



THE TRIANGLE TRANSMITTER

First Annual Spring Meeting: Note from the President

Friends and colleagues,

I am very pleased to share that our first annual Neuroscience Day, held on April 10th at the Research Triangle Park Headquarters, far exceeded our expectations. More than 150 neuroscientists from around the region attended the meeting, with 41 individuals presenting posters from local universities and research institutes and 8 of our generous sponsors hosting exhibits. Our local speakers from the University of North Carolina at Chapel Hill, Duke University, and Wake Forest University, as well as our keynote speaker from the University of Texas, were exceptional and enthusiastically received. We were also thrilled to have so many budding young neuroscientists among us!

Our first annual meeting reflects the vision we had one year ago, when we reinstated our chapter. This is a community with remarkable universities, research institutes, and biotechnology companies. The Triangle is a great hub for neuroscience research – April 10th was a testament to that!

I would like to thank all who participated in this event, especially our poster presenters and our sponsors. We have already fervently begun planning our next event – and we hope you will join us again next Spring!

*Amir H. Rezvani, Ph.D.
Triangle SfN President*

MAY 2015

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New Neuroscience Minor at the University of North Carolina at Chapel Hill!

Beginning Fall 2015, UNC-CH will be offering courses to fulfill an undergraduate minor in neuroscience. The minor, which will be housed in the Department of Psychology, began as a grassroots movement led by undergraduate students in the Carolina

Neuroscience Club. The development of this minor reflects a growing interest in the brain, and is an exciting opportunity for students who are keen to learn about neuroscience research taking place in the Triangle and beyond.

-Marsha Penner, UNC-CH

Dr. Adron Harris Educates and Entertains as Keynote Speaker

The Triangle SfN committee had the distinct pleasure of hosting Dr. Adron Harris for our first Spring Neuroscience Meeting. Dr. Adron Harris holds the M. June and J. Virgil Waggoner Chair in Molecular Biology and is Director of the Waggoner Center for Alcohol and Addiction Research, University of Texas (Austin), where he directs a research program on the molecular actions of drugs of abuse on brain signaling systems.

The breadth of Dr. Harris' research accomplishments is astounding! Having trained as a pharmacologist, he directs a multidisciplinary team focused on defining acute and long-term actions of alcohol and other drugs. He specializes in the study of the neurochemical basis for genetic differences in drug response and uses genetically-modified mice that vary in susceptibility to drug intoxication and dependence. He also investigates the structure and function of ion channels with emphasis on the molecular mechanisms responsible for alcohol and drug actions and the regulation of brain gene expression by drugs. Dr. Harris has published 68 peer-reviewed publications in the last 5 years (423 career total) and has almost 16000 non-self-citations in total (Web of Science). These statistics place his work in the top 1% in the field of Neuroscience and Behavior, 1997-2007.

I have mainly followed Dr. Harris's work on alcohol and the neuroimmune system, but his talk "Alcohol and the Brain: From Binding Sites to Gene Expression" was a great reminder of the multi-faceted nature of great research programs. He spoke both about his work as it relates to understanding alcohol pharmacology and about genetic contributions that may predispose individuals to abuse patterns. I was impressed by the level of adaptability over his career and his continued investment in being at



*Keynote Speaker Dr. Adron Harris and Triangle SfN President Dr. Amir Rezvani at the First Annual Triangle SfN Spring Meeting
(Photo courtesy of Leah Townsend)*

the cutting edge of techniques to further elucidate the neurobiological effects of drugs of abuse. It was inspiring, as a trainee, to learn from someone who's SfN membership number is only 3-digits long (just for reference, my number is 9-digits!) and to witness his continued passion for both his personal research and policies concerning science training.

Next year's keynote speaker has big shoes to fill!

-- Alex Marshall, UNC-CH

Are you Interested in writing for the Triangle Transmitter or helping develop content for our new website?

If so, the Communications Committee would love to hear from you!

Please email trianglesfnnews@gmail.com for more information!

Local Neuroscientists Shine at First Annual Spring Neuroscience Meeting

The Triangle SfN meeting was kicked off by three excellent talks from local speakers: two from our chapter and one from the neighboring Western NC Chapter.

The first speaker was Dr. Gina Carelli from the University of North Carolina at Chapel Hill. Dr. Carelli is in the Department of Psychology, where she is the Stephen B. Baxter Distinguished Professor & Associate Chair. She earned her undergraduate and graduate degrees in Psychology from Rutgers University, and ventured south to pursue postdoctoral training with Dr. Sam Deadwyler at Wake Forest University. She stayed in North Carolina for her first faculty position, at UNC, where she has risen from Assistant Professor to her present rank. She was awarded a Presidential Early Career Award for Scientists and Engineers in 2001.

Dr. Carelli's laboratory investigates how information about both natural and drug rewards is processed in the brain and used to guide actions. In her talk to the chapter, she discussed recent work focused on teasing apart the neural circuitry underlying choices between rewards of differing values, using cutting-edge optogenetic tools. Her findings emphasize the important role of the nucleus accumbens in such choices, and further suggest that the core and shell subdivisions each play distinct roles specific to reward disparity type.

The second talk was from recent Triangle transplant Dr. Steve Lisberger of Duke University. Dr. Lisberger is the George Barth Geller Professor and Chair of the Department of Neurobiology as well as an Investigator with the Howard Hughes Medical Institute. Dr. Lisberger studied mathematics as an undergraduate at Cornell University; he turned to neuroscience in

graduate school, where he began investigating the role of the cerebellum in controlling eye movements at the University of Washington with Dr. Ed Fuchs. He completed his postdoctoral training at the NIH and accepted his first faculty position at the University of California, San Francisco in 1981, where he rose from Assistant to Full Professor and was the founding director of the W.M. Keck Foundation Center for Integrative Neurosciences.

Dr. Lisberger began his current position at Duke in 2012. He was elected to the American Academy of Arts and Sciences, and has received both the Young Investigator Award and the Outstanding Mentoring Award from the Society for Neuroscience. In his talk, Dr. Lisberger discussed recent work from his lab investigating the mechanisms of motor learning by "listening to the cerebellum while it works." His findings identify sites of synaptic plasticity in the cerebellum that underlie learned control of eye movements. Moreover, these findings provide insights into the neural bases of motor skill learning.

The final local speaker talk was given by Dr. Emilio Salinas of the Wake Forest School of Medicine. Dr. Salinas is an Associate Professor and Graduate Program Director in the Department of Neurobiology and Anatomy. He received his undergraduate degree in Physics from the Universidad Nacional Autónoma de México (UNAM), followed by a PhD in Biophysics at Brandeis University, where he worked with computational neuroscientist Larry Abbott. He returned to UMAN for postdoctoral training in electrophysiology under Dr. Ranulfo Romo, followed by postdoctoral research at the Salk Institute. Dr. Salinas accepted his first faculty position at Wake Forest, where he has

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risen from Assistant to Associate Professor.

Dr. Salinas uses a combination of physiological and computational methods to explain the dynamical properties of spiking networks, how neurons represent and transform sensory information, and how information is integrated in the brain to guide behavior. His talk focused on recent studies of signals in the frontal cortex associated with rapid perceptual decision-making. His findings

show how reward and perceptual information can interact to modulate the speed of decision-making and provide insights into the mechanisms of motor planning. This was a particularly apt final talk in that it explicitly tied together the reward and motor systems highlighted in the two prior talks.

Taken together, the local speaker talks were well attended and each elicited a lively question and answer period.

-Charlotte Boettiger, UNC-CH

Travel Award Winners: Annual Spring Neuroscience Meeting

Undergraduate/Graduate Student

Leslie Wilson: *Highly selective and mechanically robust sensors for electrochemical measurements of real-time hydrogen peroxide dynamics in brain tissue* (LR Wilson, AC Schmidt, and LA Sombers; NC State University)

Kelly Carstens: *Perineuronal nets regulate functional plasticity in hippocampal area CA2* (K Carstens, R Weinberg, and S Dudek; UNC-CH and NIEHS)

Chris Foster: *Age effects on hippocampal functional connectivity during multifeatured encoding* (C Foster, M Picklesimer, N Mulligan, and KS Giovanello; UNC-CH)

Leah Townsend: *Stimulus-driven circuit dysfunction in the visual cortex in a mouse model of Angelman syndrome* (LB Townsend, KA. Jones, IT Smith, BD Philpot, and SL Smith; UNC-CH)

Postdoctoral Fellows

Georgia Alexander: *Firing properties and immediate early gene mapping in hippocampal area CA2* (GM Alexander, S Farris, J. Pirone, and SM Dudek; NIEHS)

Ryan Bell: *Investigation of functional connectivity in executive function resting state networks in cocaine dependent individuals* (RP Bell, TJ Ross, EA Stein, and SB Daughters; UNC-CH)

Thank you to our generous travel award sponsors!

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Neuroscientist Spotlight: Triangle SmartTalk Teaches You to Think Outside the Box

How do machines learn, movies get made, and economists study the environment? We can learn the answers to these questions and more with Triangle SmartTalk.

These days, you can train your brain to pay attention, remember things, and even be happier... but can you train your brain to think outside the box? Bin Yin, soon-to-be Ph.D. in the Psychology and Neuroscience at Duke University, says you can. And he's started Triangle SmartTalk to teach you how.

Imagine a TED talk – only instead of just a broad introduction to an interesting idea, you learn the key terms and concepts that enable you to talk to specialists in the area and create a foundation for learning more on your own time. Now imagine that you get to personally work with the researchers and professionals who work on this issue to develop that story. That is what Triangle SmartTalk is all about – team-based knowledge-sharing to expand your world.

For Bin, such team-based knowledge-sharing is essential for creative thinking. “Just listening to a lecture isn't enough,” Bin said in an interview. “You have to go through the learning process – only then can you think about things in different ways.”

This learning process is central to Triangle SmartTalk's mission. Each 40 minute talk is presented by only one or two people but is created by an interdisciplinary team of four or five. Prior to the talk, the team meets to discuss the topic, share what they know, and learn from each other how best to introduce the topic to a general audience. The talk is then presented to an auditorium of interested students, postdocs, professionals, and members of the Triangle community. Everyone is encouraged to ask questions. Throughout the process, mutual learning is the primary focus.

“Sometimes the questions can be naïve, but you need that to get out of your framework,” said Bin.

While learning how to think in different ways is a primary aim of Triangle SmartTalk, there are other benefits to going to or helping produce one of these talks. “This process helps you build confidence,” Bin said. “You're not afraid to talk to new people because you know interesting stuff.”

A key component to broadening horizons is by gaining insight from a diverse group of people. As such, Triangle SmartTalk is always looking for new participants. “I really want people who are interested in it to contact us,” Bin urged. “Get involved, and see what it's about. We can figure out together how to proceed.”

-Ted Stanek, Duke University

If you are interested in learning more about Triangle SmartTalk and are a Duke affiliate, please add your email to the list-serve trianglesmarttalk@duke.edu. Non-Duke affiliates can contact Bin at trianglesmarttalk@gmail.com.



Bin Yin and his team at Triangle SmartTalk focus on team-based knowledge sharing.

Photo courtesy of Bin Yin, Duke University

Brain Tricks: Sensation and Perception During Brain Awareness Week

Can you always believe your eyes? How about senses of sound, touch and smell?

For Brain Awareness Week, the University of North Carolina at Chapel Hill Bowles Center for Alcohol Studies sponsored the interactive exhibit “Brain Tricks – Sensation and Perception” at the North Carolina Museum of Life and Science (<http://www.ncmls.org/>) in a hands-on laboratory exhibit.

Visitors entered the lab area and first explored the human brain by observing and touching not only a postmortem human brain but also sheep, dog shark, and rodent brains. Scientists talked with visitors about brain function and which parts of the brain control various senses.

At the second station, scientists showed visitors one way that the brain can trick our senses. In the McGurk effect, what we see (lip-reading) overrides what we hear (the sounds “Baa,” “Daa” or “Vaa”). This is a robust illusion that works even when you know what is going on!

The third station used scented balloons to illustrate a Stroop-like effect – it is easier to identify an odor (cherry, lemon) when it is presented in a balloon of a congruent color (red, yellow) than if the color does not match the odor.

We also had examples of optical illusions and some tactile illusions (e.g., the “Aristotle illusion” and the “dead hand trick”). The exhibit was staffed by more than 40 scientists and students from UNC and Duke University, including several members of the Triangle SfN Chapter.

Approximately 550 children and 200 adults visited the exhibit over 5 days! When asked their favorite activity, children answered

“[the] brain, because it’s squishy and fun,” “I [heart] everything! The balloons smell so good!” and “I was quite fond of the auditory illusion.” When asked what they learned, one child answered “your brain expects the obvious.”

-Donita Robinson and Joyce Besheer, UNC-CH

Funded provided by the Education Core of the UNC Alcohol Research Center (National Institute of Alcohol Abuse and Alcoholism, P60AA011605, “Molecular and Cellular Pathogenesis in Alcoholism: Education Core”, PI: Fulton T. Crews)



Over 700 visitors participated in the Brain Tricks exhibit hosted by the UNC Bowles Center for Alcohol studies during Brain Awareness Week.

Photos courtesy of Donita Robinson, UNC-CH

Distinguished Neuroscientist Wows Crowd at Raleigh Brain Awareness Week Event

There was standing room only for Dr. Baldomero 'Toto' Olivera's Science Café on March 13, 2015, which was held at the North Carolina Museum of Natural Sciences in Raleigh.

Guests of all ages were in attendance to celebrate the 50th year of Brain Awareness Week. During this annual week-long event, neuroscientists host brain-inspired events to inform the public and policy makers of the importance of brain research.

Dr. Olivera is best known for his work on conotoxins, which are compounds that he discovered in the venom of a class of predatory sea snails called cone snails. His interest in cone snails began as a child in the Philippines, where he enjoyed collecting their shells. Today, he studies the biodiversity of cone snails and their mechanisms of hunting & defense.

Cone snails hunt their prey using needle-like teeth to harpoon fish and release neurotoxic venom, which causes near instantaneous paralysis. Dr. Olivera, along with his colleagues, identified over 100 compounds present in the cone snail venom. They injected each compound individually into mice to and observed the resulting physiological responses. Each compound had different effects, from inducing a comatose-like state to encouraging jumping to causing the mice to run in a circle. The two most potent compounds in the venom, conotoxin alpha and beta, work synergistically by blocking different ion channels.

The Science Café concluded with a question & answer session that led to a lively discussion on topics ranging from the medical benefits of conotoxins for intractable pain to how the cone snails don't paralyze themselves after eating their prey.

In addition to Dr. Olivera's Science Café, there were 13 brain-inspired exhibits on display throughout the lobby. There were exhibits from



Pat Randall, Christie Lee, James Robers, and Kristen Blanton at the Brain Awareness Week Science Café. Photo courtesy of Shannon Farris, NIEHS.

North Carolina State University, East Carolina University, and several non-profits, including the Brain Injury Association of North Carolina (BIANC). There were exhibits on the role of oxytocin in pair bonding of prairie voles, electroencephalogram demonstrations, larval drosophila with fluorescently-tagged neurons, and even an iPhone rigged to measure action potentials in facial muscles.

Approximately 300 people visited the museum to learn about the brain and the research being done in the area. Guests also had the opportunity to attend 4 short talks presented by students in the Daily Planet Theater.

The museum and neuroscientists involved are eager to host the event again next year and invite additional participation from other laboratories, institutions and non-profits. The organizers thank the W.M. Keck Center for Behavioral Biology, the NC Museum of Natural Sciences, WRAL, NC State University neuroscientists, the ECU Psychology Department, BIANC, and the Triangle SfN Chapter for their combined efforts that made this event successful!

-Shannon Farris, NIEHS

NORTH CAROLINA TRIANGLE CHAPTER SOCIETY FOR NEUROSCIENCE
MEMBERSHIP AND DUES FOR 2015

Annual Dues:

Regular Membership: \$20.00/year or \$50.00/3 years

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