



Volume 3,
Issue 4

April 2015

*What's going on in
the North Carolina
Academy of Science:*

- Annual Meeting Reflections
- Bryden and Derieux Award Winners
- Featured Scientist—Dr. Daniel Stovall
- NCAS in the News!
- Photos from the Annual Meeting

***Inside this
issue:***

Meeting Reflections	1-2
Photos	3
Thank you to our Sponsors	4
NCAS in the News	5
Bryden & Derieux Winners	5-6
Featured Scientist	7

Reflections on the NCAS Annual Meeting

Report by: Dr. Claire L. Gordy Goller, University of North Carolina at Chapel Hill, and Dr. Carlos Goller, NC State University

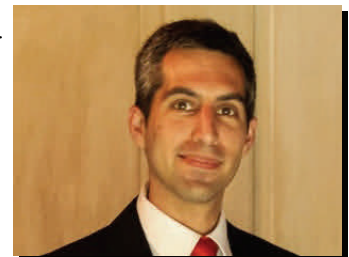
The theme of the annual meeting of the North Carolina Academy of Sciences (NCAS) was “innovation in research”. The unique architecture of Wake Forest Biotech Place, located in the Innovation Quarter of Winston-Salem, provided a sunlit atrium for the meeting. Surrounded by modern laboratories with glass windows facing the open hallways and atrium, this venue symbolized the new era of science, where the public can peer into the world of scientists, and scientists have the opportunity to engage the public.

The atrium gradually filled with students, mentors, scientists, and teachers from all over North Carolina, and the poster session was bustling with activity. For us this was an opportunity to learn about the exciting undergraduate research taking place across the state. In a single row of posters, you could learn about fire ant ecology and cancer biology! We were most impressed with the creativity from both students and mentors conducting truly innovative research with often limited time and resources.

The Saturday morning oral sessions showed us the energy these young scientists are applying to better understand the world around us! We heard talks about salamanders, tomato plants, bacteria, and the epigenetic effects of nicotine. One after another, the students presented with admirable confidence. Their ownership of their projects was clearly reflected in their mastery of scientific concepts and their ability to realize the limitations of their work and propose future studies. Learning by doing, discovering how the world works, and explaining findings to others who may not be familiar with the topic are important outcomes of productive undergraduate research experiences. These students demonstrated that their mental models of the world were created through true experimentation, showing that they had engaged in meaningful learning.

The afternoon workshops continued the weekend’s focus on innovation by providing students and faculty with opportunities for hands-on learning and problem solving sessions on a variety of topics, from commercializing research to engaging the public through science fiction to creating apps to benefit students with disabilities.

As the meeting came to an end and we traveled home, we discussed how NCAS provides us with something that larger discipline-specific meetings don’t – the ability to interact with researchers at all stages of their careers and make meaningful connections with scientists in many other fields. This cross-disciplinary discussion and learning is not just an enjoyable break from our normal focus on our own research topics, but an exercise that is critical for the “innovation in research” that NCAS strives to support.



Dr. Claire Gordy Goller and Dr. Carlos Goller

Overview of the NCAS 2015 Annual Meeting

Report by: Dr. Allyn Howlett, Local Arrangements Committee Chair, Wake Forest School of Medicine



Photo credits: Local Arrangements Committee Chair, Wake Forest School of Medicine

The 2015 Annual Meeting of the NCAS was held March 27-28 in Wake Forest Biotech Place, hosted by Wake Forest University Graduate School, Wake Forest School of Medicine and Wake Forest Innovations. As a community effort, the local arrangements committee also included faculty from Winston-Salem State University and Salem College. This year, the WFU Postdoctoral Association Teaching Affinity Group assisted with judging student posters and talks, as well as moderating special sessions. Additional sponsors supporting the meeting included LabCorp, North Carolina Biotechnology Center, Wake Forest Innovation Quarter, Cook Medical, Carolina Biomedical, Burroughs Welcome Fund and RTI International, as

well as the many vendors who set up tables to show their wares.

The theme for the meeting 'Innovation in Research' was exemplified by the plenary lecture from Christian Felder of Eli Lilly & Co. He explained that because of the exorbitant cost of drug development and high failure rates along the process of taking a compound through the pipeline to market, pharmaceutical companies need to make drugs in a smarter way by collaborating with academic laboratories. Also exemplifying Innovation in Research, keynote speaker Jennifer Elisseff from Johns Hopkins University provided insights into regenerative medicine therapeutics, using examples of how biomedical engineering can provide solutions for wound healing and tissue replacement in medical practice. Special session topics highlighted the local research enterprise, including biotechnology work-

force development led by the National Center for the Biotechnology Workforce at Forsyth Technical Community College; inspirational collaborations between computer science and the arts at the UNC Center for Design Innovation; biotechnology strategies to feed the world's population by Syngenta; and the engineering impact of nanotechnology on energy, therapeutics and lifestyle from the WFU Nanotechnology Center. Workshops demonstrated local academic researchers who have commercialized their discoveries or developed their own companies based upon their scholarly activities in fields such as neuroscience, computer science, chemistry, ecology, and law. Researchers from across North Carolina explained their scientific endeavors in 56 poster and 40 oral presentations.

Annual Meeting Photos

Photo Credit to: Matt Clark, Elon University & Andy Steele, Lenoir-Rhyne University



Thank You to Our Sponsors!

Diamond Sponsors



Platinum Sponsors



Gold Sponsors



Silver Sponsors



Bronze Sponsors



What Can NASS do for NCAS?

Report by: Dr. Steve Warshaw, North Carolina School of Science and Math

I have the honor of being elected President-Elect of the National Association of Academic of Science (NAAS). But I want it to be more than an honor. There are probably more ways that NAAS can support the state Academies, which is a primary part of its mission. Right now NAAS support consists mainly of a Newsletter. What else could we be doing to grow and strengthen the Academies? Please send me your suggestions at warshaw@ncssm.edu. Thanks!

NCAS in the News

Report by: Dr. Beth Overman, NC State University

At last year's Annual Meeting at the North Carolina Museum of Natural Sciences, students and faculty flocked to a demonstration of an unpowered exoskeleton designed by researchers at NC State University. The exoskeleton, which fits on the outside of the lower leg, is used to increase walking efficiency in adults. Dr. Gregory Sawicki, a biomedical engineer and one of the principle investigators on this project, has been making headlines in the past month with his work. In conjunction with researchers at Carnegie Mellon, Dr. Sawicki's work was published in Nature earlier this month! The article, entitled

"Reducing the energy cost of human walking using a unpowered exoskeleton", has been shared on many science outlets and social media, including [Science News](#) and [Nagg](#).

This is more evidence of the fantastic research occurring in North Carolina, and being presented at our annual meeting.

For more information about Dr. Sawicki's work, see [this article and video](#) shared through NC State's News Bulletin.

Do you have exciting news to share to the NCAS Family? Let the publication committee know, and we can highlight your news!

guzman@campbell.edu
jessicarosemccann@gmail.com
Beth_overman@ncsu.edu
dstovall@ncwc.edu

The NC Academy of Science would like to thank our Institutional Members:

Methodist University

Elon University

Campbell University

UNC at Greensboro

Lenoir-Rhyne University

UNC at Pembroke

Warren Wilson College

We appreciate your support!

Bryden Awards

Report by: Dr. Lei Zhang and Dr. Mark McCallum

Lei Zhang, Chair of the Bryden Grants Committee, reports that the committee received 8 high quality applicants for this year's Bryden Grants Award. The committee carefully reviewed and scored all of the projects based on an evaluation rubric and selected the winner.

Bryden Award Winner: **Angela Larsen, UNC Greensboro** (Advisor: Dr. Matina Kalcounis-Rueppel) for her project entitled "*How Does Behavior Drive Population and Community Dynamics of Rodents*". The grant award was for \$1,000.

Bryden Award Honorable Mention: **Amanda Liss, UNC Greensboro** (Advisor: Dr. Parke Rublee) was also recognized as an official Honorable Mention for her project entitled "*Quantification of A Potent Neurotoxin in Piedmont NC Reservoirs*".

Congratulations to Angela and Amanda on this honor!

CANCAS Derieux Award Winners

Report by: Dr. Michele Malotky, Guilford College

Poster Presentation Awards

Zoology, Ecology and Environmental Science

1. SEAN TAYLOR, Mary Jane Carmichael, Joseph White, William Smith, *Wake Forest University*. Effect of increased salinity exposure on leaf tissue and water status in *Taxodium distichum* (Bald Cypress) seedlings
- 2 (tie). MYCAH SEWELL, Haylee A. Trotter, and Lisa Kelly, *University of North Carolina at Pembroke, NC*. Colony Social Forms of Invasive Fire Ants (*Solenopsis invicta*) in Wetlands of North Carolina
- 2 (tie). ANGELA LENARD, Amanda Williard, *University of North Carolina, Wilmington*. The Effect of Water Temperature on Lactate Accumulation in Exercising Yellow-bellied Slider Turtles (*Trachemys scripta*)
- 3 (tie). ASHLEY MCKENZIE, *University Of North Carolina Wilmington*. Stable isotope and mercury analysis of Adélie Penguin tissues from Antarctica
- 3 (tie). BENJAMIN S. HUMPHREY & David Campbell, *Gardner-Webb University*. A Survey of Phylum Mollusca in the Broad River Greenway, Boiling Springs, N.C.

Biotechnology, Chemistry, Physics & Engineering, Genetics & Genomics

1. MORGAN PACKER, Nathan Reed, Taek You, Greg Buhrman, and Robert Rose, *Campbell University & North Carolina State University*. Binding Studies of Human Insulin Transcription Factors Pdx1 and MafA on the Promoter
- 2.(tie) ISMAEL GOMEZ, C. Kabryn Mattison, David A. Beamer, *Nash Community College*. The Distribution of mtDNA Haplotypes Associated With An Ancient Hybridization Event
2. (tie) STEPHEN AMOAH, Justin Schwartz, *Lenoir-Rhyne University and North Carolina State University*. Electrical Processing Of Thoria Pellets
3. JULIANO SLIVINSKI, Tyler Graf, Nicholas H. Oberlies. *The University of North Carolina at Greensboro*. Isolation and Purification of Compounds from *Silybum marianum*

Behavioral & Health Sciences, Cell Development

1. ADELE PRICE and Michele Malotky, *Guilford College*. Development of a pathogenic assay to test potential novel antibiotics in *Caenorhabditis elegans*
2. (tie) MORGAN PAIT, Lyndsie Elliott, Sarah Ruiz, Heather Romine, JodiAnne Wood, Alexandros Makriyannis, and Ben A. Bahr1, *University of North Carolina, Pembroke*. Further Development of Z-Phe-Ala-diazomethylketone (PADK) for Alzheimer's Disease: Oral Dosing Increases Active Cathepsin B in Brain without Causing Adverse Effects
2. (tie) JUSTIN BRANCH and Ben A. Bahr, *University of North Carolina Pembroke*. Testing whether the Lysosomal Modulator PADK is involved in the Lysosome-to-Nucleus pathway that promotes longevity
3. KAYLA GUDAC, Hali Calcutt, Dr. Stephannie Walker, *University of Mount Olive*. The Impact of Classroom Behavior on Academic Performance

Immunology, Microbiology & Molecular Biology

1. SARA McEWAN, Heather Romine, Vidyanand G. Shukla, Spyridon P. Nikas, Alexandros Makriyannis, and Ben A. Bahr, Laboratory, *University of North Carolina, Pembroke*. Testing endocannabinoid enhancement for protection against paraoxon-induced oxidative damage and corresponding synaptic decline in rats
2. (tie) ANNAPURNA HANUMANTHU and Mary Beth Hawkins, *NC State University*. Mutation of a single ligand binding domain amino acid of the teleost estrogen receptor Beta a increases its binding affi-

CANCAS Derieux Award Winners

Report by: Dr. Michele Malotky, Guilford College

ity to DES

2. (tie) **AUTUMN BASS**, David Guzman, Karen Guzman, *Campbell University*. A Simplified Method to Create Transgenic Zebrafish using Electroporation
3. **CARY MUNDELL**, Aaron Byrd, Sarah N Campion, Amy Bataille, Jose E. Manautou, Ben A Bahr, *University of North Carolina, Pembroke*. Analysis of GST Specific Activity in Aged Mice Treated with PADK

Oral Presentation Awards

Immunology, Microbiology, Cell Development and Chemistry

1. **ALAN-MICHAEL BRESCH**, *Lenoir-Rhyne University*. The Effect of Titanium dioxide on Phagocytosis, Exocytosis, and Contractile Vacuole Function of *Tetrahymena thermophila*
2. **BRITTANY COURSEN**, *Lenoir-Rhyne University*. The effect of sodium dodecyl sulfate (SDS) on the regenerative properties found in *Lumbriculus variegatus* (California blackworms)
3. (tie) **BRIAN LIECHTI**, Laura Lengnick, Jeff Holmes and John Brock, *Warren Wilson College*. The effect of cattle grazing on soil carbon evolution.
3. (tie) **MARK HEALEY**, Elizabeth D. Blue, *Campbell University*. Exploring the Role of N-methylimidazole in the Mechanism of Copper(I)/TEMPO-Catalyzed Aerobic Oxidation of Primary Alcohols

Genetics and Molecular Biology

1. **LAUREN M. DOOLITTLE** and Gloria K. Muday, *Wake Forest University*. Elucidating the ARF7 transcription factor network that controls lateral root formation in Arabidopsis
2. **MARCUS SHERMAN** and Conner I. Sandefur, *UNC-Pembroke*. Differential genomic profiling of *Solenopsis invicta* Buren subtypes via gene counter-regulation and functional annotation
3. (tie) **C. KABRYN MATTISON** and David A. Beamer, *Nash Community College*. Past, Present, Future: Hybridization Between Two Dusky Salamander Lineages
3. (tie) **KATHLEEN T. DINAPOLI**, Gregory S. Maloney, Gloria K. Muday, *Wake Forest University*. Tomato mutants and introgression lines provide evidence for a role of flavonoids in lateral root development

Ecology

1. **BENJAMIN S. ROBB**, *Wake Forest University*. Effects of Fungal Endophyte on Antagonistic Modulation of SA and JA Pathways
2. **JIMMIE TEAGUE**, Gideon Wasserberg, *University North Carolina at Greensboro*. The Oviposition of *Aedes albopictus* in Response to Copepoda in Field Conditions
3. **PAUL FRYE** and Constance Lowery, *Catawba College*. The Effects of Increased Levels of CO₂ on Photosynthesis and Respiration of *Favia fragum*

Health and Behavioral Science

1. **DEANNA MOQUIN** and Michele Malotky, *Guilford College*. Wise worms: Effects of Ginkgo biloba on learning and memory in *Caenorhabditis elegans*
2. **SAM ANDERSON**, *Lenoir-Rhyne University*. Muscle Fatigue: its effect on force and motor unit recruitment in forearm muscles
3. **MARIE MAUHAR**, *Lenoir-Rhyne University*. Differences in Anatomical Proportions of Collegiate Athletes

Featured Researcher: Dr. Daniel Stovall

Report by: Dr. Beth Overman, NC State University

It's an exciting time to be a part of the North Carolina Academy of Science—we are experiencing a time of growth, as new undergraduate researchers, graduate student researchers, faculty, and institutions join our ranks. We are excited to highlight one of our newest academy members, Dr. Daniel Stovall, as our featured researcher for this issue!

Dr. Stovall is currently an Assistant Professor at North Carolina Wesleyan College. After graduating from Campbell University with a BS in Biology, he went on to complete his PhD in Cancer Biology from Wake Forest University, studying disrupted epigenetic regulation of tumor suppressor genes in cancer progression. Though Dr. Stovall is new to the senior Academy, he is very familiar with NCAS—as a student at Campbell, he was a part of the Collegiate Academy (CANCAS) and attended one of our annual meetings. At Wesleyan, he teaches a variety of life science courses, including Anatomy and Physiology, Histology, Developmental Biology, and Physiology. He is passionate about teaching and involving undergraduate students in research.



Currently, Dr. Stovall is working with two undergraduate research students in the lab. Together, they are investigating the role of SOX17 in prostate cancer, studying the protein's potential as a tumor suppressor gene. Working in the lab in this inquiry-based manner, Dr. Stovall says, is his favorite part of mentoring undergraduates. "I like that they're early in their scientific career. They are just discovering that feeling of being the first person in the world to learn the answer to a question. At any level, that is a great sensation; but, as an undergraduate, it is a uniquely special experience," he reflects. In these mentoring relationships, Dr. Stovall is careful that the students are active participants in each part of the research process, from reading the literature, to designing the research question, to finally designing the process to answer the question.

When asked what his goals are for the future, Dan's response is straightforward: "I want to continue developing undergraduate research projects that enable them to become critical, scientific thinkers." He is taking great steps to provide students with mentorship and training in undergraduate research.

Job Openings in the Scientific Community

For more information on how to apply, go to <http://www.ncacadsci.org/NCAS/jobOpportunities.html>

1. Principal Scientist - Immunology, Heat Biologics, Durham NC

Heat Biologics (www.heatbio.com) is a clinical-stage immunotherapy company focused on utilizing its proprietary ImPACT (Immune Pan-Antigen Cytotoxic Therapy) technology to develop novel, off-the-shelf live-cell vaccines that modulate the immune system to treat a range of cancers.

2. Clinical Research Scientist, AbilTo, NYC

AbilTo is a venture capital-backed, high growth technology-enabled healthcare company. We are seeking a talented and experienced professional to advance AbilTo's research initiatives, transforming our vast clinical data into knowledge that can advance innovation and improve health and that be shared through peer-reviewed publications, abstracts, and presentations.

3. Eastern Regional Sales Manager, Global Recruiters of Frankfort, Boston, New York, Philadelphia or Baltimore/Washington DC

The primary role of the Regional Sales Manager is to manage, drive and support business from a select list of distributor and academic research accounts. This position is ideal for someone looking to progress from academia and start a commercial career while maintaining an interest in science and imaging, or someone in a sales or application specialist position looking to for a new challenge and to grow his or her skill set.

4. Senior Science Officer - Psychological Health, Ripple Effect Communications, Fort Detrick MD

The Congressionally Directed Medical Research Program within the Department of Defense funds biomedical research in response to the expressed needs of its stakeholders - Congress, the American public and the military.

5. Science Officer, International Council for Science, Paris France

The International Council for Science (ICSU) is seeking a Science Officer to assist with the planning and implementation of ICSU's initiatives. ICSU is a non-governmental scientific organization with a global membership. ICSU members include 121 national scientific bodies (mostly national academies of science), 31 International Scientific Unions, and 23 International Scientific Associates. Activities focus on three areas: International Research Collaboration, Science for Policy, Universality of Science.

NCAS Annual Meeting 2015 on Twitter!

Want to see the Annual Meeting through the eyes of twitter? We've created a storify story for our 2015 Annual Meeting, following our hashtag #2015NCAS! To see the story, [visit this link](#). Enjoy—and join us on Twitter for more conversations next year!



The North Carolina Academy of Science
Meredith College Department of Biological Sciences, 3800 Hillsborough St., Raleigh, NC 27606-5298

Phone: 919-760-8189
Fax: 919-788-0956
ncacadsci@email.meredith.edu

“Like” us on Facebook and follow us on Twitter (@NCAcadofSci) to get the latest updates and information on what’s happening at your North Carolina Academy of Science!



Check us out on the web!
<http://www.ncacadsci.org/home.html>

The **objective** of the North Carolina Academy of Science is to *encourage the advancement of science within the state of North Carolina by promotion of scientific research and by the fostering of education in the sciences*". The North Carolina Academy of Science meets these objectives by...

- Publishing a peer reviewed scholarly journal, the *Journal of the North Carolina Academy of Science*.
- Fostering and encouraging student involvement in the sciences through support of the Collegiate (CANCAS) and Student Academies (NCSAS).
- Promoting interactions among scientists and students throughout North Carolina.
- Providing a forum for exchange of ideas for solving issues important to North Carolina.

The Academy members include individuals from academia, industry, government, and all others who support the objectives and goals of the Academy.

North Carolina Academy of Science

Our Mission

The North Carolina Academy of Science promotes public appreciation of science, science education, scientific research and a meaningful role for science in public policy.

Our Goals:

Promote public appreciation of science

- Partnership with Science Centers
- Public Lecture Series
- Newsletter

Promote science education

- NCAS Webpage
- Academic Lecture Series
- NCAS Publications: Journal, Educational Publications
- Student Academy - Middle & High School

Promote scientific research

- Yarbrough and Bryden Research Grants
- CANCAS Undergraduate Research Workshop
- Presentation Opportunities at Annual Meetings

- Journal of the North Carolina Academy of Science

Promote science in public policy

- Symposia
- News Releases
- Position Statements
- Interactions with Public Officials

