville, NC

Recent studies of seasonal changes in the occurrence of precipitation in the southeastern United States have revealed a distinct summertime minimum, or ‘rain shadow’ off the coast of southern Georgia and northern Florida. The purpose of this study is to examine the causes of this feature, to better understand precipitation variability in this region. The initial approach is to identify and analyze cases of precipitation systems propagating into or forming within the rain shadow. The cases were selected within the summer months, June, July, and August, for the years 2009 to 2011 off the coast of South Carolina, Georgia, and Florida. The first step was to examine animations of radar imagery to identify time periods of precipitation occurrence in the rain shadow region. The next step was to examine the mechanisms for precipitation formation from surface weather maps, and maps of sea surface temperature. Preliminary results suggest that precipitation systems propagate off the coast and weaken dramatically in the rain shadow region. The working hypothesis is the low sea surface temperatures immediately offshore reduce available energy for the precipitation systems.

UP63

Accumulated Cyclone Energy and Tropical Cyclone Tracks: An In-Depth Analysis of the Anomalously Inactive 2013 Atlantic Hurricane Season, Thomas Ashley Vaughan, East Carolina University, Greenville, NC

The purpose of this study is to explore the causes of the anomalously inactive 2013 Atlantic Hurricane Season. The 2013 season was forecast by the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center (and many other seasonal forecast centers) to be much more active in terms of tropical cyclone activity than it turned out to be. The season was characterized by tropical cyclone activity that was well below normal and produced significantly fewer named storms than expected. This study investigates the reasons behind the poor forecast by analyzing the differences in the 2013 season compared to what might be considered a “typical” season, using an average from 1995 to 2012. Specifically, this study focuses in large part on the analysis of accumulated cyclone energy (ACE), which is used by NOAA to determine how “active” an individual tropical cyclone is throughout its life cycle, and how “active” a season is as a whole. ACE is calculated by using the formula $ACE =$

$0.0001 v^2$ where v is the estimated sustained maximum wind speed measured in knots. This is calculated every six hours, typically at 0000, 0600, 1200, and 1800 UTC. For this study, the 2013 tropical cyclone tracks were mapped using ArcGIS software and the ACE for all 2013 was calculated using data collected from NOAA. The Atlantic basin was then subdivided into three regions where tropical cyclones typically form throughout the season: East Atlantic (15W-45W), Mid-Atlantic (45W-75W) and Gulf of Mexico/Immediate Eastern US Seaboard (75W - 105W). For each region, the total ACE for the 2013 season as well as the number of hurricane days was calculated. Then, the ACE values were calculated for each individual month (June-December). These values were compared with "typical" averages and analyzed. Additionally, the physical tracks of 2013 Atlantic tropical cyclones were analyzed and compared to those of a "typical" season using ArcGIS. This information quantifies the extent to which tropical cyclones in 2013 formed in anomalous locations or took anomalous paths compared to the 1995-2012 average.

This study will be a useful resource for meteorologists and climatologists to piece together the larger puzzle of why Atlantic tropical cyclone activity in 2013 was far less than what was predicted. This study comprises my Honors College Senior Thesis, under the direction of Dr. Thomas Rickenbach of East Carolina University's Department of Geography, Planning, and Environment.

UP64

The Edible World of Tomorrow, *Robert W Oliveira,
East Carolina University, Greenville, NC*

This research advocates on behalf of including edible plant species into East Carolina University's landscape and the benefits towards the ECU community. The different aspects of this are broken down into three parts. By identifying suitable locations on ECU campus based on plant species and their needs. The landscaping design and physical appeal should be a consideration to enhance the ambiance of the ECU campus. The final is benefits for the Greenville and ECU community through education, as well as, locally grown foods. The research will answer the question of how to integrate edible plants into ECU's landscape. Interviews with ECU landscape architect Kevin Barnes were conducted providing valuable information.

The use of edible plants as landscaping and food is defined by Disneyland Resort, "Tomorrowland features "Agrifuture" in its landscaping, to create supplies for a growing population" (Disney, 2014). Plant species will be rotated based on season and labeled with signs of information about them. Applying noninvasive and sustainable farming techniques is a must while, picking fragrant and appealing species like oranges and strawberries that will capture the attention of pedestrians. The future implications of this are to provide food for ECU's dining locations and to educate the students and public about their food. Excess can be sold at the Umbrella Market and Pitt County Farmers Market (Greenville, 2015). Due to over population and obesity food production techniques and strategies will need to be developed. Following this trend utilizing scenic landscaping with food producing plants is an easy conversion to ease into a global solution.

UP65

Mapping the maize mutant, indeterminate floral apexI, *Allison Marie Anthony, Richard Ullberg, George Vuong, Kristi Walters, and Beth Thompson, East Carolina University, Greenville, NC*

Maize is an important crop plant. Maize has two inflorescences, the tassel and the ear. The female inflorescence, the ear, produces kernels used for both food and the production of the alternative fuel ethanol. In the Thompson lab we are interested in identifying genes important for inflorescence development. *indeterminate floral apexI* (*ifaI*), is a recessive mutant that affects inflorescence development, causing meristems in the inflorescence to be less determinate than normal. The goal of this research is to determine what gene is mutated in *ifaI* mutants and responsible for the *ifaI* mutant phenotype. To identify the *ifaI* mutant, we are using a map based cloning approach. Previous mapping places the *ifaI* mutation on chromosome one, within 3 cM of marker umc76. We are using two mapping populations generated by crossing *ifaI* homozygotes to A632 and W22 inbreds and selfing the progeny. Using recombinant chromosomes we have narrowed down the region containing the *ifaI* mutant to an interval between markers IDP4205 and a marker located within GRMZM2G069765. In this area, there are 22 genes, 7 of which have shown a history of being expressed in the inflorescence, based on transcriptomic data. We are currently testing new markers for polymorphisms in and screening for additional plants with recombinant chromosomes in order to continue narrowing down the interval. Furthermore, we are asking if all candidate genes are expressed in the *ifaI* mutants compared to its normal siblings and, if so, we will subsequently be sequencing these genes in search of the mutation.

UP66

Cultivating the unseen majority: Soil microbial response to long-term nutrient additions, *Casey D. Eakins, Katherine Dorronsoro, Yanmei Sun, and Ariane L. Peralta, East Carolina University, Greenville, NC*

Soil microbial communities are incredibly diverse, and different mechanisms are responsible for the maintenance of microbial biodiversity. For example, microbial biodiversity can be maintained through resource availability, such as the availability of nutrients and carbon in the environment. We hypothesize that higher soil nutrient conditions will result in cultivation of more fast-growing, copiotrophic microbial species compared to slower growing, oligotrophic microbes, which are expected to be more common in nutrient-limited conditions. To test this hypothesis, in June 2014, we collected soil samples from a long-term fertilization experiment in a wetland habitat at the West Research Campus at East Carolina University. This site provided a unique opportunity to study the effects of long-term nutrient addition on soil microorganisms using culture-based techniques. We cultured soil isolates from long-term fertilization plots compared to control plots, and identified isolates using Sanger Sequencing methods. In addition, plant community composition and soil chemical factors at all plots were characterized. The identity and relationship of the microbial isolates allow us to examine the long-term impacts of fertilization on soil microbes. Together with data on plant communities and soil chemical conditions, we can build on knowledge of 'unseen' soil microbes and how resource availability influences microbial communities and functions related to nutrient cycling.

UP67

Freshwater Zooplankton of Lake James, North Carolina, *Amber N Burch, East Carolina University, Greenville, NC*

The major link between primary production and the higher trophic levels of food in aquatic ecosystems is zooplankton—microscopic animals that live in the water columns of all bodies of water. When studied, zooplankton species abundance can give indications of food web interactions, the overall aquatic health and be indicators of climate change, even in freshwater ecosystems.

In this study, zooplankton samples were taken weekly between the months of June and August in Lake James, a freshwater reservoir in the mountainous region of North Carolina. These samples were used to compare the species distribution and community composition between three different sampling sites to understand how these locations differed. Each site offers different environmental aspects that contribute to higher distribution rates with some species rather than others. Some different environmental factors that cause zooplankton to differ in their response to natural occurrences are as follows: water temperature, depth, amount of sunlight, and turbulence, all based on their species preferences. The results from this study showed that, as to be expected in a freshwater lake, Lake James shares similar zooplankton species distribution throughout;

however, each of the three sampling sites have their own unique environmental factors that play a key role in the distribution of those species. This study also gives insight to how strongly water temperature affects the distribution of zooplankton, therefore potentially showing on a small scale, how increasing water temperatures due to climate change could impact the zooplankton community in freshwater systems.

UP68

Bioinformatic exploration of Hoxa2 and HoxII in vertebrate evolution, *Kari Melissa Carr, East Carolina University, Greenville, NC*

The purpose of this project was to develop an understanding of how gene evolution shaped morphological complexity within the vertebrate lineage. Hox genes are responsible for organism development and contain the information necessary for cellular differentiation and organization. In order for organisms to develop vertebrae and other bones, the genetic code to produce skeletal tissue had to become evolutionarily available. This bioinformatic study was designed to evaluate protein sequence variations within the hoxa2 and hoxII genes from seven selected organisms: amphioxus, cyclostomata, cartilaginous fish, canine, chimpanzee, human, and an invertebrate, octopus. Hoxa2 affects formation of the neural crest and craniofacial features (Pasqualetti et al. 2000). HoxII affects development of sacral vertebrae (Swinehart 2013). Gaining a better understanding of how these genes have evolved will provide information in regards to the evolution of the vertebrate lineage. The hox gene and subsequent protein data were collected from the NCBI database. This data was then analyzed using the NCBI Basic Local Alignment Search Tool (BLAST) in order to compare the sequences to the aforementioned organisms, and was used to evaluate and determine hox gene conservation and degeneration among the selected species.

UP69

Assessing morphological variability in silversides along the Mid-Atlantic Bight, *Stephen Wayne Parker and Anthony S. Overton, Department of Biology, East Carolina University, Greenville, NC*

Inland silversides (*Menidia beryllina*) and Atlantic silversides (*Menidia menidia*) are fishes found ubiquitously in the estuaries on the east coast of the United States. These species are very similar in appearance and may share many morphological traits. The morphological variation in a species is an important component, which repeatedly has been shown to correlate with factors such as diet, habitat and predation risk in fishes. Any significant variance may be a product of genetically differentiated populations as due to reproductive isolation by distance. In this study, I analyzed

conspecific silverside populations to characterize morphological variance within and between species. My goal was to determine if geographic differences could point to significant morphological variation among silverside populations in Pamlico and Albemarle Sounds in North Carolina. I also compared these data to populations of silversides in the Chesapeake Bay, Maryland. Aquatic environments such as these have proven to exhibit spatial and temporal variability in a number of habitat parameters. I took pictures of specimens and used seventeen chosen length characteristics to determine sources of physically expressed variation between populations. I hypothesized that morphometric analysis would show significant differences in the morphological features of Inland and Atlantic silversides between the Albemarle and Pamlico Sounds as well as between the waters of North Carolina and Maryland. I also expected that the inland and Atlantic silverside populations would have significant phenotypic divergence as a result of distance between populations, with the greatest variance being exhibited between the North Carolina and Maryland populations.

UP70

PRESENTATION WITHDRAWN FOR IP PROTECTION

UP71

The role of pollinators in reproductive isolation between two subspecies of *Triodanis perfoliata*, *Christina Eileen Hoffert*, *East Carolina University, Greenville, NC*

Understanding speciation requires the study of reproductive isolation. Pollination is one of many different factors that can contribute to reproductive isolation between plant species. If two species are visited by different pollinators, there will be little potential for hybridization. We investigated pollinator visitation in two subspecies of the annual plant, *Triodanis perfoliata*. In Pitt County where the study was conducted, the subspecies grow sympatrically and crosses between them produce fertile hybrids. Pollinator behavior may contribute to the maintenance of separate

subspecies instead of the subspecies forming into one hybrid population. Three sites in Pitt County where the subspecies co-occurred were utilized. The number of visits made by insects of different groups was recorded for each subspecies in 20 hours of observation during the early weeks of summer. In addition, insect visitors were collected from each subspecies. We are currently working to identify to family each insect collected. Our study will provide insight into how pollinators contribute to reproductive isolation and speciation.

UP72

ASSESSMENT OF NICHE PARTITIONING IN CO-OCCURRING SILVERSIDES FROM THE ALBEMARLE AND PAMLICO SOUNDS OF NORTH CAROLINA, *W.*

*Robert Cope and Joseph J. Luczkovich, Department of Biology,
East Carolina University, Greenville, NC*

The niche partitioning hypothesis predicts that two species cannot compete for the same limited resources and that one species should differentiate so that the two species are fulfilling separate niches. To test this hypothesis, we collected two co-occurring silverside species, the Atlantic Menidia menidia and Inland Menidia beryllina from the Albemarle and Pamlico Sounds of North Carolina. Approximately 1100 fish were collected through multiple beach seining trips from 20 sites in the Pamlico Sound and 8 sites from the Albemarle Sound throughout the months of August to November of 2013. The fish from each site were positively identified as being Menidia menidia or Menidia beryllina and their total length was measured (to the nearest mm). Our initial length results showed that Atlantic Silversides from the Albemarle Sound had a dominant frequency of 60-69 mm while the dominant frequencies for Inland Silversides were in the 40-49 mm and 50-59 mm ranges. In contrast, the Pamlico Sound Atlantic Silversides had a dominant length frequency of 70-79 mm while Inland Silversides had a dominant frequency 50-59 mm, a range similar to that observed for this species in the Albemarle Sound. A food habit analysis of these fish is underway and we hypothesize that if niche partitioning is occurring, the food habit analysis should show that the two silverside species are consuming different prey items because of their size differences and niche role in the environment. Gut contents from 10 fish of a given species from each site in the same size range will be combined and passed through a layered sieve system for later composition identification. Statistical analysis will determine whether significant differences exist between Atlantic and Inland Silverside food habit preferences .

UP73

Call Use in a Peruvian Poison Frog, *Ranitomeya imitator*, Casey Meeks, Adam Stuckert, Kyle Summers, Department of Biology, East Carolina University, Greenville, NC

Many animals use vocalizations and other behaviors for intraspecific communication. Distinguishing between different types of vocalizations that are used within a species and determining their functions not only adds to what we know about that species' social interactions, but it also contributes to our understanding of animal communication in general. Frogs are ideal subjects for studies of communication because they commonly use vocalizations in mate attraction and mate choice. Further, some species use calling as a mechanism to maintain territories. In *Ranitomeya imitator*, a behaviorally complex species of poison frog known to be monogamous and to exhibit biparental care, males have been observed using calls in various behavioral contexts; these include territoriality, courtship, and even tadpole care. To characterize these calls and determine if and how they differ across contexts, we are recording the vocalizations and behaviors of breeding pairs of *R. imitator*. We are analyzing the dominant frequency, duration, pulse rate, call rate, and other parameters of the calls associated with each type of behavior and comparing them using R statistical software. Preliminary acoustic data show that *R. imitator* vocalizations vary in duration, call rate, and pulse rate, and this may be due to the frogs adjusting their calls for different situations.

UP74

Solubility of coumarin and vanillin in subcritical water, Albert Tran, Brandon Hill, Yu Yang, Department of Chemistry, East Carolina University, Greenville, NC

Fundamental data such as organic solubility in subcritical water are useful information in developing green separation technology. The solubility of coumarin and vanillin in water was determined at temperatures up to 200°C using a home-made solubility measuring system that consists of a high pressure pump and an oven. After the saturation, the water phase was analyzed by high performance liquid chromatography. The peak area ratios of analytes over the internal standard were graphed to produce a calibration curve. The regression equation obtained was used to find the mass of coumarin and vanillin in samples. The solubility results at different temperatures will be presented.

UP75

Characterization of MiR319-Regulated Zmtcptf29 During Inflorescence Development, Jessica Wilson, Katherine Novitzky, Beth Thompson, Department of Biology, East Carolina University, Greenville, NC

Maize inflorescences are important because they are required for reproduction and produce seeds that are consumed as food. The viability of the plant as a species is determinant upon these inflorescences, so understanding genetic pathways that function in normal inflorescence development is vital. The maize fuzzy tassel (fzt) mutant has severe inflorescence defects including indeterminate meristems, fasciation, and alterations in sex determination. The fzt phenotype is caused by a mutation in the dicer-like1 (dcl1) gene. dcl1 encodes a enzyme required for microRNA (miRNA) biogenesis. miRNAs are small, non-coding RNAs that function in RNA silencing and posttranscriptional regulation of gene expression. Some miRNAs are significantly reduced in fzt, including miR319, which targets mRNAs that encode TCP transcription factors. TCPs are plant-specific and have known roles in floral development in other plant species. Five miR319-regulated TCPs are expressed in developing tassels, however these mRNAs are not significantly upregulated in fzt tassel primordia. One possibility is that miR319-targeted TCPs are expressed in the wrong cells or at the wrong time and this misexpression contributes to the fzt phenotype. To test this hypothesis, we are examining where miR319-targeted TCPs are expressed in developing inflorescences using RNA in situ hybridization. I will characterize expression of Zmtcptf29 mRNA by designing and synthesizing RNA probes complementary to the Zmtcptf29 mRNA. I will hybridize these probes to tassel primordia from normal plants to first determine where Zmtcptf29 is expressed during normal tassel development. After I determine where Zmtcptf29 is expressed in normal tassels, I will perform RNA in situ hybridization on fzt tassels and compare the expression patterns of Zmtcptf29. If Zmtcptf29 is misexpressed in fzt I expect to see broader expression of the mRNA in tassel primordia compared to normal.

UP76

Developmental Patterns of Cleistogamy and Chasmogamy in *Triodanis perfoliata*, Elizabeth Ann Bernetski, East Carolina University, Greenville, NC

Some plants exhibit mixed mating, in which individual plants utilize both cross and self fertilization. Dimorphic cleistogamy is one form of mixed mating. In plants that display dimorphic cleistogamy, both chasmogamous (CH) and cleistogamous (CL) flowers may occur on the same individual. CH flowers are typical open flowers that are predominantly cross-fertilized. CL flowers are closed, lack petals, and are obligately self-fertilizing. Benefits of cross-fertilizing CH flowers

are that the resulting offspring may have a high level of fitness; however, they have a high energetic cost, and the flowers rely on pollinators. In CL flowers, the ability to self-fertilize may benefit plants in that reproduction can occur without the need to find a separate mating partner. However, self-fertilization generates populations that have little genetic variation and results in higher levels of inbreeding depression. Although the fitness advantages of both flower types have been hypothesized, the factors that maintain this mixed strategy have not been fully explained. *Triodanis perfoliata* is a local annual plant that exhibits dimorphic cleistogamy. Observing the patterns of CH and CL flowers in *Triodanis* may provide clarity to how a mixed mating strategy can be maintained. In a greenhouse, study individual flowers were observed to compare rates of development of the two flower types. Individual plants were observed weekly to determine the spatial and temporal development of CH and CL flowers throughout the lifespan of a plant. By sequentially numbering the nodes on the main spike of the plants, the type and developmental stage of each flower at the individual node was observed. Characterizing the spatial and temporal patterns of development of CH and CL flowers in *Triodanis* may provide insight to the adaptive value of dimorphic cleistogamy.

UP77

Effect of Endocrine-Disrupting Chemicals on Fetal Testes Morphology, *Morgan Leigh Boyd, Ciro Amato, Joshua Yang, and Krista McCoy, East Carolina University, Greenville, NC*

Studies have shown that testicular dysgenesis syndrome (TDS), which is the impairment of gonadal development and function, is increasing in prevalence. This syndrome includes cases of cryptorchidism, testicular cancer, abnormal spermatogenesis, and penile malformations like hypospadias, which is a congenital malformation where the external urethral opening is misplaced. It is hypothesized that TDS results from an irreversible developmental disorder that originates in the fetus, likely due to altered androgen signaling induced by endocrine disrupting chemicals. Fetal Leydig cells are interstitial cells within the testes that are the primary source of androgens, and therefore play an important role in the development of the genitalia. However, the link between altered fetal Leydig cell function and altered genitalia development is unclear. Androgen receptor antagonists, like vinclozolin can induce an increase in testosterone production because the binding of the chemical to the androgen receptors negates the negative feedback system that normally reduces testosterone production. However, the genitalia are not expected to respond to this increased testosterone due to vinclozolin's anti-androgenic effects. Therefore, there will be a dis-coordination between testis function and genitalia development. To begin to understand the coordination between testis form and function and genital form and function I conducted a dose response experiment with the model anti-androgen vinclozolin, which is known to induce hypospadias. I hypothesize that fetal Leydig cells will be hypertrophic (more numerous), due to the increase in testosterone production, and that germ cells,

seminiferous tubules, and Sertoli cells will show dose dependent effects. Specifically, we exposed pregnant dams ($N=3$) at embryonic days (E) 13.5-16.5 to either a corn oil control (0), 100, 125, or 150 (mg/kg). Embryos were dissected at E 18.5, testes removed, blood samples collected, and histological samples of the testes at E 18.5 were sectioned at 10 μ m and examined using ImageJ for morphological changes. Our findings will begin to characterize the link between the fetal testes function and genitalia development. Understanding how endocrine-disrupting chemicals break the linkages between these organs' systems could lead to advances in the treatment and prevention of testicular dysgenesis syndrome.

UP78

Stability of Coumarin and Vanillin in Subcritical Water, *Grayson Parker, Katie Vang, Yu Yang, Department of Chemistry, East Carolina University, Greenville, NC*

In order to develop green subcritical water chromatography methods, it is important to know the stability of analytes. In this research, the temperature effect on vanillin and coumarin stability in water is investigated. The experiments are carried out at temperatures ranging from 100-250°C with the heating time of 30-90 minutes. Once the heating is completed, the samples collected are analyzed through HPLC. The stability of coumarin and vanillin is determined by comparing the analyte quantity added before the heating with that recovered after the heating. The effects of temperature and heating time on the stability of coumarin and vanillin will be presented.

UP79

In Search of an Embryo: Using Microscopy to Assess Embryo Development and Seed Viability in *Thalictrum cooleyi*, Erika M. Dietrick, Renee Fortner, Claudia L. Jolls, East Carolina University, Greenville, NC

Thalictrum cooleyi Ahles (Cooley's meadowrue) is an endangered herbaceous species endemic to the pine savanna ecosystem. Despite being threatened by habitat loss, little is known of Cooley's meadowrue seed biology. A congener, *T. mirabile*, has underdeveloped embryos that are physiologically dormant at maturity. We asked if embryo development and ultimately seed germination of Cooley's meadowrue would be affected by different pretreatment conditions. Seeds larger than 2.5 mg in mass were exposed to one of seven treatments, including warm, cold, or room temperatures and duration of exposure (8-14 wk). We examined four seeds from each treatment with two types of microscopy to compare sizes of seeds and embryos among treatments through time, 2-14 weeks after initiation. We used a Leica EZ4 HD stereo light microscope at 25x and FEI Quanta 200 scanning electron microscopy (SEM) on low vacuum and back scattered electron mode at 20 KV and 0.45 Torr vacuum pressure. Both techniques have limitations, but SEM may better detect embryos. The embryo comprised approximately 14% of Cooley's meadowrue seed length, averaged for all treatments. Conclusions about embryo development are limited by low sample sizes; only 50% of 100 seeds appeared to have embryos, suggesting very low seed viability. We have examined 2556 seeds to date and only 620 (24%) were large enough to suggest the presence of an embryo and endosperm. Limited seed numbers and viability pose major challenges for the propagation, restoration, and conservation of this rare taxon.

UP80

Metal-Catalyzed Displacement Reaction with Retention of Configuration: A Quantum Chemical Investigation of the Mechanism, Kate E. McPherson, Andrew L. Sargent, Andrew T. Morehead, Jr., Department of Chemistry, East Carolina University, Greenville, NC

Displacement reactions in organic chemistry typically proceed with inversion of configuration, a term that reflects the opposing relative positions of the entering group A and the leaving group B with respect to the carbon atom where the reaction occurs: $A^{•••}CH_2^{•••}B$. In contrast, certain metal-catalyzed displacement reactions occur with retention of configuration, meaning that the entering group and leaving group remain on the same side: $M-CH_2^{•••}B + A \rightarrow M-CH_2^{•••}A + B$ (here M is the metal).

Our group has been using computational modeling techniques to investigate the chemical reaction pathway of a complex palladium-catalyzed decarboxylative allylation (DcA) reaction that involves retention of configuration. In this reaction, the entering group A and leaving group B are charged species. However, initial attempts to model this reaction failed, leading to a thorough search of the literature for guidance.

The search revealed the complete absence of computational studies on analogous displacement reactions, which, we presume, is due largely to the complications presented by the involvement of the charged species.

This presentation outlines our work to model a prototype metal-catalyzed displacement reaction that demonstrates retention of configuration and uses charged species. The system studied is that from the seminal work of Trost (Trost, B. M., Verhoeven, T. R., *J. Org. Chem.* 1976, 41, 3215-3216) where dimethylmalonate displaces acetate (A and B, respectively) on cyclohexene with a palladium catalyst. Critical components of the model include the use of a solvent reaction field to account for a solvent environment (albeit in an approximate way) and the explicit inclusion of molecules of solvation to more accurately account for the interactions between the charged species and the solvent.

Software programs designed for molecule building, quantum chemical energy minimization, reaction path following, and transition state identification will be applied to this study. Knowledge gained from our analysis will not only advance the field of computational modeling, but will also allow us to continue the study of the complex DcA reaction and broaden the knowledge of metal-catalyzed reaction mechanisms.

UP81

A test of phototropic response in rhizomes of *Euthamia caroliniana*, Joshua David Smith, Carol Goodwillie, East Carolina University, Greenville, NC

Contrary to popular belief, plants have the amazing ability to respond to environmental stimuli due to their complex sensory systems. The movement of plants either toward or away from a stimulus, such as light, gravity or touch, is referred to as a tropism. Phototropism, the movement toward or away from a light source, is an important sensory response that will be the focus of this study. While tropisms are well studied and described in the shoot apical meristem of a plant, starting with the work of Charles Darwin, less is known about the tropisms of rhizomes. Rhizomes are underground modified stems that are a means of vegetative reproduction, giving rise to new clonal individuals. In a preliminary observation, rhizomes of plants were seen converging to holes at the bottom of a plant pot and then growing vertically upwards. *Euthamia caroliniana* (Asteraceae) was used as the model species to test the hypothesis that the observed pattern resulted from phototropism. Two rhizome fragments were harvested from sixteen individuals of *E. caroliniana*, resulting in a sample of 32 clonal replicates. The sample was then divided into two groups; one group of clones was planted in pots covered in a translucent bag, whereas other the group of clones was planted in pots covered in an opaque bag. If we see rhizome convergence in holes of translucent bags not in the opaque bag sample, then we can conclude that convergence is a result of phototropism. This study represents the first step in determining the roles of multiple tropic responses in rhizome growth.

UP82

**Interactions between Mcm10 and Genes Located on the Third Chromosome of *Drosophila melanogaster*, Bryan J Anstead,
East Carolina University, Greenville, NC**

Mis-regulation of the Mcm10 gene has been linked with multiple forms of cancer, including many forms of breast cancer (Thu, Y. 2014). Despite this, Mcm10's function and role in cancer is not yet fully known. One way to study a gene is to see the effects when it is no longer functioning. When eukaryotic organisms are homozygous deficient in Mcm10 they are still able to function despite the complete loss of the Mcm10 protein (Christensen, T. 2003). This suggests there are other genes that interact with Mcm10 that are able to make up for its' loss, allowing the organism to continue to function despite the mutation. The hypothesis is that through studying the interactions between Mcm10 and other genes, Mcm10's role and mechanism of interactions, as well as its carcinogenic effects, will be more fully understood. Genetic screening will aid in this study of Mcm10 and its interacting genes, as well as their role in cancer. We propose an enhancer/suppressor screen of the third chromosome of *Drosophila melanogaster*, spanning roughly 7,619 genes, to determine Mcm10's mechanisms of interaction.

UP83

Underwater Vessel Noise Alters Fish Diets, T. Kyle Tobin¹, Cecilia S. Krahforst^{1,2}, Charles W. Bangley², Joseph J. Luczkovich^{1,3}

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Aquatic food webs have been disturbed by human activities. Boat noise alters animal behavior, which may cause changes to the food web. Possible behavioral changes include avoidance of an area with high vessel activity, which could lead to changes in the predator-prey relationships. Here the impact of underwater vessel noise on oyster toadfish (*Opsanus tau*) diets is explored. Oyster toadfish consume mud crabs and mud crabs in-turn consume juvenile bivalves. If vessel noise alters toadfish behavior and diet, reducing predation on crabs, there could be a cascading effect that leads to decreased oyster abundance. Oyster toadfish were collected during 2013 and 2014 from four sites in NC. Two sites had low vessel activity (<20 vessels per day) while the remaining sites had high vessel activity (>200 vessels per day). Artificial dens (36-48 half concrete blocks) were placed at each site in March to attract toadfish. In August 2013, toadfish were collected from each den and stomach contents were analyzed. In 2014, toadfish were collected once a month from May through August for diet analysis. Preliminary results from 2013 suggest that at the noisy sites, mud crabs composed 95% of the dry weight of stomach contents, but at the quiet sites, stomachs contained a variety of species, with mud crabs comprising 30% of the dry mass. These results suggest that oyster toadfish diets are altered by vessel activity, which has implications to ecosystem health. Toadfish and other soniferous fishes behave differently in locations with high vessel noise, affecting trophic relationships.

UP84

Synoptic Climatology of propagating Sea Breeze events in North Carolina, Joel D McAuliffe, East Carolina University, Greenville, NC

This study investigates what synoptic-scale factors contribute to the inland propagation of sea breeze events. To determine the cause of this phenomenon, westward propagating sea-breeze events will be compared to stationary sea-breeze events along the coast of North Carolina. Radar data animations are used to classify sea breeze events that occurred between 2009 and 2012 into propagating or stationary events. Composites of sea-level pressure, geopotential and winds from the North American Regional Reanalysis (NARR) dataset were created to identify the main contributors towards the inland movement of the sea-breeze. Preliminary results show that inland propagating sea breeze events occur when the western ridge of the North Atlantic Subtropical High (NASH) is stronger and displaced north-westward so that easterly winds prevail along the North Carolina coast.

The hypothesis that fluctuations in the North Atlantic Oscillation strongly influence the inland propagation of the sea breeze will also be investigated.

UP85

Affect of Dominance Hierarchy Formation on Neurotransmitter Gene Expression in the Crayfish *Procambarus clarkii*, Patel Aayushi, Brewer Micheal, Issa Fadi

Department of Biology, East Carolina University, East Carolina University, Greenville, NC

Sociality has long been of interest to behavioral biologists. The red swamp crayfish, *Procambarus clarkii*, is a model species for studies of sociality with many similarities to vertebrate taxa, including humans. *P. clarkii* is known to form stable social systems in which large, aggressive males establish dominance over smaller, submissive competitors for food, territory, and mates. Past studies have demonstrated that neurotransmitters, such as dopamine and serotonin, play a role in dominance and subordinance, which are established between individual crayfish over time through series of behavioral interactions. However, investigations focusing on changes in the relative expression of neurotransmitter receptor proteins have not been attempted. Herein, we utilize next-generation sequencing technologies to determine whether changes in social status result in concomitant variations in neurotransmitter receptor gene expression, which would demonstrate a plastic genetic response to an individual's position in a social hierarchy. To obtain material for genetic studies, replicates of two initially isolated adult male *P. clarkii* were crossed (i.e., placed in a common small aquarium) to allow dominant and subordinate status to be established. Behavioral interactions that indicate the degree social hierarchy were scored daily. After a four-week period, the brains of two animals from each social state (dominant, subordinate, isolated, and communal) were dissected out. Transcriptomes (i.e., libraries representing all expressed protein-coding genes and their relative abundances) were sequenced for each individual. A reference transcriptome assembly for *P. clarkii* brain tissue was assembled using all individuals, and the relative expression of each gene in each individual was assessed. Tests for differential expression of genes and isoforms between social replicates were carried out to identify transcripts showing patterns associated with social status. Our work is the first attempt to link genomics and behavior in crayfish and builds a foundation for future studies of social structure, both in crayfish and other species.

cotton plants. By analyzing the miRNAs during RKN development, the significance that the miRNAs play in the interaction between the nematodes and cotton can be better understood. Using this information, synthetic miRNAs can be developed to inhibit nematode development and/or nematode-cotton interactions. The resulting data regarding the functionality of RKN miRNAs will also be stored in a database for use universal usage.

UP87

Excessive heat may play a role in hatching success for the Eastern Bluebird, Olivia A. Green and Susan B. McRae, Department of Biology, East Carolina University, Greenville, NC

The breeding season of the Eastern Bluebird, *Sialia sialis*, extends from April through August in Eastern North Carolina. Bluebirds typically have between 1 and 3 successful broods per year, with a clutch size that ranges from 2 to 5 in this part of their range. Whereas temperatures are moderate in the early part of the nesting season, daily maximum ambient temperatures in the summer can exceed lethal levels for developing eggs. Thus, excessive temperatures may play a role in hatching failure. To investigate the effects of temperature on reproductive success, I placed Thermochron iButtons inside bluebird nest boxes to record the temperatures during the incubation and nestling periods. A control iButton was simultaneously used to measure ambient temperature at each nest site, and was fastened to the underside of the nest box. These were programmed to record temperatures simultaneously every 10 minutes. I tested the hypothesis that hatching success is related to the maximum temperature inside the nest box during the incubation period. I also predicted that experimental nests that experienced high temperatures over a prolonged period would have higher hatching failure. Coinciding with higher ambient temperatures, second nesting attempts had higher failure rates than first attempts. However, extreme temperatures alone did not explain hatching failure rates. Though some nests that experienced high temperatures had low hatching success, in others, all of the eggs hatched demonstrating they had the ability to withstand excessive prolonged heat. Other variables should be investigated, including the possibility of genetic variance allowing eggs to survive in such temperatures, or possible behavioral differences among the parenting bluebirds during incubation.

UP86

Analysis and Determination of MicroRNAs in Root-Knot Nematodes, Taylor Jefferson Gray, East Carolina University, Greenville, NC

The purpose of this project was to develop methods and techniques, using synthetic microRNAs (miRNAs), to combat root-knot nematode infestation in crops. In order to achieve this objective, micro-RNAs of the cotton root-knot nematode (RKN) *Meloidogyne incognita* (*M. incognita*) were studied and their functions determined while monitoring the development, metabolic processes, and reproduction of these parasitic roundworms, as they inhabited

Conservation of Archaeological Wood using Non-Reducing Sugars, Adeem Tabira¹, Anthony Kennedy², William Howard³

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In the conservation field there are many different thoughts on the best way to conserve waterlogged archaeological wood. The current method uses polyethylene glycol(PEG), a hydrophilic organic compound, to replace water within the wood. PEG, which is highly effective in the short term, is hygroscopic at low molecular weights and can reabsorb water leading to problems later on, such as the formation of acid within the wood and break down of PEG itself. These problems have proved especially difficult to deal with in the Vasa, a Swedish Viking ship, which is conserved with PEG. As a result conservators have been studying alternative treatments to PEG. Sugars such as sucrose have proven to be effective in the short term but can still reabsorb water, in addition to leaving crystalline deposits on the woods surface. Sucralose and trehalose, both analogs of sucrose, are non-reducing and less likely to reabsorb moisture. Our study evaluates the effective of these non-reducing sugars as a conservation practice. Tongue depressors serve as simple models for archaeological waterlogged wood. Samples are chemically degraded and then treated with varying concentrations of sugar solutions. Data collected from dimensional analysis, before and after drying, indicates that this method is effective in conserving degraded samples. Additional mechanical analysis shows that chemically degraded wood has increased elasticity and much lower mechanical strength, as is expected. Chemically degraded wood samples treated with sugars show improved mechanical properties, measured using a three point mechanical testing method. The data obtained and analysis of these samples will be further discussed. Lastly, results of preliminary studies using sugars to conserve archaeological oak samples from the pirate Blackbeard's flagship, Queen Anne's Revenge, will also be presented. These results will demonstrate that non-reducing sugars are an effective consolidant for samples such as these and may prove to be more effective than PEG for improving the long-term stability of wooden artifacts.

process, they are manually unloaded and the pallets are returned to the front of the machine to be reloaded. The problem that KCST is having is that the return conveyor for the pallets is malfunctioning, causing the pallets to fall and jam. Since the return conveyor is located under the machine, the operator must reach under the machine and manually retrieve the pallet. This causes unwanted downtime and loss of process efficiency. Currently, KCST has implemented a temporary gravity-fed return system that sits beside the machine. While this temporary solution is somewhat effective in reducing off-track errors, it is also increasing contamination issues on some PCBs due to the operator having to handle the pallets. Excess solder can stick to the pallets and collect on the operator's gloves which can then transfer to the boards during the unloading and inspection process.

After initial review of the problem, the Undaunted Pirates identified two options: 1) redesign the return mechanism that has already been put in place or 2) implement a brand new system that will fix the problem. The Undaunted Pirates approach to this issue will be to examine the current state of the mechanism and determine a defect rate. This will allow the team to test and record the amount of defective and/or contaminated circuit boards. KCST has already removed the conveyor system from the soldering wave on Line Six due to previous malfunctions. Since the mechanism has already been removed, this will provide the Undaunted Pirates with a closer look at the underlying cause of the problem and give the team more time with the machine to test different options that may define a more permanent solution to the problem. Overall, the Undaunted Pirates plan to decrease the amount of defective circuit boards, eliminate contamination caused from the unwanted handling in the temporary solution, and ultimately improve the overall efficiency of the process.

Analysis and Redesign of Solder Wave Machine Return

Mechanism, Jonathan E Hawkins, East Carolina University, Greenville, NC

The problem presented by Keihin Carolina System Technology (KCST) to the Undaunted Pirates is to redesign the return mechanism on the solder wave machines that are located on two of their production lines. These machines solder the connector onto a printed circuit board (PCB) which will eventually become an Engine Control Unit (ECU) for use in Honda vehicles. In this process, a connector is screwed down to a PCB then both are loaded into a pallet to be soldered together. Once they complete this

UP90

Global Positioning, Srilakshya Bellamkonda, East Carolina University, Greenville, NC

The Global Positioning System (GPS) is a space-based navigation system that gives location information in different types of weather at any point on Earth. GPSs have been found to be misused by invading privacy and breaking security regulations. In my research, I found that accurate latitude and longitude coordinates are displayed as decimal numbers (e.g. 23.5342°) by most GPS receivers. Many are concerned that unmanned aerial vehicles (also known as drones) can use these coordinates to attack citizens and also break down the safety of domestic space. GPSs, such as Google Earth, have enhanced the process of spying on neighbors or buying houses or monitoring security. While previous case studies have focused on the disadvantages of GPSs, few have discussed the benefits and advantages of global positioning. It is vital to perceive the benefits of GPSs to assure society that privacy and safety are protected as well as eliminate any misinterpretations about GPSs. For example, Malaysia Airlines and several other airlines have faced the dilemma of missing airplanes. With the inclusion of a GPS, we could have prevented the airplane falling and saved the passenger lives.

Different journal articles and scholarly publications were consulted to comprehend information about GPSs, such as how they function and how they have revolutionized the concept of finding directions to locations. Articles that describe cases where GPSs have been violating privacy of citizens as well as raising questions about safety were also collected. Articles that describe cases where GPSs have been benefiting the society and its citizens were also collected. I wish to present a significant hypothesis: the inclusion of a GPS on a cellular device or transportation vehicle decreases missing cases of people and vehicles.

UP91

Advancing Electrospun Scaffold Design to Improve Cell Viability, Cody Samuel Temple, East Carolina University, Greenville, NC

Introduction: Electrospun scaffolds are a common platform for tissue engineering applications. Successful transplantation of cells onto scaffolds is critical in developing 3D tissue structures. Previous research in the Cell Based Therapy & Tissue Engineering Laboratory has shown low proliferation rates and survival of human mesenchymal stem cells when added to electrospun scaffolds composed of beta-lactoglobulin (BLG), poly(ethylene oxide) (PEO) and rhodamine (RhD). Rhodamine is used to characterize scaffold structures for fluorescence microscopy and its presence has been documented inside the cell within 24 hours of cell transplantation. **Hypothesis:** Rhodamine that leaches from the scaffolds has a direct effect on stem cell viability. Can the concentration of rhodamine in the electrospun scaffolds be decreased to reduce cell toxicity without affecting the quality of live cell microscopy? **Methods:** Scaffolds composed of BLG, PEO and RhD (0.002%, 0.001%, 0.0005%,

0.0001%, and 0%) were electrospun for 48 hours. All scaffolds were cross-linked at 100° C for 96 hours and imaged with confocal microscopy. Uniform scaffold sections were placed in 24-well plates with 3.0 mL of PBS. Two control groups of PBS and PBS with rhodamine were included. The scaffolds were placed in a 37°C humidified incubator at 5% CO₂. After 24 hours, 1.5 mL was removed from each sample as well as the controls and absorbance was evaluated on a Perkin Elmer lambda 45 UV/VIS Spectrometer. Absorbance was recorded from 400 – 600 nm. Of particular interest was the absorbance at approximately 550 nm, corresponding to RhD fluorescence. This process was repeated on day 3, day 6, and day 8. **Results:** Higher absorbance values at 550 nm were recorded for scaffolds with elevated concentrations of RhD (0.002% and 0.001%) compared to scaffolds with lower RhD concentrations (0.005%, 0.001% and 0%) at day 1 and day 3. The absorbance values for the lower RhD concentrations were similar to the control PBS sample. The absorbance values of all samples increased at day 6 and 8. Fiber structure was documented in all samples with fluorescence microscopy. **Conclusion:** Rhodamine concentration in electrospun scaffolds can be reduced to levels without affecting image quality of the scaffolds. Increased absorbance values with time in solution may be related to cross contamination between wells or degradation of PEO in the scaffolds. Studies are currently being conducted to support our findings and evaluate stem cell viability.

UP92

Pore Dimension Analysis from Processing on Electrospun Laser Micro-Machined Scaffolds, Layne A Barefield, East Carolina University, Greenville, NC

Electrospinning is an extensively researched and applied method for developing conditioned scaffolds applicable to tissue engineering, regenerative medicines and clinical treatment. The scaffolds composed of composite blends of polymer and growth proteins are suitable for cell proliferation and tissue biocompatibility. This scaffold-development process offers unique opportunities to optimize and specialize scaffolds through pre- and post-processing techniques. Modifications in scaffold composition and structure can be implemented to create a simulated extracellular microenvironment to promote cell growth and integration. This study examined the effects of electrospinning time (pre-processing technique) and the application of pore insertion and heat treatment (post-processing techniques) to optimize scaffold design. The aim was to assess processing methods to create scaffold structure and pore geometry to enhance stem cell proliferation and integration. Two scaffolds were electrospun, for 29 and 49 hours, from a polymer and protein solution. Heat treatment at 110°C for 96 hours was conducted on half of each scaffold. This enabled cross-linkage by heat to increase linkage between non-woven microfibers and improve scaffold stability in aqueous solution. Pores were inserted in each scaffold sample using laser ablation with a Zeiss Laser Capture Microdissection microscope. Pore

diameter, pore depth, and scaffold thickness were measured and analyzed using three-dimensional imaging. Differences due to electrospinning time and heat treatment were evaluated. Pore diameter and scaffold thickness measurements were found to be uniform under all processing techniques. Greater variation was found in pore depth was found due to impacts of electrospin time and cross-linkage, with statistical significance correlated to heat treatment. Non-heat treated scaffolds had average depths of $28 \pm 4.5 \mu\text{m}$, while heat treated scaffolds had increased averages of $52 \pm 5 \mu\text{m}$. The 48-hour electrospun mat with heat treatment had the deepest pores along with additional benefits from cross-linkage. Future research will evaluate cell integration and proliferation on each type of post-processed scaffold.

UP93

Exploration of Modeling and Simulation in Biomedical Applications, *Alex Cain Bryan, Kiera Benson, Jayden Stewart, William Howard, Barbara Muller-Borer, East Carolina University, Greenville, NC*

Introduction: By consulting the faculty at the Brody School of Medicine, it has been determined that there is a need for a physical knee dislocation model that can simulate the geometry and the forces required to reset a dislocated knee. The purpose of this project was to create a three-dimensional model of the human knee that can be used to simulate a knee dislocation and allow in medical schools for training purposes.

Materials and Methods: This was to be achieved by designing the knee model on the computer with three-dimensional modeling software, then using a three-dimensional printer to create the model and simulate the ligaments and tendons with O-rings. The basis of the model for this project was created by Mike Jaeggli and found on the model sharing site GrabCad.com (Jaeggli 2014). The model was adjusted to include holes for dowel rods to attach the O-rings and to add extensions to the model. To simulate the ligaments and tendons with O-rings the stiffness values of the ligaments and tendons were needed. For this several articles were consulted with the most influential was "Optimization of Ligament Parameters on a Subject-Specific Computational Human Knee Model..." by Paul Wilson (Wilson 2011).

Results: As a result of this research and modeling a physical model was created using East Carolina University's Dimension 1200es printer.

Conclusion: The plan is to evaluate the completed model by having the medical school faculty test with their students.

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Wilson, Paul M. "OPTIMIZATION OF LIGAMENT PARAMETERS ON A SUBJECT-SPECIFIC COMPUTATIONAL HUMAN KNEE MODEL IN A DYNAMIC KNEE SIMULATOR USING DESIGN OF EXPERIMENTS." . University of Missouri-Kansas City, 2011. Web. 4 July 2014.

UP94

New Manufacturing Processes in the Aerospace Industry, *Samuel Axtman, East Carolina University, Greenville, NC*

The aerospace industry is a growing sector which currently does not produce a high volume of aircraft. This is likely to change, as it is predicted that 35,000 commercial planes will be needed between 2014 and 2032 [1]. Airplanes are complex and require many components making assembly complex as well. Often many of the components required are manufactured by other companies. This means the entire supply chain will have to increase component output to support the increased aircraft demand. In order to meet this demand new manufacturing processes and technology will be necessary. These new processes may be adapted from other industries or be completely new. The research conducted here will explore possible manufacturing processes that could help fulfill the demand that is predicted.

These new manufacturing processes will also be applicable to space craft production, as there are many similarities between airplanes and space craft. Travel via space is not currently a commercially viable option, but as we progress into the future it could become tangible. When the time comes for commercial spacecraft the fore mentioned streamlined supply chain will be able to handle the volume necessary to produce a commercial space fleet. It is estimated that there are at least 180 aerospace and aviation manufacturing companies in North Carolina and these companies employ more than 9,500 in the state [2].

[1] S. Walker. Supply chain opportunities in aerospace manufacturing. Manuf Eng pp. 45. 2014. Available: <http://search.proquest.com.jproxy.lib.ecu.edu/docview/1564775217?accountid=10639>.

[2] Business North Carolina, North Carolina Military Business Center, Accessed Jan. 2015.

Available: http://www.ncmbc.us/documents/FirstInFlight_final.pdf

UP95

Exploring the Use and Acceptance of Thermasteel, *Taylor Everett Cross, East Carolina University, Greenville, NC*

The Thermasteel walls are expected to revolutionize the building industry. Thermasteel is a prebuilt, deliverable, steel-framed wall. Thermasteel offers a steel-framed wall, with fire-resistance, insulation, sheathing and a vapor barrier (Thermasteel Corporation). Thermasteel is built with Modified Expanded Polystyrene Resin (EPS). This material has benefits of its own such as being lightweight, resistant to fungus and decay, it will not rot, and also it has no food value for termites (Thermasteel Corporation). The purpose of this research project is to compile in a single, user-friendly document the industry acceptance of the product, the product's ability to withstand multiple climatic conditions, examine the cost comparison compared to traditional building techniques, and finally the long term safety of the materials used. A detailed survey is to be conducted by contacting the manufacturer and the businesses who have already utilized the product, along with others considering using the product in the future. The final product will include a summary document that would benefit other companies who are considering the use of this product.

UP96

A Comparison of Blast Membrane Effects on Achieved Overpressure in an Advanced Blast Simulator, *Melissa Ann Hall, Teresa J. Ryan, Department of Engineering, East Carolina University, Greenville, NC*

Blast injuries are a critical threat facing our troops serving overseas. Blast injuries may range from primary severe injury, such as eardrum, lung and organ rupture to the less well-understood and sometimes subtle mild traumatic brain injury. Studying and understanding the effects of blast waves can aid in the development of better medical treatment as well as improving protection against these effects. Work in this area includes evaluation of the effectiveness of personal protective equipment. Testing different scenarios using the protective equipment currently provided to troops overseas will determine the extent that proper use or misuse affects the intended blast protection. Another application of this work is an inexpensive, personnel-mounted blast sensor to monitor for troop exposure to potentially injurious blast overpressures. ECU's Laboratory for Simulated Blast Injury and High Explosive Research has an advanced blast simulator. This system creates blast waves by pressurizing a driver chamber that is sealed with a thin flexible membrane. The rupture of the membrane creates the blast wave that propagates down the test chamber. Consistent and predictable blast pressure is key for successful study of any blast-related phenomena. This work proposes to examine aspects of the membrane (thickness, material, and layer composition) to determine the effects on the resulting blast overpressures. Overpressure is assumed linear with membrane thickness and testing resolution is limited to available membrane thicknesses. In order to test for specific blast

overpressures, intermediate membrane thicknesses are a testing advantage. The currently available membrane thicknesses are 0.005, 0.010, 0.015, and 0.20 inches. For any given desired thickness we will compare the performance of a single layer membrane to the performance of a composite membrane made of multiple, thinner layers with the same overall thickness. Specifically we will compare means and standard deviations of the resulting overpressures.

UP97

Characterization of the Early Gene at 23 as an Ecdysone Ovarian Signaling Target, *Study Radhika J. Kothadia, Undergraduate, East Carolina University, Elizabeth T. Ables, Department of Biology, East Carolina University, Greenville, NC*

Drosophila melanogaster (fruit fly) females undergo oogenesis to create oocytes from undifferentiated stem cells in the ovary. Ecdysone, among many other steroid hormones, has a known role in facilitating oogenesis. After ecdysone binds to an ecdysone receptor (EcR), EcR activates transcription of many genes, such as E74, E75, and E78. These early genes code for proteins that are essential to *Drosophila* tissue repair, development, and reproduction. One of the early genes, E23, is thought to be a target of ecdysone signaling, but little is known about its function. Because E23 is expressed in multiple cell types, including ovarian cells, I hypothesize that E23 plays a role in *Drosophila* viability and reproduction. To determine the role of E23 in *Drosophila melanogaster* viability, flies harboring transposable element insertions in the E23 locus were analyzed for potential mutant phenotypes. My initial experiments using these lines suggest that E23 is not needed for viability or reproduction; however, I am currently testing whether E23 affects oogenesis in more subtle ways, using high-resolution confocal microscopy. I am also developing new tools that may provide more complete knock-down of E23 function. Although my preliminary data currently suggests that E23 is not needed for the survival of *Drosophila* and its offspring, it may have other important functions within the fruit fly.

UP98

Intensity of amyloid beta (A) peptides and the exposure of their hydrophobic residues in forming amyloid plaques., *Sarah Sipe, Dr. Anne Spuches, East Carolina University, Greenville, NC*

Alzheimer's Disease (AD) is a progressive, neurodegenerative disease that affects 35 million people worldwide and is the 6th leading cause of death in the United States. AD is characterized by neurofibrillary tangles and amyloid plaques in the brain. The plaques are formed when amyloid beta (A) peptides aggregate at their hydrophobic residues. Elevated concentrations of essential metals, copper, iron, and

zinc, have been detected in the plaques and research indicates that the presence of metals speed up the formation of the plaques. Previous binding studies have determined that metal binding occurs within the first 16 amino acids of the A peptide, which can be either 40 or 42 amino acids long. The identical rat A peptide differs by only 3 amino acid point substitutions and are immune to aggregation. Based on previous thermodynamic binding studies, the exposure of the peptides' hydrophobic residues when bound to copper (II) are hypothesized to be more exposed in the human peptide than the rat. To test this hypothesis, rat and human A28 peptides are probed with hydrophobic fluorophores I,8-ANS and bis-ANS. Increased fluorescence is expected of human A28 if the hydrophobic residues of the peptide-copper complexes are indeed more exposed.

UP99

The Role of miRNAs in Early and Late-diseases in Response to Post-embryonic Nicotine Exposure in *C. elegans*, Krishna

Kiran Patel, Robyn Alston and Sana Bharde, East Carolina University, Greenville, NC

MicroRNAs fine tune the expression of target genes directly or indirectly to regulate biological phenomena and maintain homeostasis. Therefore, they have an expression profile that reflects normal versus disrupted states. Our pilot study showed that nicotine altered the systematic miRNA profile (17%) in *C. elegans* larvae. Pathway enrichment and prediction analyses for most affected miRNAs (6%) were concerned with development and growth, reproduction and transcriptional regulation (Taki et al. 2014). Complimentarily, our phenotypic preliminary data showed that post-embryonic nicotine exposure delayed larval development and increased adult germ cell apoptosis in *C. elegans*. This suggests that some miRNAs i) mediate nicotine's effect on development and apoptosis phenotypes in both larvae and adults, ii) work in concert with signaling hubs to affect those phenotypes and iii) are promising targets for diagnosis and therapy of nicotine-associated complications related to the heart and proliferating cells. Here, we plan to investigate the molecular mechanism for nicotine-induced adolescent- as well as adult-onset phenotypes. For that, we focus on three phenotypes: larval pharyngeal pumping, adult germ line apoptosis, and survival. Our data suggests that post-embryonic nicotine exposure inhibited pharyngeal pumping, and increased germ cell apoptosis in WT worms and this pattern was altered in miRNA and target mutant strains. Due to the conservation of those signaling pathways, our results provide insights for effective miRNA-based treatment strategies for nicotine-related disorders in early and late stages.

UP100

Determination of GdN@C(OH) interaction with Zn²⁺ via fluorescence measurements, Andrew F. Reid and A. A. Rodriguez, Department of Chemistry, East Carolina University, Greenville, NC

Today MRI imaging techniques are capable of discerning between abnormal and normal complex tissues by providing contrasting images of these tissues. One drawback of using MRI imaging is its low sensitivity. However, this sensitivity can be greatly enhanced by introducing a contrasting agent who can provide a new pathway for water molecules to relax significantly faster and hence generate the desired "contrast" between healthy and unhealthy tissues. We report the first ever recorded fluorescence emission spectrum of GdN@C(OH) interacting with Zn²⁺. Our emission data indicates that the Zn²⁺-GdN@C(OH) interactions lead to fluorescence enhancement via a static quenching mechanism. The binding constant, K_b, on the other hand, was found to be of the same magnitude as interactions between human serum albumin and small organic acid but quite different, several orders of magnitude smaller, than protein nanoparticle complexes. Interestingly, the binding number, n, was found to be approximately 1.0. The data also indicated an extremely fast rate constant on the order of 10¹² L/mol*s which is outside of the diffusion-control regime. These results are presented within this presentation.



UP101

Effect of Treadmill Verses Overground Running on Knee Joint Loads

Johnson Holly T¹, Halsey Lisa², Hayek Andrew², Willson John D², Willy Richard W.², ¹College of Health and Human Performance, ²Dept of Physical Therapy, College of Allied Health Sciences, East Carolina University, Greenville, NC

Introduction: The modulation of knee joint loads during running is likely key to reducing risk of knee osteoarthritis (OA), particularly in at-risk populations. Overground (OG) and treadmill (TM) running are often both used in rehabilitation after knee injury. However, little is known regarding potential differences in knee joint loading between OG and TM. Peak and cumulative articular cartilage loads are both key components of the OA disease process. The peak knee extensor moment, a component of knee joint loading, has been reported to be greater during OG running. However, step length has been reported to be shorter during TM running. Thus, TM running requires more steps to run a given distance, potentially resulting in greater cumulative knee joint loads. To date, it is unknown if OG or TM running has greater peak and cumulative knee joint loads. We sought to determine which mode of running is best to these loads in healthy runners.

Hypothesis: We hypothesized that individuals would demonstrate higher peak knee loads during OG running but greater cumulative knee joint loads running on a TM.

Methods: 3D running mechanics were sampled from 18 healthy individuals (BMI:22.1 kg/m² ±2.7, Running Volume: 36.7 km/week±26.5) during TM and OG running. A custom musculoskeletal model estimated sagittal plane knee contact forces. Peak knee contact force (Pk TFZ) was calculated. Next, the time integral of the sagittal plane knee contact forces per stance phase (Impulse TFZ) and step length were used to estimate the cumulative load per kilometer of running (cumulative TFZ per km).

Results: Interestingly, Pk TFZ was not different between the conditions ($p=0.52$, OG: 8.6 body weights (BW) ±1.4, TM: 8.5 BW ±1.3) nor was Impulse TFZ ($p=0.99$, OG: 1.2 BW ±0.15, TM: 1.2 BW ±0.2). Consistent with the literature, step length was shorter during TM running ($p<0.0001$, OG: 1.1 m ±0.1, TM: 1.03 m ±0.1). Therefore, cumulative TFZ per km was greater during treadmill running ($p=0.008$, OG: 1060.8 BW ±127.5, TM: 1130.1 BW ±168.4)

Conclusion: Based on these data, OG running may be preferred to minimize cumulative knee joint loads. These findings may be important for individuals who are at high risk for tibiofemoral OA.

UP102

Validating the Patient Reported Outcomes Measurement Information System for Pain, William T Hayden, East Carolina University, Greenville, NC

Pain is a therapeutic challenge as well as a public health problem that affects over 116 million American adults; reduces quality of life; and is estimated to cost up to \$635 billion annually. There is a growing

recognition that health care outcomes will be improved by matching proven effective treatments with knowledge of patients' unique characteristics to optimize efficacy and safety. This project aims to assess the validity of the Patient Reported Outcomes Measurement Information System (PROMIS) for pain. PROMIS is a computerized system measuring patient-reported outcomes across a wide range of chronic conditions but has not yet been studied for pain. In this pilot study, PROMIS questionnaires will be given to healthy volunteers and responses will be compared to those of patients with acute pain following the removal of wisdom teeth. We hypothesize that self-reported responses to PROMIS domains of physical, mental, and social health in patients with acute pain will differ from those of healthy volunteers. We predict that we can categorize patients into sub-groups based off PROMIS domains hypothesized to be related to acute pain. PROMIS item banks to be studied include pain intensity, pain interference, fatigue, anxiety, depression, the ability to participate in social roles and activities, physical function, and sleep disturbance. Before surgery, patients will answer questionnaires related to pain. After the removal of wisdom teeth the questionnaires will be repeated. Patients will be instructed to return to the study site 48-hours after surgery to repeat the questionnaires. In a pre and post design, patient responses will be compared to those of healthy volunteers. Validation of PROMIS for acute pain will allow for a more comprehensive phenotyping in future acute pain studies known as deep phenotyping. Combined with genomic data and quantitative sensory testing, PROMIS can help eliminate observer-based perceptions of patients' pain and allow for more specific drug therapy.

UP103

Successful Elimination of Viral Pathogen from Murine Breast Tumor Cells by Passaging Tumors in Athymic Nude Rats, Matthew Britt, Keith Pittman¹, Karen Oppelt², Nasreen Vohra¹, and Kathryn Verbanac¹, ¹Department of Surgery; ²Department of Comparative Medicine, The Brody School of Medicine, East Carolina University, Greenville, NC

The majority of breast cancer deaths result from tumor metastases. In order to better understand the metastatic process, our laboratory is studying the pro-metastatic niche or pro-tumor microenvironment at metastatic sites, focusing on triple negative (TN) breast cancer in mouse models. The TN tumor phenotype refers to the absence of estrogen and progesterone receptors and decreased HER2 receptors, which are often targeted for therapy. The T11 TN mouse tumor was obtained from two sources (Baylor College of Medicine and UNC-CH). When tested for mouse pathogens by polymerase chain reaction (PCR), both tumors were found to be infected with murine Lactate Dehydrogenase Elevating Virus (LDEV). LDEV specifically infects mouse macrophages, where it replicates and causes changes in tumor behavior and immune system responses. The purpose of this project was to isolate T11 tumors that were free of LDEV in order to generate a valid tumor model for studies of breast cancer metastasis. Passaging virally-infected mouse tumors in athymic nude rats has been reported to produce pathogen-free tumors; mouse macrophages will not survive in a nude rat, and murine-specific

viruses will not infect or replicate within rat macrophages. Each tumor was implanted subcutaneously into different 6-14 week-old female RNU athymic nude rats and allowed to grow for 13-26 days or until they reached 4 cm in diameter. Tumors were then excised and tumor tissue (10mm^3) was serially passaged into subsequent naïve rats. After 3 serial *in vivo* passages, each tumor line was found to be free of LDEV when reanalyzed for single strand LDEV RNA by PCR (Charles River Laboratories). Results from tumors after 1 and 2 serial passages are pending. Plasma LDH levels (LDH -Fuji Dri-Chem) in naïve rats averaged $270 \pm 100 \text{ U/ml}$ ($n=12$). Plasma LDH levels increased over time after tumor implantation to an average of $887 \pm 545 \text{ U/ml}$ ($n=9$) (7-26 days; $p<0.01$ vs. naïve) but did not correlate with LDEV infection. This is likely because expression of LDH, a metabolic biomarker of anaerobic glycolysis, is reported to be elevated in TN breast tumors. To conclude, passaging infected TII tumors in athymic nude rats was successful in eliminating LDEV. This valuable tumor model will enable *in vivo* studies of the pro-metastatic niche in TN breast cancer that are not confounded by the effects of a pathogen on tumor behavior, immune responses or tissue microenvironments.

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UP104

Prevention of Synaptic Loss in Alzheimer's Triple-transgenic Mouse Model with miRNA-43I, Sean Patrick Ross, Elena Pak, and Alexander Murashov, East Carolina University, Greenville, NC

Alzheimer's Disease (AD) is currently the most prevalent form of dementia. With synaptic loss as the primary characteristic, AD not only results in memory loss, but in vital function degradation and eventually fatality as well. Ongoing research continues to accumulate evidence of excessive accrual of amyloid-(A) peptides in brain tissue as the probable source. Recent research in mouse models has indicated that the buildup of A_β initiates the increased expression of Dickkopf-I (DKKI) protein, an antagonist of Wnt signaling pathway. The intent of this study was to test the application of microRNA-43I(miR-43I) as a means of preventing further synaptic loss by targeting KremenI, the DKKI receptor. The KremenI receptor site targeting miR-43I, as well as DKKI, and ADDL (an amyloid- derived diffusive ligand) were administered to cortico-hippocampal cultures isolated from 3x transgenic AD (3xTg) and wild type (WT) mice (control) of varying ages (3-6 months). Each cortico-hippocampal culture that had (and had not) been transfected with miR-43I after 48 hours was then incubated with antibodies specific to axonal pre- and postsynaptic proteins for immunofluorescent imaging. 15-20 images were taken of independent neurons in each coverslip. The number of pre- and postsynaptic puncta as well as length of axons and number of branches was then recorded and compared. Exposure to DKKI and ADDL reduced the number of pre- and postsynaptic puncta in 3x Tg as well as in WT cultures of the 3 month old mice .Treatment with miR-43I showed significant rescue of the synaptic sites (SynapsinI:control- 1.8 ± 0.27 , DKKI- 1.33 ± 0.23 , DKKI+miR43I- 2.53 ± 0.25 puncta/ $100\mu\text{m}$, $p<0.005$. PSD95: control- 1.43 ± 0.041 , DKKI-

0.78 ± 0.11 , DKKI+miR43I- 1.78 ± 0.28 , puncta/ $100\mu\text{m}$, $p<0.01$). Similar results were observed on 6 month old mice.. Analysis of the length of the axons and number of branches showed that application of DKKI or ADDL significantly reduced the length of the axons and number of the branches. Treatment with miR-43I reversed the effect for the axonal length but did not affect the amount of branches (Axon's length: control- $99.97 \pm 4.97\mu\text{m}$, ADDL- $63.97 \pm 5.64\mu\text{m}$, ADDL+miR-43I- $97.87 \pm 5.34\mu\text{m}$, $p<0.0005$). These findings demonstrate that miR-43I can protect synapses and axons from A-toxicity in AD mice model.

UP105

Characterizing the Anti-Cancer Activity of a Novel J-Series Prostamide, Rene Escobedo, Daniel A. Ladin, Eman Soliman, Rukiyah Van Dross, East Carolina University, Greenville, NC

Cancer is the second leading cause of death in the United States. Many of the chemotherapeutic agents and surgical procedures that eliminate cancer cells can cause severe adverse effects because they also cause damage to normal cells. Therefore, improved chemotherapeutic treatments are needed to reduce cancer mortality. For this reason, researchers have begun to study the use of cannabinoids, endocannabinoids, and their metabolites as anti-cancer agents. One such example is the endogenous cannabinoid neurotransmitter, arachidonoyl ethanolamide (AEA), which induces tumor cell death. AEA is metabolized by cyclooxygenase 2 (COX-2) to prostaglandin-ethanolamides. COX-2 is an enzyme that is overexpressed in many cancers including colon and non-melanoma skin cancer. Our group determined that the primary metabolite of AEA metabolism by COX-2 was the novel prostaglandin ethanolamide, 15-deoxy- $\Delta^{12,13}\text{PGJ}_2$ -ethanolamide (15d-PGJ-EA). The current study seeks to determine if 15d-PGJ-EA is a potent agent that selectively induces death in tumor cells. Understanding the effects and underlying mechanisms of 15d-PGJ-EA is vital to effectively develop new and safe treatments for cancer.

The cytotoxicity of 15d-PGJ-EA was evaluated in tumorigenic JWF-2 keratinocytes and non-tumorigenic HaCaT keratinocytes by conducting MTS assays. At $5\mu\text{M}$ 15d-PGJ-EA, there was a 4.1-fold difference while at $10\mu\text{M}$ there was a 217-fold difference in JWF-2 cell survival compared with HaCaT cell survival, respectively. To further examine the hypothesis that 15d-PGJ-EA is a potent inducer of cell death, various tumorigenic colon and melanoma cell lines were treated with 15d-PGJ-EA. A dose-dependent decrease in cell viability was observed in all tumor cell types. Finally, we compared the cytotoxicity of 15d-PGJ-EA to the anticancer agents, oxaliplatin and irinotecan in HT-29 colon cancer and BI6F10 melanoma cells. Oxaliplatin and irinotecan are used clinically to treat colorectal cancer, while oxaliplatin is used to treat melanoma. The results indicate that 15d-PGJ-EA is a more potent inducer of colon cancer and melanoma cell death than oxaliplatin and irinotecan. Collectively, these findings suggest that 15d-PGJ-EA is a potent agent that selectively elicits cell death in tumor cells. Hence, 15d-PGJ-EA may be an effective agent for the elimination of cancers of different tissue types.

UP106

Vaccinia OIL Protein Characterization, *Allen R Scurlock, Anastasia Weeks, Gwendolyn Jones, Dr. Rachel Roper, East Carolina University, Greenville, NC*

Smallpox (*Variola*) has been eradicated since 1980, however poxviruses are still important to study because smallpox continues to be a major bioterrorism threat and monkeypox outbreaks continue to persist in Africa. While we do have a vaccine for smallpox that uses the Vaccinia platform, it is not available to a wide range of individuals including: pregnant women, the immunocompromised, and eczema patients because these populations can have severe reactions to the vaccine which could lead to death. Our lab has shown that OIL is a highly conserved poxvirus gene that is a virulence factor. In order to study the gene, we created two OIL knockout mutant viruses (IAI and 3A2) and compared them to the wild type Western Reserve (WR). We want to evaluate the size of the protein; which was estimated by a bioinformatics program to be around 78 kDa. In order to do so, we had an anti-OIL antibody made and investigated OIL production in two cell lines, BSC-I (Monkey Kidney) and HeLa (Human), using western blotting. Using this technique we were able to visualize the OIL protein band produced in both cell lines, however we visualized a stronger band from the HeLa cells. We also concluded the actual size to be around 107 kDa, which may be due to glycosylation of the protein. Preliminary data suggests that OIL also has a function in migration of infected cells, which could affect spread of the virus in an animal. Future experiments will focus on migration as well as localization of the protein in the cell. The outcome of these experiments is to further understand the poxvirus genome and to deepen the understanding of poxvirus pathogenesis, as well as to possibly provide safer vaccines by removing OIL.

UP107

The effect of exercise timing on the blood glucose response to a meal in children, *Madelon A Wygand, Human Performance Laboratory, Department of Kinesiology, East Carolina University, Greenville, NC*

With the recent rise in childhood obesity, much research has focused on exercise and diet as ways to improve health and decrease risk of disease. Not as much research, however, has investigated how to most effectively combine exercise and meals to promote healthy lifestyles for children. It is important for research to be conducted to determine the best ways to improve the health of children and decrease the rates of childhood obesity and diabetes. The aim of the current study was to investigate whether or not the timing of exercise affects a child's blood glucose response to a meal. We investigated the relationship between exercise and meal time in nine children between the ages of 7 and 11 years. In order to be eligible for the study, the children were required to submit a health history form, a verbal assent and a parent's signed informed consent, and must have been

healthy enough to exercise. To investigate the blood glucose response to a meal, the children underwent four days of testing at the FITT Building at ECU. For two of the trials, the children arrived at the FITT building and immediately underwent a measure of their blood glucose concentration. The children then ate a Lunchable provided by the study sponsor, followed by participation in a 60-minute exercise session comprised of active games and moderate exercise. Blood glucose measurements were recorded every 30 minutes that the children were at the FITT building for a total of 90 minutes. For the other two trials, the children also had their blood glucose concentration measured upon arrival. These children then participated in a 60-minute exercise session comprised of active games and moderate exercise, consumed their Lunchable following the exercise, and then rested for 30 minutes. Their blood glucose concentration were also measured throughout the time they were at the FITT building for a total of 120 minutes.

It was concluded that, in the children tested, the timing of exercise did not significantly impact the resulting blood glucose concentration after a meal. Future research can determine more specifically the ideal exercise time with respect to meals to better control blood glucose concentrations in children and investigate how the results found in this study compare to obese and diabetic children. This new information could be used to make significant reductions in the increasing rates of childhood obesity and diabetes that exist in the United States.

UP108

Effect of Foot Strike on Patellofemoral and Tibiofemoral Joint Contact Forces, *Huf Mikayla D¹, Willson John D²*

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Introduction: Over the past forty years, running as a form of exercise and recreation has grown rapidly. High patellofemoral joint (PFJ) and tibiofemoral joint (TFJ) contact forces may contribute to injury at these joints. A forefoot strike pattern, as opposed to a more typical rearfoot strike pattern, has been proposed as a running modification to decrease PFJ and TFJ contact force. The purpose of this study was to test for reduced PFJ and TFJ contact force while running with a forefoot strike pattern.

Methods: Twenty runners participated in this study (22.1 years, 174 cm, 68.4 kg, 10 female and 10 male). Three-dimensional lower extremity kinematics (240 Hz) and ground reaction forces (2400 Hz) were recorded as participants ran at their preferred speed using their preferred strike pattern (typically a rearfoot strike) followed by their alternate foot strike pattern (typically a forefoot strike). Hip, knee, and ankle sagittal plane angles and net internal joint moments served as inputs for a biomechanical model to derive PFJ force and TFJ force during each running condition. Total PFJ force and TFJ force per step were calculated as the area under the PFJ force and TFJ force curves. Differences between peak PFJ and TFJ force and impulse per step were examined for significance using

paired t-tests ($=.05$). Effect sizes and percent differences between conditions were calculated to illustrate the relevance of the differences observed.

Results: Runners experienced a 10% lower peak PFJ force ($P = .001$, ES = .49) and a 12% reduction in PFJ impulse per step ($P = .002$, ES = .47) while running with a forefoot strike pattern. However, running with a forefoot strike pattern did not reduce peak TFJ force ($P = .21$, ES = .17) or TFJ impulse per step ($P = .65$, ES = .07).

Conclusions: Utilizing a forefoot strike was found to decrease loads experienced at the PFJ. Loads experienced at the TFJ did not increase or decrease while running with a forefoot strike pattern. Habitual rearfoot strike runners with patellofemoral joint pain may benefit from utilizing a forefoot strike in order to decrease joint contact forces.

UP109

Regulation of Angiotensin II induced TGF-I mediated Collagen Expression via Snail and Slug in Cardiac

Myofibroblasts., Breyonnie Edwards², Robin Gawdi¹, Paul Ferrell¹, Dr. Laxmansa C. Katwa¹

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Snail and Slug are transcription factors that bind to E-box sequences to regulate the promoter activity of target genes. Snail family proteins play a role in wound healing, endothelium to mesenchymal transition (differentiation of adherent endothelial cells to migratory mesenchymal cells such as fibroblast), and cell migration. Snails are required for any developmental processes in developing cardiac tissue. We hypothesized that snail and slug play a role in Angiotensin II (Ang II) mediated Transforming Growth Factor-I (TGF-I) induced collagen synthesis in cardiac myofibroblasts, the primary source of collagen. The experiment was designed to determine the effects of Ang II and TGF-I on snail and slug gene expression in cardiac myofibroblasts as well as if snail and slug regulate Collagen I expression via snail and slug siRNA transfections. Myofibroblasts were isolated from rat heart 28 day post-Myocardial Infarction. Cells were treated with Ang II (10-7 M) with and without Dup753 (Losartan) (10-5M): an Angiotensin II Type I Receptor (ATIR) blocker, TGF-I (10 ng/mL) with and without ZK (10-6M, TGF-I blocker) and ZK for 12-16 hours for protein extraction and RNA isolation. The western blot and qRT-PCR data demonstrates that Ang II stimulated type I collagen expression is via ATIR. Ang II increases the Slug gene expression and is negated by ATIR antagonism. TGF-I stimulates Snail expression and is negated by TGF-I blocker, ZK. Snail and Slug siRNA transfection significantly decreased type I collagens expression (* $p < 0.05$). This demonstrates that Snail and Slug participate in Ang II mediated, TGF-I dependent collagen synthesis in cardiac myofibroblasts.

UP110

Neurobehavioral Impairments in a Triple-Transgenic Mouse Model of Alzheimer's Disease, JoColl Burgess^{1,2}, Lidia Ortega^{1,2}, Iola Conchar¹, and Tuan D. Tran, PhD^{1,2}

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BACKGROUND and SIGNIFICANCE: Alzheimer's disease (AD) is characterized by severe cognitive dysfunctions, including memory loss and difficulty with spatial awareness, severely hindering everyday performance for those it affects. AD is the primary cause of dementia and contributes to 60-70% of cases (Barker et al., 2002). About 5.3 million Americans (roughly 12.5%) over 65 are afflicted with AD (Holtzman et al., 2011). Although AD generally plagues the elderly, brain degeneration and cognitive dysfunction can occur 10-20 years before dementia onset. An alarming number of individuals are affected by AD worldwide (~30 million) and by extension, the burden of this disease is encumbered by patients' families, caregivers, and society at large, prompting tremendous efforts by researchers and clinicians to translate their findings into developing efficacious therapies. AD is thought to be a disorder involving multiple genetic abnormalities and cellular pathways (Holtzman et al., 2011), and current studies using genetic methods may lead to new insights into its pathogenesis. Indeed, present studies using triple-transgenic (3xTg-AD) mice expressing APP-Swe, PSEN-M146V and tauP301L mutations are helping to this end. In this study, we examined whether 3xTg-AD mice exhibit neurobehavioral deficits across the lifespan, thus modeling disease progression in humans.

DESIGN: At 6, 9, and 12-months of age C57BL/6J and 3xTg-AD mice were exposed to 10 days of water escape training using the place version of the Morris maze. Afterwards, they were trained to the "trace" version of eyeblink classical conditioning (ECC). Learning in both tasks is mediated by an intact hippocampus, a primary target of AD pathology. Because the 3xTg-AD mice bear all three hallmark features of AD seen in humans, we hypothesized that they will exhibit impairments in acquiring both tasks successfully, particularly as they age. After ECC was completed, their hippocampi were examined for cell loss in CA1, a key population that mediates learning and memory processes.

RESULTS and CONCLUSIONS: The data gathered from these assessments may provide greater insight on the differential brain deficits and cognitive impairments resulting from AD, thus opening possibilities for developing experimental therapeutics that minimize its pathogenesis.

UP111

The Effects of Overexpression and Knock-Down of SH3PXYI on Escort Cells, *Jasmine Gabriel Hughes., East Carolina University, Greenville, NC*

Changes in cell morphology can have a dramatic impact on cell function. One feature of many migrating cells, including invasive cancer cells, is the formation of thin actin-based membrane protrusions called filopodia; however, the molecular mechanisms controlling membrane curvature during filopodia formation have not been fully described. Sorting Nexin-9 (SH3PXYI in *Drosophila*) is a protein that is involved with actin formation and the process of endocytosis. In *Drosophila Schneider 2* cells, targeted knock-down of SH3PXYI resulted in the formation of protrusions around the cell. Intriguingly, over-expression of SH3PXYI also resulted in the formation of dramatic protrusions. It is unclear whether SH3PXYI plays similar roles in filopodia formation *in vivo*. Follicle formation in *Drosophila* ovaries requires the activity of escort cells: triangular cells with long thin filopodia that wrap new germ cells and assist in their encapsulation by somatic follicle cells. Preliminary studies in my lab demonstrated that SH3PXYI mutants have increased escort cell number and follicle encapsulation defects. The purpose of this research is to determine the effects that overexpression of SH3PXYI will have on escort cells. My hypothesis is that the overexpression of SH3PXYI will cause escort cells to have similar morphology changes that were seen in the preliminary results from overexpression of SH3PXYI in Schneider 2 cells. In order to test this hypothesis, I will conduct fly husbandry to create fly lines that have overexpression of SH3PXYI specifically in escort cells. I will then use immunofluorescence to mark the escort cells in SH3PXYI-overexpressing mutants and control flies and determine if the overexpression of SH3PXYI results in increased number of escort cells or altered morphology. These studies can help us understand the biological role of membrane curvature, with future applications in cancer biology.

UP112

Dietary control of cell cycle dynamics in stem cells, *Taylor Hinnant, Arturo Alvarez, Elizabeth T. Ables, East Carolina University, Greenville, NC*

Environmental exposure and genetic background are determining factors in human health and overall body function. Adult tissue-specific stem cells are also influenced by such factors, but the molecular mechanisms that control the response to environmental influences remain unclear. Because of the ability for *in vivo* study, as well as their similarities to human adult stem cells, ovarian germline stem cells (GSCs) of *Drosophila* serve as an exceptional model for adult stem cell experiments. To further understand the effects of organismal nutrition on GSCs, we placed female fruit flies on a high sugar diet that elicits an altered metabolic physiology mimicking human diabetes and found they have greatly reduced levels of egg production. This data suggests that the proliferation

of GSCs is altered in response to a high sugar diet. To further test and quantify the GSC response to a high sugar diet, we are using a combination of molecular markers and fusome morphology to study stem cell proliferation. These findings give rise to further understanding mechanism and treatments of human metabolic disorders.

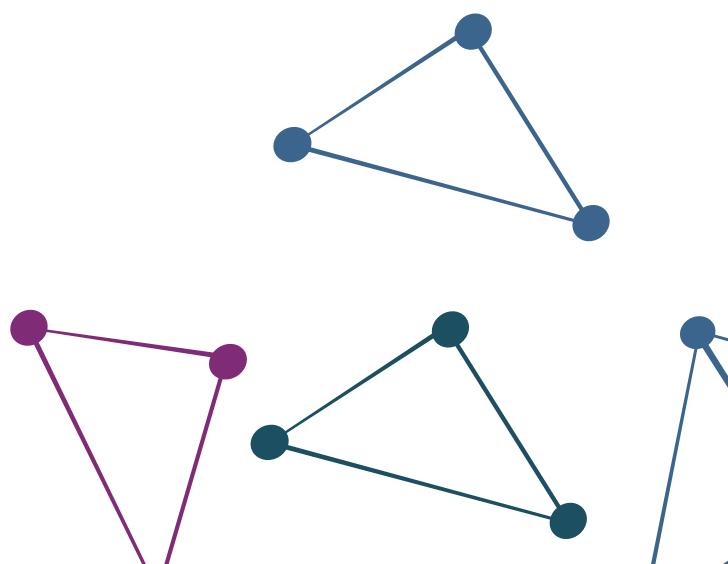
UP113

Identification of Damaged DNA Adducts from Exposure to Benzo[a]pyrene in the TP53 gene, *Lea Witherington Taylor, East Carolina University, Greenville, NC*

Benzo[a]pyrene is a carcinogen associated with tobacco smoke that can damage DNA after it is metabolized by enzymes into highly reactive forms. Identifying the resulting DNA adducts can give greater insight into the mutations and cellular carcinogenesis that frequently occurs in lung cancer.

The purpose of this research is to identify damaged DNA adducts from exposure to benzo[a]pyrene in a key sequence of the TP53 gene. This gene codes for the p53 protein, a tumor suppressor, which is frequently mutated in cancers. Previous and current research in the Hvastkovs lab is aimed at generating a biosensor to detect DNA damage at specific DNA sequences via exposure to bioactivated metabolites generated *in situ* (enzymes and DNA on the biosensing surface). Identification of the damaged DNA adducts will aid in validating the electrochemical biosensor signal, confirming that it occurs as a result of the DNA damage and not another factor.

Polystyrene microspheres were treated with layers of cationic PDDA polymer, the oligomeric DNA sequence, and myoglobin. Each component was adsorbed via exposure to individual solutions and they bind to the spheres electrostatically. Myoglobin acts as an heme enzyme mimic, and is a cheaper alternative and provides similar chemistry to cytochrome P450 enzymes that are involved in the metabolism of substances like benzo[a]pyrene. Adsorption of DNA and myoglobin on the spheres enhances the kinetics of the reaction as it allows higher concentrations of enzyme and DNA in a small volume. The spheres were exposed to benzo[a]pyrene and hydrogen peroxide (to activate the myoglobin) for a desired period of time. DNA adducts were released via acid hydrolysis with HCl, collected via centrifuge filtration, and extracted using ethyl acetate. The findings obtained using LC-MS (Waters UPLC-MS QToF) will be discussed.



PREDICTORS OF BONE GEOMETRY IN RUNNERS,

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Introduction: Tibial stress fractures have been linked to multiple risk factors including reduced bone geometry, including cross sectional area (CSA) and area moments of inertia. Current musculoskeletal models of bone strain apply external loads experienced during activity to a computer simulation of bone; bone geometries are key inputs to such models. Unfortunately, subject-specific measures of bone geometry can be costly and may involve participant exposure to radiation.

Objective: The purpose of this on-going study is to identify key demographic, anthropometric, and bone loading patterns that best predict tibial bone geometries. Dependent variables of interest included cortical CSA, maximum moment of inertia (I_{max}), and minimum moment of inertia (I_{min}).

Methods: Anthropometric measurements, magnetic resonance images (MRI), and bone loading history questionnaires have been obtained from 15 healthy female runners, ages 18-35 years. Anthropometrics obtained included: height, mass, tibia length and width, malleoli width, and calf and hip circumference. The MRI slice that corresponded to the distal 1/3 of the tibia was processed in ImageJ to obtain CSA, I_{max} and I_{min} . Anthropometrics and bone geometries were measured three times, and averaged for analysis. Bone loading scores were obtained using the Bone-specific Physical Activity Questionnaire (BPAQ). Significant predictors of bone geometries were assessed for co-linearity prior to entry into a stepwise linear regression model to identify key predictors.

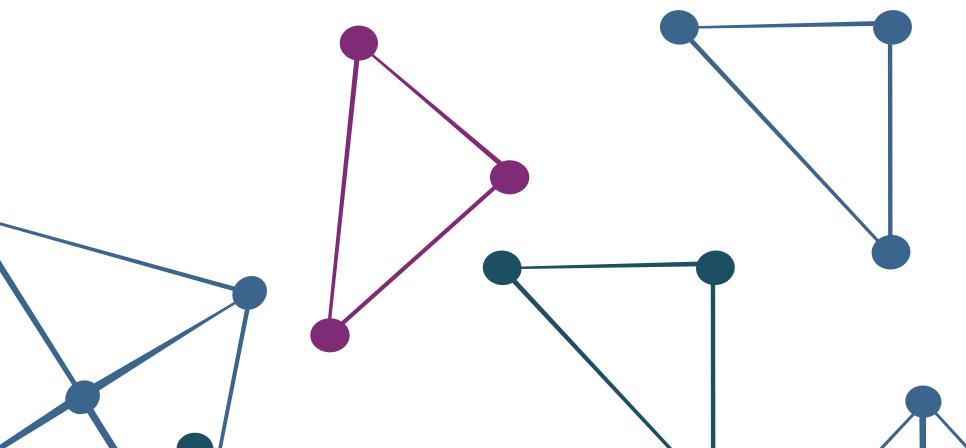
Results: Average CSA, I_{min} , and I_{max} , were 220.50 mm², 5710.49 mm⁴, and 10851.29 mm⁴ respectively. Circumference at the proximal 1/3 of the tibia and the length of the tibia were key predictors of CSA (Adj R²=0.622, p=.001) and I_{max} (Adj R²=0.620, p=.001). The key predictors for I_{min} (Adj R² =0.813, p<.001) included the height, age, and the malleolar width. Given standard error of the estimates corresponding to 19.15 mm² for CSA, 738.57 mm⁴ for I_{min} and 2222.77 mm⁴ for I_{max} , use of these predictors should result in an estimate that predicts CSA within 9%, I_{min} within 13% and I_{max} within 20%.

Conclusions: A preliminary prediction equation using readily obtainable information was developed to predict the bone geometry measures needed for the subject-specific computer simulation with moderate accuracy.

Continued research with larger sample sizes is needed to better refine these prediction equations.

The Characterization of the Resolution Macrophage in Hepatic Fibrosis Reversal, Caroline P. McCall, East Carolina University, Greenville, NC

Hepatic fibrosis refers to the accumulation of collagen in liver that precedes cirrhosis, the irreversible stage of liver fibrosis. Until recently, human liver fibrosis reversal was rarely observed; therefore little is known about the mechanism. Based on *in vivo* observations, macrophages likely contribute to the fibrosis resolution process by regulating cytokine and extracellular matrix remodeling proteins. Understanding the regulation of the macrophage phenotypic shift from a pro-inflammatory state to a resolution state would allow for therapies to be designed to target this unique cell population to not only facilitate reversal but also protect against liver fibrogenesis. The purpose of this research project is to investigate a novel population of macrophages, which are involved in the process of liver fibrosis reversal. The objective of this project is to characterize these cells in a unique cell culture model. The overall hypothesis is that the resolution macrophage directly produces cytokines, chemokines, and matrix remodeling proteins (MMPs), which are involved in the resolution of fibrosis. In this experiment, bone marrow derived macrophages (BMDMs) were isolated from a C57Bl/6 wild type mouse. BMDMs were treated in conditions that induced either a pro-inflammatory phenotype or resolution phenotype, using LPS+IFN- or IL4. Gene expression profiles of these macrophages were measured, and broadly characterized at 4 and 24 hours after treatment. qPCR gene expression profiles of LPS+IFN- induced inflammatory mediators (i.e. TNF, IL12, iNOS, CCL2), whereas IL4 induced resolution cytokines (i.e. IL4, IL10, arginase). Matrix metalloproteases (MMPs), specifically MMP3 and MMP13, were induced by LPS+IFN-, whereas MMP12 was induced by IL4. Importantly, TIMPI, an inhibitor of MMP activity, was strongly induced by LPS+IFN-. This characterization of the gene expression profiles will lead to further understanding of the regulation of resolution macrophage phenotype.



UP116

Mutations in Drosophila Mcm10 effect the formation of chromatin, Sidney Ethan Bedsole, East Carolina University, Greenville, NC

Mcm10 has been shown to be involved in both DNA replication and the establishment of chromatin states. To date most of the research on Mcm10 has focused on understanding its replicative roles, leading to speculation about Mcm10's potential chromatic functions. As our understanding of epigenetics increases, the importance of chromatin formation on genome stability has become more apparent. For this reason, a thorough understanding of Mcm10's function in the formation of chromatin may provide insight into mechanisms of oncogenesis, since aberrant Mcm10 expression has recently been observed in many types of cancers. This project focused on mapping the portions of Drosophila Mcm10's C-terminal domain (CTD) involved in the establishment of endogenous chromatin states. To address this question, we have evaluated the impact of 20 different C-terminal point mutations on the formation of chromatin using three different experimental approaches. A white-mottled-4 position effect variegation (PEV) assay allowed us to evaluate the impact that the point mutations had on the formation of heterochromatin spectrophotometrically using the amount pigmentation in the adult eye. We were able to assess the packaging of DNA in endoreplicating tissue by evaluating the mass of DNA per unit volume in the nuclei of salivary glands from third instar wandering larvae. Furthermore, we were able to observe the presence of condensation defects in DAPI stained mitotic chromosomes present in the central nervous system of third instar wandering larvae. The data compiled from these investigations suggest that the CTD of Drosophila Mcm10 is important for proper packaging of DNA into chromatin in these different tissues. These results combined with the known replicative roles of Mcm10 provide support for the idea that Mcm10 mis-regulation is likely correlated with cancerous states; as stressed DNA replication and improper chromatin establishment can have serious impacts on genome stability and function. These results add to a growing body of evidence suggesting that Mcm10 serves multiple important functions both in and out of DNA replication in eukaryotes.

UP117

The effect changes in sodium concentrations have on mitochondria., Teresa R Heavilin, Dr. Richard McCabe, Dr. Mary Farwell, East Carolina University, Greenville, NC

Overproduction of superoxide anions in mitochondria cells can give rise to atherosclerosis; hardening of the arteries. Atherosclerosis is the major cause for stroke, peripheral artery disease and heart attack. Superoxide anions are produced naturally in mitochondria and the organelle has defenses to control the amount of superoxide anions in the mitochondria. However, an overproduction of superoxide anions

overwhelms the organelle's defenses. A low overproduction of superoxide anions can cause oxidation of fatty acids; which leads to atherosclerosis. A larger overproduction of superoxide anions can lead to malfunctions in mitochondria, oxidative stress, and eventually cell death. Previous studies have focused on free radical scavengers; like vitamins A & E. However, little research has been done to discover what can cause an overproduction of superoxide anions. This is important because if we can determine what causes a significant increase in overproduction of superoxide anions we can prevent this condition instead of treating it after overproduction happens. Previous research indicates that sodium acts on the mitochondria via the sodium-calcium exchange. Based off of this knowledge, we hypothesize that an increase in sodium concentration will result in an increase of superoxide anion production in mitochondria. We want to establish if there is a specific sodium concentration will lead to a significant increase in superoxide anions compared to the other sodium concentrations. To determine this, we isolate mitochondria from chicken livers at the centrifuge speed of 3000 rpm. Next we perform an assay using a 96 micro-well plate. Each well has a different sodium/potassium ratio and 10 μ L of mitochondria. The potassium is used to prevent changing the ionic strength of the medium. The plate is then read at 450 nm and 492 nm in a ChroMate microplate reader to measure the amount of superoxide anions produced in each well. Preliminary data suggests that sodium does interact with the mitochondria to produce superoxide anions.

UP118

DIFFERENCES IN TOTAL HORIZONTAL BAR DISPLACEMENT DURING A POWER CLEAN BETWEEN COMPETITIVE AND RECREATIONAL WEIGHTLIFTERS, Robert Leonard¹, Tayler Snipes¹, Charles Kemble¹, Joshua Leonardi², Patrick Rider.¹

¹East Carolina University, ²National Institute for Occupational Safety and Health East Carolina University, Greenville, NC

Introduction: High intensity weightlifting has grown in popularity with recreational exercisers. This style of training often includes performing power cleans. Studies have shown that one of the key kinematic components of a proper power clean bar path includes posterior horizontal displacement. Although the importance of this horizontal movement has been explored, there have not been any studies that compare the total horizontal displacement exhibited by competitive weightlifters with those of recreational weightlifters.

Purpose and Hypothesis: The purpose of this study was to analyze the difference in horizontal displacement during a power clean between competitive and recreational weightlifters. We hypothesized that competitive lifters would have a larger rearward displacement than recreational lifters.

Methods: 3 males and 3 females between the ages of 18-35 years old were selected to participate in one of two experimental groups, competitive or recreational. Participants that had received at least 6 months of training from a qualified coach were placed in the competitive group. Recreational

athletes were those who have regularly completed the lift within the past 3 months but had not received consistent coaching. Each athlete completed four single power clean trials at 70% I-RM to simulate a typical training load. Biomechanical data were recorded using two AMTI force plates and a motion capture system. Each trial included a 60 second rest period to minimize fatigue between trials. Bar path was analyzed to determine horizontal displacement during the pulling phases of the lift.

Results: Recreational lifters exhibited less rearward displacement and more variance than competitive weightlifters. The average rearward displacement found in recreational lifters was $0.01 \text{ m} \pm 0.02 \text{ m}$. Competitive lifters had an average rearward displacement of $0.04 \text{ m} \pm 0.01 \text{ m}$.

Conclusion: Our hypothesis was supported in this initial sample. Competitive lifters' rearward displacement was four times greater than recreational lifters'. Competitive weightlifters also exhibited less variability than recreational lifters indicating that they were more consistent in their bar path movements.

UP119

Nicotine control of germline cell fate in *Caenorhabditis elegans*, Robert A Kobel¹, Myon-Hee Lee², and Xiaoping Pan¹

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Nicotine dependence is the single largest cause of preventable death in the world, claiming 480,000 lives each year in the US alone, including those caused by secondhand smoke. In this study, we investigated the biological effect of nicotine on germ cell fate specification using the gonad of the nematode *C. elegans* as a model system.

Wild-type hermaphrodites produce both sperm and oocytes. They are therefore self-fertile. However, a mutant lacking PUF-8 (Pumilio RNA binding protein) and LIP-1 (ERK phosphatase) produce only sperm, resulting in sterility (Mog phenotype) at a permissive temperature (20°C). Remarkably, this puf-8; lip-1 mutant develops germline tumors via the dedifferentiation of spermatocytes at a restrictive temperature (25°C). Using this mutant, we investigate the effect of nicotine on germ cell fate specification. First, we treated puf-8; lip-1 homozygotes with different concentrations of nicotine at 25°C and analyzed the germline phenotypes by germline staining. Interestingly, most puf-8; lip-1 mutants exposed to 200uM or less nicotine developed germline tumors via dedifferentiation as seen in control. However, 2mM nicotine exposure significantly reduced germline tumor frequency, instead showing the Mog phenotype. Moreover, 2mM nicotine changed fertile puf-8+/; lip-1(-/-) heterozygotes into Mog sterile (~40%). These results hypothesize that high nicotine doses reprogram germ cells with germline tumor or oogenic potential into germ cell with sperm fate. Our future plan will include: 1) understanding a molecular mechanism of how nicotine reprograms germ cell fate. 2) Identification of genes that are regulated by nicotine. Therefore, our results and future plan will address the potential effect of nicotine on cell fate specification in other model systems broadly.

UP120

Investigating the Role of CtBP in Colorectal Cancer, Ashley

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Recent studies in breast cancer tissue have demonstrated that C-terminal binding protein (CtBP) expression induces stem cell-like features and genome instability, whereas CtBP depletion or caloric restriction reverses gene expression and increases DNA repair. C-terminal binding proteins (CtBP) are dimeric nuclear factors that function as transcriptional regulators in response to changes in the cellular level of NADH. Based on the binding affinity of CtBP for NADH, CtBP can function as a sensor of cellular metabolism and therefore has the potential to act as a metabolic marker in known obesity-related cancers. Thus we decided to study CtBP expression and localization in colorectal cancer, a known obesity-related cancer.

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the second leading cause of cancer death in men and women combined in the U.S. To study CtBP expression, we first interrogated a panel of 5 CRC cell lines (HCT116, SW480, HCT15, CACO2, HT29) for CtBP I and 2 cellular localization in addition to a breast cancer (MCF-7) and lung cancer (NCI-H1299) cell line for comparative purposes. From these localization experiments we determined that neither CtBP I nor 2 were found in the nucleus in the CRC cell lines studied, in contrast to the breast and lung cancer cell lines, where they were found in the nucleus. Furthermore, simultaneous knockdown of CtBP I and 2 had no effect of the mRNA expression of known CtBP targets, suggesting it was not functioning as a transcription repressor in these cells. Based on these findings, we conclude that CtBP does not act as a transcriptional regulator in the colorectal cancer cell lines tested. To investigate the therapeutic implications of this finding, we treated the panel of cancer cell lines with known inhibitors of CtBP and performed MTT assays at 24, 48, and 72 hours to determine the level of cell death. Interestingly, the lung cancer cell line showed an increased sensitivity to the CtBP inhibitor NSC-95397 when compared to the colon cancer cell lines, thus further suggesting that targeting CtBP in colon cancer may be ineffective and alternative approaches should be considered.

UP121

Determination of GdN@C(OH) interaction with Cu²⁺ via Fluorescence measurements, Kimberly Valle Mejia, East Carolina University, Greenville, NC

Today MRI imagining techniques are capable of discerning between abnormal and normal complex tissues by providing contrasting images of these tissues. One drawback of using MRI imagining is its low sensitivity. However, this sensitivity can be greatly enhanced by introducing a contrasting agent who can provide a new pathway for water molecules to relax significantly faster and hence generate the desired "contrast" between healthy and unhealthy tissues. We report the first ever recorded fluorescence emission spectrum of GdN@C(OH) interacting with Cu²⁺. Our emission data indicates that the Cu²⁺-GdN@C(OH) interactions lead to fluorescence enhancement via a static quenching mechanism. The binding constant, K_b, on the other hand, was found to be of the same magnitude as interactions between human serum albumin and small organic acid but quite different, several orders of magnitude smaller, than protein nanoparticle complexes. Interestingly, the binding number, n, was found to be approximately 1.0. The data also indicated an extremely fast rate constant on the order of 1010 L mol⁻¹ s⁻¹ which is outside of the diffusion-control regime. These results are presented within this presentation.

UP122

The Effects of Complex Learning on Hippocampal Neurogenesis in a Mouse Model of Alzheimer's Disease, Tucker Johnson¹, Keith Jones¹, Lidia Ortega^{1,2}, Natalie Cataldo^{1,2}, JoColl Burgess^{1,2}, Rohan Parkeh¹, Tuan D. Tran^{1,2} ¹Multidisciplinary Studies Program in Neuroscience, East Carolina University, Greenville NC ²Department of Psychology, East Carolina University, Greenville, NC

Much research is dedicated to further the understanding and treatment of Alzheimer's disease (AD). AD is a neurodegenerative disease, characterized by cognitive disturbances such as learning difficulties and memory loss. In recent years, mice which bear PSEN1-M146V, APP-Swe and tauP301L gene mutations (3xTg mouse model) have provided a valuable research tool in understanding the molecular and neurobehavioral features of AD in humans. The research literature shows that a large proportion of effort is funneled into examining pharmacological approaches that potentially mitigate cognitive disturbances in AD, while less attention has been given to non-pharmacological approaches (NPAs). Despite the lower frequency of their examination, NPAs have been shown to yield promising results. One particular NPA, complex cognitive training, has been shown to enhance hippocampal neurogenesis (HN), which in turn, may underlie positive changes in synaptic plasticity that support new learning and

memory formation. The current study compares two forms of associative learning, one simple and the other complex, and their effects on inducing HN in 3xTg mice.

We examined eyeblink classical conditioning (ECC), a form of associative learning that can be varied to assess the functional integrity of different neural circuits. The simple form of ECC, delay, is easier to acquire for mammals and is supported by an intact cerebellum. The complex form, trace ECC, is more difficult to acquire because it requires the organism to resolve the timing of stimuli used in this procedure. It has been well-demonstrated that an intact hippocampus supports this form of learning. Adult 3xTg mice and controls received 4 injections of bromodeoxyuridine (BrdU; 50 µg/g IP) on alternating days. On Day 9, they were implanted with stimulating and recording electrodes for ECC. From Days 11-16, they underwent simple ECC or complex ECC. A separate group of 3xTg and control mice did not receive ECC to serve as training controls. On Day 21, brains were extracted and examined using BrdU IHC. We hypothesize that if complex learning mitigates the neurodegenerative effects of AD, then HN would be enhanced in mice that had received the trace ECC, compared to mice that received delay ECC. Non-pharmacological approaches may be beneficial in ameliorating cognitive disturbances in AD as they are inexpensive, easy to administer, and potentially facilitate neural plasticity underlying enhanced cognitive function.

UP123

Improved Synthesis of Oosporein, Joel David Glotfelter, Dr. Brian Love, East Carolina University, Greenville, NC

Biological activity is a sought after trait in pharmacology and chemical synthesis. This is mainly attributed to the applications that biologically active compounds have in the field of medicine. One such compound is oosporein, which has been shown to have both anti-biotic and anti-viral properties. The current synthesis of oosporein is cost effective and efficient but results in a mere 50% yield of usable product. New methods are being tested that it is hoped will circumvent this issue, resulting in a much higher yield. Improving the synthesis of oosporein may have applications beyond this single compound. In fact, improving the synthesis of oosporein could open the door to obtaining structurally similar compounds that have yet to be synthesized but are thought to have potential biological activity.

UP124

The Effects of High-Fat and High-Sugar Diets and Exercise on the Development of Drosophila First Generation Offspring,

Michelle R. Pike, Henry Nicolae Alarco Jeri, Oksana Williams, Ajay Ajmera, Alexander K. Murashov, East Carolina University, Greenville, NC

With the population's weight increasing, it is imperative to understand the effects of different diets and activity on offspring development and cardiovascular health. While studies have shown maternal diet affect the epigenetics of their offspring's sexual dimorphism and development, evidence suggests that obese and diabetic fathers may also contribute to offspring metabolic phenotype. In this study we questioned how different diets and exercise of fathers may produce an effect on offspring development; including time of development, probability of producing a higher ratio of males or females, and cardiovascular health. *Drosophila Melanogaster* represent a unique model for transgenerational studies because of its well-known genetics, short life cycle, well-defined developmental stages, and fast reproduction rates. Development of the F0 and F1 generations were analyzed by observing the first day of appearance of larvae, pupa, and adult, and by collecting daily larvae and pupa on each tube wall until the first adults hatched. The total number of adults was obtained by counting the number of males and females produced in each tube for nine days after the first adult appeared. Male *Drosophila* fathers in this research were put on high-fat, high-sugar, and control diets for 14 days. The heart rate for F0 and F1 generations was recorded at various times to measure beats/minute. After 14 days of being on a diet, all male flies were mated with control virgin females on control food. The results showed there was a delayed significant difference of $P < 0.001$ in the time required for both larvae and pupa to first emerge in all groups except in F0 and F1 from the high-sugar diet. For the time needed for adults to first emerge, there was a delay with a significant difference of $P < 0.001$ in the F0 and F1 from control and high-fat diets and $P < .01$ in F0 and F1 from high-sugar diets. Differences indicated a significant delay in development in the offspring compared to one another and to the control father group. Results also showed there were no significant differences between the ratio of males and females and overall number of males and females produced from the F0 and F1 groups. Cardiovascular data indicated increased heart rates in F0 high-fat flies compared to control. Overall, the data suggests different diets of fathers have impacts on the rate of development and cardiovascular health of their offspring.

acute clinical subtype, the median survival time is 6 months. We found that HTLV-I infected cells and ATL cells abnormally express the transcription factor GATA-4. GATA-4 is from the GATA family of factors that contain a zinc finger DNA-binding domain that binds the consensus DNA site [(A/T)GATA(A/G)]. To activate transcription, GATA proteins recruit the coactivator p300 and its parologue CBP to the DNA. GATA-4 regulates transcription of genes involved in embryogenesis and myocardial differentiation and function. Usually, GATA-4 is not expressed in T-cells, but GATA-3 is. Surprisingly, we found that the HTLV-I infected cells and ATL cells do not express GATA-3. In an effort to understand the role of GATA-4 in HTLV-I infected cells, we focused on the interaction between GATA-4 and p300/CBP. We found that GATA-4 binds to two domains of p300/CBP, the cysteine/histidine domain 3 (CH/3) and the histone acetyl transferase domain (HAT). One of the viral proteins produced by HTLV-I, known as the HTLV-I basic leucine zipper factor (HBZ), also binds the CH/3 and HAT domains of p300/CBP. Using a biochemical assays, we found that GATA-4 and HBZ compete for binding to the CH/3 domain. In luciferase reporter assays, HBZ repressed transcription by GATA-4, which may mean that HBZ prevents GATA-4 from recruiting p300 to the DNA for the activation of transcription. We would like to extend our studies to HTLV-I infected cells and determine whether a subset of GATA-4 can still bind p300 and activate transcription. There are several other viral proteins that are produced by HTLV-I, and GATA-4 may function with one of them at a different time during HTLV-I infection.

UP125

The cellular transcription factor GATA-4 is abnormally express in HTLV-I transformed T-cells, Stephanie T Nguyen, Kimson Hoang, Isabelle Lemasson, East Carolina University, Greenville, NC

Human T-cell Leukemia virus type I (HTLV-I) is a complex retrovirus that infects CD4+ T-cells. A certain subset of infected people will develop a deadly leukemia called adult T-cell leukemia (ATL). ATL is a very aggressive disease and when the patient is diagnosed with the

UP126

Enhanced Protein Shaker, Garrett W Carpenter, David Costa, Larry Gonzalez, East Carolina University, Greenville, NC

In today's economy there are more and more individuals trying to become more active. Whether it's an individual who is trying to fit in some gym time after work or a college student playing sports after school, living an active lifestyle requires several things but one of the most important is protein intake. Protein shakers have almost become an active person's best friend. There are several options to choose from on the market today but, they all have the same underlying problem. All existing protein shakers have sharp corners located in the base of the cup. This permits protein powder to get trapped and not fully blended. Anyone who has experienced this knows the frustration of seeing your expensive protein powder clumped up at the bottom of your shaker being "wasted". Our innovative design addresses that issue by embracing a curved bottom where particulate matter cannot be trapped. With the bottle comes a uniquely designed mixing ball that breaks up chunks of protein powder for a smooth liquid blend. Shaped to fit the contour of the bottle, the mixer will be able to uniformly infuse whatever mix you add. To allow the bottle to be stood upright like conventional containers, we have integrated a flat screw-on reservoir onto the bottom, allowing the user to store a choice amount of drink mixes. Though the shakers main purpose is to blend your protein we aimed to take our product a step further. This step was to make the bottle insulated with a multilayer construction for any situation or need, from hot coffee and tea to ice water. We have also designed the space located within the threaded shaft just to allow storage of a Keurig K-cup. This allows for the individual to grab their shaker in the morning, drink their coffee, simply rinse it out, take it to the gym and mix up their protein. An all in one container for an active lifestyle.

UP127

Process Flow Improvement for Keihin, Nancy J Smith, Armon Shirbabadi, Harrison Crist, East Carolina University, Greenville, NC

Background: Keihin Carolina System Technology is an electronic assembly manufacturer based in Tarboro, NC. The company uses advanced robotics technologies and automated manufacturing processes to lead the industry in quality performance and to provide world-class products. Keihin is experiencing an influx of final assembly products to the point where the storage area is beginning to overflow. This causes employees to waste valuable time to find alternate locations to store the products.

Statement of the Problem: For Keihin, the problem roots from an overabundance of final product combined with the lack of storage within the facility. The ergonomic design of the storage units also cause a potential safety hazard for the operator. Throughout the project we plan to determine the most efficient and safe process flow for this facility. We plan on collecting data on cycle times, overall equipment efficiency, change over times, inventory, and interviewing current employees for viable input.

UP128

Improved Spent Primer Cup, Anthony Edward Lovitt, Mickey Whitfield Connor Jr, East Carolina University, Greenville, NC

With the price of ammunition continuing to rise, more and more people are getting into the hobby of reloading their own ammunition. Reloading has become a hobby of ours. It can be a lot of fun to reload your own ammunition much cheaper than can be bought in a store. Reloading ammunition is the process of taking spent casings and putting new components into the casing to create a round that can be fired. The process can take some time to learn and perfect, but better quality ammunition can be produced. Also these reloaded cartridges can be tailored to a specific firearm to create a cartridge that shoots very well and very accurately. Many people who shoot competition will load their own ammunition in order to shoot accurately and hopefully win. Shooting can be a recreational hobby that can be a lot of fun for anyone. There are several brands of reloading presses and accessories. We have a Dillon RL 450.

The Dillon RL 450 has what is called a spent primer cup attached to the link arm. These rectangular cups are used to catch spent primers knocked out of the casings. The cup does a pretty good job at catching primers except sometimes the primers will be thrown all over the floor. Therefore the cup needs a back plate extended up in the back in order for the primers to hit and fall into the cup. Think of the back plate as a chute that guides the primers into the cup.

We tested our theory with a standard spent primer cup with a piece of paper folded and taped to the back to act as a guide for the primers to hit and fall into the cup. After doing that the amount of primers that were thrown on the floor was cut by 75%. However we would like to make a one piece unit so the paper does not tear off from the tape.

The spent primer cup has another issue. It fills up very quickly. The cup can be a little aggravating to get on and off which can cause a full cup to be spilled. A full cup can hold a few hundred primers easily. Spilling that many primers can take time to clean up and hurt when stepped on. We are planning on adding a funnel shape to the bottom of the cup that a clear piece of rubber hose can be connected to. The hose would then be connected to the cup and then placed in a bucket or contained under the table where it can't be knocked over.

This would allow more cartridges to be reloaded without spilling primers or having primers thrown all over the floor. With the improved version less time would be spent cleaning up a mess and more time spent loading.

UP129

Building Material Proposal for Lake James State Park, Travis Lee Eudy, East Carolina University, Greenville, NC

When traveling in the forest, mountains, or go on any camping trip the last thing someone expects to see is a mansion that looks as if it belongs in Beverly Hills. Instead people expect to see natural looking buildings, or cabins. Many of these structures are built with natural materials such as

wood, brick, or stone. Lake James State Park is designing a visitor's center for their park. Through this research I will propose my own solution to one of their design challenges; the challenge involves creating the building in a way so that the building not only reflects the surrounding environment but also promotes efficiency and visual appeal. Although this could be done in many different designs and combination of materials I am going to investigate, and research many types of these materials. Most of the materials that will be examined are natural material, such as wood. But also, some materials that may be overlooked such as straw or rammed earth will be researched. The research performed within this paper will be primarily composed of secondary research which will be used to explore and analyze the data in order to make an accurate decision on the material choice for the Lake James State Park. In order to efficiently and accurately decide on materials for the visitor's center some questions will have to be asked. Such questions include: What materials and design will best reflect the surrounding environment and culture of the park? How can this design reflect environmental and cultural surroundings and be visually appealing, and energy efficient? One material that was highly looked into and used was wood. In CORRIM's research he evaluated a home built with wood against one built with steel for a cold climate test and a concrete home for a hot climate test. The results were that "For the Minneapolis test houses, the steel design had 17% total higher embodied energy than the wood design (764 GJ for steel compared to 651 GJ for wood). In Atlanta, the concrete design had 16% higher total embodied energy than the wood design (461 GJ for concrete compared to 398 GJ for wood)." (Hall). This shows how wood can be great for North Carolinas climate since NC experiences cold winters and hot summers. Not only is the material efficient but it also reflects nature and looks proper for campground or cabins.

UP130

Detection and Classification of Moving Train Cars, *Timothy Wade White, East Carolina University, Greenville, NC*

Railway companies and government transportation departments are often interested in knowing the number of uniform cargo trains versus non-uniform trains they have going through a certain area. These data allow them to determine the flow and general grouping of train cars, which can further help them to optimize train flow and minimize fuel cost. This project develops image-based approaches that quantitatively analyze moving train cars on a railway. The MATLAB software utilizes three key components, blob Analysis, Kalman filters and probability calculation, to track train cars in motion and compare the sizes of each car to a database of known cars in order to determine its type and the number of similar cars that are grouped together. In the demonstration, the developed software analyzes individual image frames from an .mp4 video file of a train passing perpendicularly by on tracks and immediately displays the same video back with data and bounding boxes surrounding each train car. This software has many other potential real world applications, ranging anywhere from biological cell counting to tracking star locations in the sky, in that it is meant for object detection.

UP131

Benefits of Smart Glass on East Carolina's Campus., *Nicholas Robert Corigliano, East Carolina University, Greenville, NC*

Looking at the Science and Technology Building on ECU's Campus, there are some major possibilities for more sustainability. In attempt to create a building that has maximized utility for the students as well as the staff and faculty of the program, I have conducted research in certain aspects of design. This research was conducted in a few key ways; first research was conducted on new developments in building materials that could be implemented into the design process so the building would be superior in efficiency. The material that I thought would have the biggest impact is a new material called smart glass. To think, a window could create an interior environment that would provide optimal lighting but still retain the thermal properties of the room. The question is, how much of a difference does this glass actually make? Or how difficult is it to incorporate into a project? To answer these questions surveys from staff members and students were conducted in order to find if the natural outside lighting would create a better learning environment. Concluding, this glass could be revolutionary in energy efficiency and is the future for ECU to incorporate into their buildings.

UP132

Innovative Product Solutions, *Brian Miles Greene, East Carolina University, Greenville, NC*

Going shopping is something that everyone does usually at least once a week, whether it be because they need something from the grocery store, or they want to go shopping for new clothing, shoes, electronics. The options of what people can go shopping for are endless. One of the biggest problems that we run into today is having to carry everything that is purchased around with you, if you are shopping with your friends or it takes multiple trips to unload your car if you are coming home from the store. Not to mention most college students use university transportation, which means they must carry everything with them on a bus. If you are carrying multiple bags this can become very cumbersome and hard to deal with.

The solution is the hand saver it is a design that we are currently working on to help make it easier for people to carry bags around if they are shopping, on the bus on the way home from shopping, or just unloading the car after a regular trip to the grocery store. This product is designed to fit to your hand naturally with a memory foam grip design it makes it comfortable to hold. There are large hooks that are pointed out an upwards for you to be able to hang multiple bags on to not only save your fingers, and your hands when carrying bags, but it will also allow you to carry multiple at one time without them hitting your legs or hurting your hands. This design will not only help to save your hands from hurting after carrying multiple heavy bags, but it will also save you time and effort.

Abumohsen, Abir	<u>32</u> , <u>69</u>	Clauser, Amanda	<u>30</u> , <u>58</u>	Haskin, Grace	<u>45</u> , <u>140</u>
Adams, Emily	<u>37</u> , <u>101</u>	Clements, Katie	<u>44</u> , <u>136</u>	Hauser, Megan	<u>47</u> , <u>150</u>
Adams, Stephanie	<u>40</u> , <u>116</u>	Cochran, Lauren	<u>35</u> , <u>87</u>	Hawkins, Jonathan	<u>52</u> , <u>177</u>
Ajmera, Ajay	<u>44</u> , <u>138</u>	Cofield, Dazzala	<u>42</u> , <u>130</u>	Hayden, William	<u>53</u> , <u>182</u>
Akland, Mark	<u>37</u> , <u>100</u>	Coghill, Elizabeth	<u>33</u> , <u>75</u>	Hayek, Meredith	<u>36</u> , <u>92</u>
Allen, Nicole	<u>33</u> , <u>75</u>	Colbert, Lauren	<u>30</u> , <u>56</u>	Heavilin, Teresa	<u>53</u> , <u>188</u>
Amin, Aenia	<u>44</u> , <u>138</u>	Conner, Blaire	<u>49</u> , <u>159</u>	Hedayati, Hooman	<u>34</u> , <u>79</u>
Anderson, Arden	<u>33</u> , <u>73</u>	Cope, William	<u>51</u> , <u>171</u>	Helms, Amelia	<u>41</u> , <u>124</u>
Andrews, Morgan	<u>38</u> , <u>106</u>	Corbett, Brooklyn	<u>39</u> , <u>111</u>	Henderson, Amy	<u>41</u> , <u>122</u>
Anstead, Bryan	<u>51</u> , <u>175</u>	Corigliano, Nicholas	<u>54</u> , <u>193</u>	Hendricks, Sydney	<u>47</u> , <u>149</u>
Anthony, Allison	<u>51</u> , <u>169</u>	Cornette, Christopher	<u>38</u> , <u>102</u>	Hindes, Haley	<u>37</u> , <u>95</u>
Appleton, Laurel	<u>39</u> , <u>114</u>	Cross, Taylor	<u>52</u> , <u>180</u>	Hinkley, James	<u>41</u> , <u>122</u>
Atwell, Michaela	<u>47</u> , <u>153</u>	Cunius, Leigh	<u>33</u> , <u>74</u>	Hinnant, Taylor	<u>53</u> , <u>186</u>
Axtman, Samuel	<u>52</u> , <u>179</u>	D'Alessandro, Alyssa	<u>38</u> , <u>102</u>	Hoffert, Christina	<u>51</u> , <u>171</u>
Bailey, Gregory	<u>32</u> , <u>68</u>	Dasari, Anvesh	<u>31</u> , <u>62</u>	Hoggard, Jason	<u>31</u> , <u>62</u>
Bailey, William	<u>32</u> , <u>70</u>	Daughtrey, Emma	<u>48</u> , <u>158</u>	Holland, Nathan	<u>42</u> , <u>131</u>
Baker, Kellie	<u>48</u> , <u>157</u>	Davis, Patrick	<u>41</u> , <u>123</u>	Holland, Tessa	<u>40</u> , <u>119</u>
Balestrieri, Kassondra	<u>41</u> , <u>121</u>	DeHart, Destiny	<u>46</u> , <u>146</u>	Holt, Andrew	<u>41</u> , <u>125</u>
Banks, Gregory	<u>32</u> , <u>69</u>	Demor, Suelen	<u>30</u> , <u>59</u>	Hooper, Sarah	<u>32</u> , <u>81</u>
Barbour, Terry	<u>39</u> , <u>109</u>	Dierolf, Karina	<u>50</u> , <u>164</u>	Horton, Sarah	<u>48</u> , <u>157</u>
Barefield, Layne	<u>52</u> , <u>178</u>	Dietrick, Erika	<u>51</u> , <u>174</u>	Huang, Tai-Yu	<u>40</u> , <u>117</u>
Bartol, Karleen	<u>53</u> , <u>187</u>	Ding, Queying	<u>43</u> , <u>132</u>	Huang, Yi	<u>40</u> , <u>118</u>
Beasley, Brett	<u>32</u> , <u>80</u>	Dorismond, Vanessa	<u>38</u> , <u>106</u>	Huf, Mikayla	<u>53</u> , <u>184</u>
Becak, Daniel	<u>41</u> , <u>122</u>	Dunbar, Glee	<u>36</u> , <u>88</u>	Hughes, Jasmine	<u>53</u> , <u>186</u>
Becker, Matthew	<u>36</u> , <u>88</u>	Dupree, Courtney	<u>45</u> , <u>141</u>	Idol, Coy	<u>34</u> , <u>77</u>
Bedsole, Sidney	<u>53</u> , <u>188</u>	Eakins, Casey	<u>51</u> , <u>170</u>	Ingle, Alexandra	<u>32</u> , <u>69</u>
Bellamkonda, Srilekha	<u>52</u> , <u>178</u>	Edwards, Meredith	<u>47</u> , <u>154</u>	Ingle, Jared	<u>50</u> , <u>167</u>
Benfield, Beau	<u>42</u> , <u>130</u>	Elhassanny, Ahmed	<u>30</u> , <u>60</u>	Inkster, Jaclyn	<u>30</u> , <u>57</u>
Bernetski, Elizabeth	<u>51</u> , <u>172</u>	Ervin, Martha	<u>47</u> , <u>149</u>	Israel, Ashleigh	<u>31</u> , <u>66</u>
Biggs, Stephanie	<u>35</u> , <u>86</u>	Escobedo, Rene	<u>53</u> , <u>183</u>	Jauss, Charles	<u>49</u> , <u>159</u>
Binaxas, Kyle	<u>48</u> , <u>156</u>	Eudy, Travis	<u>54</u> , <u>192</u>	Jewell, Jessica	<u>45</u> , <u>141</u>
Bivins, Tamara	<u>36</u> , <u>90</u>	Falgiano, Summer	<u>45</u> , <u>141</u>	Johnson, Adam	<u>46</u> , <u>145</u>
Bizzell, Margaret	<u>39</u> , <u>109</u>	Farley, Mengyuan	<u>38</u> , <u>107</u>	Johnson, Holly	<u>52</u> , <u>182</u>
Blake, Bevin	<u>30</u> , <u>57</u>	Ferey, Jeremie	<u>31</u> , <u>65</u>	Johnson, Rachel	<u>33</u> , <u>74</u>
Blank, Zachary	<u>36</u> , <u>91</u>	Ferrara, Patrick	<u>40</u> , <u>115</u>	Johnson, Tucker	<u>54</u> , <u>190</u>
Boota, Isaac	<u>44</u> , <u>137</u>	Field, Sterling	<u>37</u> , <u>96</u>	Jones, Scott	<u>30</u> , <u>58</u>
Bostick, Kimberly	<u>49</u> , <u>162</u>	Finger, Danielle	<u>40</u> , <u>115</u>	Josey, Madison	<u>50</u> , <u>168</u>
Bowersock, Collin	<u>35</u> , <u>84</u>	Firnhaber, Jessica	<u>49</u> , <u>163</u>	Julian, Cara	<u>39</u> , <u>112</u>
Boyd, Morgan	<u>51</u> , <u>173</u>	Flanagan, Suzan	<u>34</u> , <u>78</u>	Karas, Kristin	<u>49</u> , <u>162</u>
Branch, Emily	<u>32</u> , <u>81</u>	Flannery, Elisabeth	<u>36</u> , <u>93</u>	Karpa, Alyssa	<u>32</u> , <u>71</u>
Brinkley, Scott	<u>37</u> , <u>98</u>	Flynn, Michael	<u>30</u> , <u>59</u>	Keesling, Madison	<u>45</u> , <u>144</u>
Brisson, Brittany	<u>50</u> , <u>165</u>	Fortner, Amanda	<u>30</u> , <u>56</u>	Kelleher, Colleen	<u>37</u> , <u>97</u>
Britt, Matthew	<u>53</u> , <u>182</u>	Frisco, Nicole	<u>35</u> , <u>84</u>	Kelly, Nicholas	<u>38</u> , <u>102</u>
Brown, Addison	<u>32</u> , <u>79</u>	Fry, Nathaniel	<u>41</u> , <u>127</u>	Keziah, Logan	<u>39</u> , <u>108</u>
Brown, Emily	<u>36</u> , <u>94</u>	Garner, Ethan	<u>45</u> , <u>142</u>	Kim, Do Hyung	<u>41</u> , <u>124</u>
Brown-Pickren, Elizabeth	<u>39</u> , <u>109</u>	Gawdi, Rohin	<u>53</u> , <u>185</u>	Kobet, Robert	<u>53</u> , <u>189</u>
Bryan, Alex	<u>52</u> , <u>179</u>	Geddes, Andrew	<u>50</u> , <u>166</u>	Kothadia, Radhika	<u>52</u> , <u>180</u>
Burch, Amber	<u>51</u> , <u>170</u>	Gill, Kristalyn	<u>45</u> , <u>140</u>	Krewson, Elizabeth	<u>40</u> , <u>120</u>
Burgess, JoColl	<u>53</u> , <u>185</u>	Gilman, Michell	<u>39</u> , <u>113</u>	Krider, Angela	<u>46</u> , <u>146</u>
Burnette, Payton	<u>44</u> , <u>140</u>	Glass, Jacqueline	<u>48</u> , <u>154</u>	Kuhlman, John	<u>45</u> , <u>143</u>
Busada, Jonathan	<u>31</u> , <u>61</u>	Glotfelty, Joel	<u>54</u> , <u>190</u>	Ladin, Daniel	<u>31</u> , <u>64</u>
Caddell, Lindsay	<u>48</u> , <u>158</u>	Goehrig, Tori	<u>38</u> , <u>104</u>	Langley, Brandon	<u>44</u> , <u>139</u>
Calameese, Taylor	<u>33</u> , <u>74</u>	Golden, Nicholas	<u>50</u> , <u>168</u>	Lanzo, Lauren	<u>38</u> , <u>108</u>
Caldwell, Kelly	<u>35</u> , <u>82</u>	Goldstone, Simon	<u>33</u> , <u>73</u>	Leicht, Hannah	<u>47</u> , <u>148</u>
Camilleri, Kathryn	<u>50</u> , <u>166</u>	Gower, Georganna	<u>49</u> , <u>161</u>	Leonard, Kelsey	<u>36</u> , <u>93</u>
Carbone, Rebekah	<u>48</u> , <u>155</u>	Gray, Taylor	<u>52</u> , <u>176</u>	Lobell, Nicole	<u>48</u> , <u>157</u>
Carman, Sophia	<u>39</u> , <u>110</u>	Green, Olivia	<u>52</u> , <u>176</u>	Loch-Test, Sarah	<u>32</u> , <u>68</u>
Carpenter, Garrett	<u>54</u> , <u>192</u>	Greene, Brian	<u>54</u> , <u>193</u>	Lockyer, Rachel	<u>50</u> , <u>168</u>
Carr, Kari	<u>51</u> , <u>170</u>	Griffin, Joshua	<u>47</u> , <u>151</u>	Lovitt, Anthony	<u>54</u> , <u>192</u>
Casteel, Anna	<u>39</u> , <u>108</u>	Hakimi, Javid	<u>35</u> , <u>82</u>	Lowder, Levi	<u>43</u> , <u>134</u>
Chen, Zhan	<u>37</u> , <u>97</u>	Hall, Christina	<u>39</u> , <u>113</u>	Luchetti, Nicholas	<u>37</u> , <u>101</u>
Chilcoat, Kenneth	<u>38</u> , <u>103</u>	Hall, Melissa	<u>52</u> , <u>180</u>	Lynch, Allender	<u>46</u> , <u>145</u>
Chintalapani, Venkatnarsimhareddy	<u>34</u> , <u>78</u>	Hardy, Victoria	<u>40</u> , <u>115</u>	Mahoney, Robert	<u>37</u> , <u>98</u>
Christian, Sarah	<u>47</u> , <u>148</u>	Harrison, Kali	<u>49</u> , <u>161</u>	Malone, Amanda	<u>48</u> , <u>154</u>
Church, Julie	<u>33</u> , <u>72</u>	Harvell, Sarah	<u>32</u> , <u>70</u>	Mannarino, Adam	<u>35</u> , <u>86</u>

Mannino, Joseph	<u>32</u> , <u>69</u>	Radabaugh, Leanne	<u>32</u> , <u>76</u>	Thuor, Erica	<u>51</u> , <u>171</u>
Marquez, Susan	<u>39</u> , <u>110</u>	Ramaswamy, Deepa	<u>49</u> , <u>162</u>	Tobin, Travis	<u>51</u> , <u>175</u>
Martin, Kristen	<u>48</u> , <u>156</u>	Rassau, Jessica	<u>45</u> , <u>144</u>	Torres, Maria	<u>40</u> , <u>118</u>
Martin, Samuel	<u>37</u> , <u>96</u>	Rawcliffe, Hannah	<u>33</u> , <u>71</u>	Tran, Albert	<u>51</u> , <u>172</u>
Martin, Tiesha	<u>41</u> , <u>128</u>	Reese, Lauren	<u>40</u> , <u>117</u>	Trevisan, Adam	<u>37</u> , <u>99</u>
McAuliffe, Joel	<u>52</u> , <u>175</u>	Reid, Andrew	<u>52</u> , <u>181</u>	Trivedi, Mansi	<u>45</u> , <u>144</u>
McCall, Caroline	<u>53</u> , <u>187</u>	Reubens, Michael	<u>31</u>	Trone, Richard	<u>37</u> , <u>96</u>
McDonnell, Jessica	<u>35</u> , <u>83</u>	Rezq, Samar	<u>31</u> , <u>66</u>	Tucker, Ashley	<u>38</u> , <u>107</u>
McFadyen, Barbara	<u>32</u> , <u>80</u>	Richards, Jonathan	<u>45</u> , <u>143</u>	Tucker, Charis	<u>33</u> , <u>72</u>
McGlinn, Marianne	<u>38</u> , <u>105</u>	Riddle, Hannah	<u>34</u> , <u>76</u>	Turner, Kristen	<u>40</u> , <u>117</u>
Mckim, Devin	<u>32</u> , <u>80</u>	Rodgers, Whitney	<u>50</u> , <u>164</u>	Turnis, Brittany	<u>38</u> , <u>105</u>
Mcneil, Kametria	<u>47</u> , <u>152</u>	Rogers, Artie	<u>43</u> , <u>134</u>	Valle Mejia, Kimberly	<u>54</u> , <u>190</u>
McPeek, Matthew	<u>31</u> , <u>62</u>	Ross, Sean	<u>53</u> , <u>183</u>	Vaughan, Thomas	<u>50</u> , <u>168</u>
Mcpherson, Kate	<u>51</u> , <u>174</u>	Rothbart, Alix	<u>49</u> , <u>160</u>	Velte, Ellen	<u>31</u> , <u>64</u>
Meeks, Casey	<u>51</u> , <u>172</u>	Rowell, Christina	<u>34</u> , <u>77</u>	Verkerke, Anthony	<u>40</u> , <u>120</u>
Meyers, Shayna	<u>49</u> , <u>161</u>	Roy, Daren	<u>47</u> , <u>150</u>	Viscomi, Jessica	<u>40</u> , <u>120</u>
Miller, Heather	<u>41</u> , <u>127</u>	Rubio, Hosanna	<u>32</u> , <u>70</u>	Vu, Sohale	<u>39</u> , <u>112</u>
Modzik, Adrian	<u>44</u> , <u>136</u>	Rupe, Trevor	<u>45</u> , <u>142</u>	Vucich, Shannon	<u>47</u> , <u>148</u>
Mooney, Shayna	<u>44</u> , <u>139</u>	Rushing, Amanda	<u>41</u> , <u>125</u>	Waggoner, Stephen	<u>36</u> , <u>92</u>
Moore, Roger	<u>42</u> , <u>131</u>	Rushing, Blake	<u>41</u> , <u>121</u>	Wagner, James	<u>37</u> , <u>98</u>
Moore, Sherri	<u>31</u> , <u>63</u>	Ryan, Terence	<u>43</u> , <u>134</u>	Wall, Angela	<u>42</u> , <u>130</u>
Moore, Tiffanie	<u>35</u> , <u>85</u>	Sager, David	<u>45</u> , <u>144</u>	Ward, Adam	<u>45</u> , <u>142</u>
Moorhead, Paige	<u>47</u> , <u>150</u>	Samir, Sophia	<u>44</u> , <u>138</u>	Warren, Jennifer	<u>36</u> , <u>91</u>
Morad, Samy	<u>43</u> , <u>133</u>	Sana, Anish	<u>34</u> , <u>78</u>	Watts, Amber	<u>32</u> , <u>69</u>
Morgan, Chris	<u>32</u> , <u>70</u>	Sanderlin, Edward	<u>31</u> , <u>65</u>	Webber, John	<u>49</u> , <u>164</u>
Morgan, Melanie	<u>36</u> , <u>90</u>	Sanii, Amir	<u>36</u> , <u>90</u>	Weeks, Anastasia	<u>41</u> , <u>126</u>
Morris, Andrew	<u>30</u> , <u>61</u>	Schachle, Brendan	<u>48</u> , <u>156</u>	Weiss, Kelsey	<u>47</u> , <u>152</u>
Morris, Michaela	<u>49</u> , <u>160</u>	Schmidt, Cameron	<u>31</u> , <u>68</u>	Wells, Andrew	<u>32</u> , <u>80</u>
Moss, Hannah	<u>49</u> , <u>160</u>	Schuster, Daniel	<u>36</u> , <u>89</u>	Westerhold, Lauren	<u>40</u> , <u>116</u>
Moulton, Alex	<u>33</u> , <u>73</u>	Scott, Emmi	<u>33</u> , <u>71</u>	White, Shelby	<u>38</u> , <u>104</u>
Mroz, Robert	<u>38</u> , <u>104</u>	Scurlock, Allen	<u>53</u> , <u>184</u>	White, Timothy	<u>54</u> , <u>193</u>
Murphy, Kayla	<u>35</u> , <u>86</u>	Sellers, Samantha	<u>40</u> , <u>118</u>	Whitley, Cameron	<u>37</u> , <u>99</u>
Muse, Amelia	<u>38</u> , <u>105</u>	Seymore, Kayla	<u>35</u> , <u>83</u>	Whitt, Olivia	<u>38</u> , <u>106</u>
Nagchowdhuri, Partha	<u>41</u> , <u>126</u>	Signorelli, Johnny	<u>33</u> , <u>71</u>	Wiae, Stephanie	<u>47</u> , <u>151</u>
Ness, Kimberly	<u>34</u> , <u>76</u>	Simmons, Cathryn	<u>49</u> , <u>162</u>	Wiles, Allison	<u>47</u> , <u>148</u>
Nguyen, Stephanie	<u>54</u> , <u>191</u>	Simmons, Tierra	<u>36</u> , <u>95</u>	Wilkerson, Kristi	<u>46</u> , <u>146</u>
Nissenbaum, Mark	<u>30</u> , <u>57</u>	Sipe, Sarah	<u>52</u> , <u>180</u>	Williams, Jordan	<u>50</u> , <u>165</u>
Nolan, Casey	<u>30</u> , <u>60</u>	Sledge, Benjamin	<u>45</u> , <u>142</u>	Williams, Oksana	<u>40</u> , <u>119</u>
Novitzky, Katherine	<u>37</u> , <u>101</u>	Smith, Biancas	<u>39</u> , <u>109</u>	Wilson, Jessica	<u>51</u> , <u>172</u>
Olivphant, Kate	<u>34</u> , <u>76</u>	Smith, Christina	<u>49</u> , <u>158</u>	Wilson, Melissa	<u>44</u> , <u>136</u>
Oliveira, Robert	<u>50</u> , <u>169</u>	Smith, Cody	<u>42</u> , <u>130</u>	Wise, Robert	<u>45</u> , <u>143</u>
O'Rorke, Shawna	<u>47</u> , <u>153</u>	Smith, Joshua	<u>51</u> , <u>174</u>	Workman, Jason	<u>47</u> , <u>152</u>
Osho, Matilene	<u>35</u> , <u>82</u>	Smith, Justin	<u>47</u> , <u>150</u>	Worthington, Natasha	<u>41</u> , <u>128</u>
Outlaw, Nolan	<u>37</u> , <u>100</u>	Smith, Mary	<u>50</u> , <u>166</u>	Wright, Diana	<u>31</u> , <u>63</u>
Owens, Ashley	<u>53</u> , <u>189</u>	Smith, Michael	<u>38</u> , <u>106</u>	Wygand, Madelon	<u>53</u> , <u>184</u>
Owers, James	<u>37</u> , <u>98</u>	Smith, Nancy	<u>54</u> , <u>192</u>	Xiong, Sheng	<u>50</u> , <u>165</u>
Palmer, Autumn	<u>39</u> , <u>110</u>	Snipes, Tayler	<u>53</u> , <u>188</u>	Yan, Huimin	<u>43</u> , <u>135</u>
Park, Sanghee	<u>41</u> , <u>123</u>	Soliman, Eman	<u>43</u> , <u>133</u>	Yao, Fanrong	<u>43</u> , <u>132</u>
Parker, Grayson	<u>51</u> , <u>173</u>	Sotolongo, Emilia	<u>41</u> , <u>127</u>	Yllanes, Alexander	<u>41</u> , <u>124</u>
Parker, Kathryn	<u>39</u> , <u>114</u>	Sparks, Courtney	<u>33</u> , <u>72</u>	Yoon, JiHyung	<u>31</u> , <u>66</u>
Parker, Stephen	<u>51</u> , <u>170</u>	Stevens, Luke	<u>38</u> , <u>103</u>	Younge, Erin	<u>32</u> , <u>81</u>
Parris, James	<u>50</u> , <u>167</u>	Strickland, Chloe	<u>48</u> , <u>155</u>	Zenil, Hilde	<u>30</u> , <u>58</u>
Patel, Aayushi	<u>52</u> , <u>176</u>	Stroman, Crystal	<u>39</u> , <u>112</u>	Zhu, Yi	<u>31</u> , <u>67</u>
Patel, Krishna	<u>52</u> , <u>181</u>	Sullivan, Elizabeth	<u>41</u> , <u>126</u>	Zou, Kai	<u>43</u> , <u>132</u>
Patrick, Annie	<u>34</u> , <u>79</u>	Sykes, Sarah	<u>39</u> , <u>113</u>	Zuercher, Christine	<u>32</u> , <u>70</u>
Patrick, Dru	<u>32</u> , <u>68</u>	Tahira, Adeem	<u>52</u> , <u>177</u>		
Pelletier, Christopher	<u>37</u> , <u>100</u>	Tapp, Susan	<u>39</u> , <u>114</u>		
Pike, Michelle	<u>54</u> , <u>191</u>	Taylor, Lea	<u>53</u> , <u>186</u>		
Poole, Skylar	<u>48</u> , <u>156</u>	Tebehaevu, Ogaga	<u>35</u> , <u>85</u>		
Porter, Taylor	<u>35</u> , <u>85</u>	Temple, Cody	<u>52</u> , <u>178</u>		
Preib, Madison	<u>36</u> , <u>88</u>	Thet, Zayer	<u>44</u> , <u>137</u>		
Prevatte, Jonathan	<u>37</u> , <u>97</u>	Thigpen, Joshua	<u>30</u> , <u>56</u>		
Price, Vaughn	<u>36</u> , <u>94</u>	Thigpen, Tiffany	<u>36</u> , <u>89</u>		
Pridgen, Katie	<u>49</u> , <u>163</u>	Thomas, Jacob	<u>50</u> , <u>166</u>		
Prunka, Michael	<u>48</u> , <u>156</u>	Thomas, Katherine	<u>39</u> , <u>111</u>		



RESEARCH CREATIVE ACHIEVEMENT WEEK

The word "RESEARCH" is in large, bold, purple outlined letters. The word "CREATIVE" is in purple outlined letters. The word "ACHIEVEMENT WEEK" is in purple outlined letters. A pink ribbon graphic is positioned between "RESEARCH" and "CREATIVE".

Thank You

Thank you for your interest in East Carolina University's Research & Creative Achievement Week of 2015.

The RCAW Committee would like to thank all of those who participated and attended.

We look forward to see you all again next year in 2016.

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