As your newly-elected President of the Western North Carolina chapter of the Society for Neuroscience, I would like to take this opportunity to extend a warm welcome to all of our new and returning faculty and students. Let me also thank the outgoing officers of the chapter for their exemplary service, and introduce you to the rest of the new team: Evgeny Budygin as the Secretary/Treasurer, Joost Maier and Fadel Zeidan as faculty Councilors, Cormac O’Donovan as the Clinical Councilor, David Klorig as the Post-doctoral Councilor, and Josh Seideman as the Student Councilor. Tina Payne will continue to serve as our staff coordinator, and Stephen Day serves as Editor of the Neurotransmitter.

Our goals for the coming year remain the same: expanding our membership across western North Carolina and translational and clinical departments, maintaining standards of excellence in research, continuing community outreach, and hosting a number of stimulating speakers from nearby chapters and beyond. Recommendations or requests for specific speakers or topics can be sent to me directly. We will also continue the traditions of the Research Day near the end of the Fall semester and the Spring retreat, and will seek to expand our speaker exchanges both within our own chapter and with our neighboring institutions. As always, your financial support of the chapter is critical to these efforts, so please contact Tina Payne or Dr. Budygin to ensure that your dues are up to date.

The present issue of the Neurotransmitter is focused on information most pertinent to more junior students, with invited articles from new faculty, advice from more senior faculty, and some tips on grant preparation and traveling to the upcoming Society for Neuroscience meeting in San Diego. I look forward to working with you all in the coming months, and hope to see you at the next WNCSfN event. Let’s have a great semester!

Yours,
Benjamin A. Rowland, Ph.D
Welcome to a new year at Wake Forest and to a new issue of the Neurotransmitter! I was asked to pen a few remarks on the importance of our neuroscience graduate programs, and to place them into the context of initiative across the larger university.

Neuroscience is a very popular degree path and we have a very strong program at Wake Forest. Recently, under Carol Milligan’s leadership we have added a number of degree options, including a still-new BS/MS option for undergraduates on Reynolda campus who have declared a Neuroscience minor, and a new collaborative MS degree effort with the Maya Angelou Center for Health Equity. Space doesn’t allow detailed description of these programs, but the sponsoring faculty have several overall goals for them: to enhance neuroscience as a discipline, develop novel paths for neuroscience training, provide exposure to our excellent PhD programs, and to promote greater cross campus engagement in research.

There are a number of other significant changes you will notice this year. First, the Medical School has moved downtown from Hawthorne campus into their new building. The Graduate School main office will also be moving downtown (initially to 525@Vine), but we will maintain a presence in the Hanes building.

In addition, the Graduate School has adopted Canvas as our new learning management system (LMS) and a new lecture capture system (Echo360). These will replace the eWake LMS and Tegrity lecture capture system. Training for faculty instructors and students is going on right now. A major advantage of these new systems will be a friendlier interface and better alignment with Reynolda campus, the Med School and Virginia Tech (with whom we deliver select courses). This alignment will allow greater flexibility in course delivery and an overall better student experience. Please don’t hesitate to reach out to me if you have any questions about these and other initiatives in our graduate programs, or if you have innovative ideas for improving your experience at Wake Forest.

On another note, I have co-edited the Neurotransmitter since the first edition, but I’m now passing this formal responsibility to the leadership of the Chapter who I am sure will continue to do an outstanding job! I’ll continue to pitch in and contribute support where I can. The newsletter has been a great resource for connecting our program students and faculty, and to allow our students to exercise a different set of muscles in science communication. I’m looking forward to a great year ahead!

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Student Wellness Committee

Mental and physical health are fundamentally linked. As Dr. Paige Greason mentioned during orientation, research shows that it is important to not only have a healthy diet for your physical health, but also a healthy diet for your mental health. That diet includes seven key areas of wellness, including connecting time, play time, down time, sleep time, focus time, physical time, and time in. The Student Action Wellness Committee for the Graduate School is committed to ensuring that you get a healthy diet of these essential nutrients for optimal cognitive functioning. As a member of the wellness committee, you would help plan and organize, as well as attend, various events that you feel would help students attain the aforementioned areas of wellness. Various events include barbeque mixers, movie nights, game nights, and potlucks, among others. If you’re interested in participating in the wellness committee, or would like to hear more about the upcoming events for this year, please contact Allison Dyevoich via email at adyevoic@wakehealth.edu.
The Full Program for Neuroscience 2016 is now available online. Plan ahead with the 2016 Neuroscience Meeting Planner with the following useful features that will help you plan your trip by:

- Theme
- Meeting Day & Time
- Session Types
- Curated Itineraries
- Professional Development Workshop Tracks

Additional Events to plan for:

- SfN Sponsored Social Events
- Convention Center Floor Plans
- Attendee & Speaker Resources
- Shuttle Schedule & Route
- Special Lectures
- Featured Lectures
- SfN Pre-Conference Session
- Exhibitor List
- Satellite Events

Special Lecture Series
(Find more here)

Yasmin L. Hurd, PhD
Icahn School of Medicine at Mount Sinai

Translational Neuroepigenetic Insights of Addiction Vulnerability

Drug addiction involves complex interaction of dynamic processes that contribute to individual vulnerability from early stages of development and during different phases of life by linking genetic factors with environmental experiences. This lecture will focus on the neurobiological insights we have gained about the molecular underpinnings of substance abuse (particularly cannabis and opiates) using multidisciplinary translational approaches in humans and animal models. The work presented will illuminate epigenetic mechanisms associated with addiction risk, even across generations.

3
Tuning Auditory Circuits for Vocal Communication

Social communication reflects the coordinated development of sensory and motor circuits around signals that convey information. The young brain, learning to communicate with hearing and voice, builds auditory and vocal motor circuits that are functionally coupled to perceive and produce similar signals. This lecture will describe progress made using songbirds to understand how species identity dictates the capacities and limits of vocal learning, how early experience shapes auditory and vocal circuits, and how species and learning combine to map auditory tuning onto vocal acoustics.

Saturday, Nov. 12, 5:15–6:25 p.m.

Limitations on Visual Development: Neurons and Behavior

Vision develops over many months in primate infants. The neural mechanisms that limit visual function are not fully understood. During development, neurons in visual cortex are more sensitive than would be expected based on visual behavior. Abnormal early experience creates a specific disorder — amblyopia — which permanently disrupts vision. Here also, the sensitivity of neurons in visual cortex exceeds behavior. This talk will describe neural limits on normal and abnormal postnatal visual development based on studies of brain and behavior in human and nonhuman primates.

Sunday, Nov. 13, 5:15–6:25 p.m.
Toward Whole-Body Connectome in Drosophila

Our brains receive information from sensory neurons about our external environment and internal organs. To understand how the brain processes information and initiates motor outputs, scientists are constructing complete wiring diagrams called “connectomes” that map all neural connections in the brain and body. Taking Drosophila melanogaster as an example, this lecture will address challenges in building whole-body connectomes and how that knowledge may help us better understand normal function and treat disease.

Monday, Nov. 14, 5:15–6:25 p.m

Neurobiology of the Adolescent and Young Adult Brain Reveals Unique Strengths and Vulnerabilities: Debunking Myths

Experimental and human evidence reveal that adolescence is a paradoxical state, with enhanced synaptic plasticity, yet incomplete myelination and regional connectivity. Full maturity is not reached until the third decade. Adolescent brain neuroscience impacts our understanding of patterns of onset of psychiatric illness, the long-term effects of exposure to substances of abuse and stress, and also explains their advantage in learning and memory and why they exhibit “signature” behaviors such as impulsivity, emotional liability, altered sleep cycle, and susceptibility to addiction.

Tuesday, Nov. 15, 5:15–6:25 p.m.
The Wake Forest Brain Awareness Council (BAC) is a graduate student-run outreach program designed to raise awareness about neuroscience, neurological disorders, and science education in the NC Triad community. We have developed a number of activities specifically designed for elementary and middle school children, high school students, and adult learners. Our primary activities include regularly scheduled school visits in which our volunteers teach local K-12 classes. For a younger audience, these visits typically include hands-on stations with real human and animal brains, a "Build-a-Neuron" station using pipe cleaners, and a "Visual Adaptation" station where kids take part in a demonstration of neural plasticity. Our high school visits center around a lecture on basic neuroanatomy and physiology as well as hands-on interaction with human and animal brains. In addition to our classroom visits, BAC maintains a supply of neuroscience-related models, videos, and lesson plans for teachers to use free of charge through our Lending Library.

For Brain Awareness Week, we partner with the Dana Foundation to host two events during March at the Winston-Salem Children's Museum and Sciworks. These events allow both classes and families to explore the wonders of neuroscience through different stations, such as "How Hearing Works," "Multisensory Integration," and of course “Human and Comparative Brains.” We encourage graduate and undergraduate students from all departments and specialties to volunteer for these events. We additionally host another major public event called Neuroflix in which BAC partners with a local venue to screen a movie or documentary related to neuroscience or a neurological disorder. Following the film, an expert panel comprised of scientists, physicians, and activists addresses questions from the audience. Our past movies have included Memento, Inception, and Hell and Back Again, a documentary about post-traumatic stress disorder. BAC provides an invaluable service to our community and can be extremely rewarding. If you are interested in any of the activities described above or would like to partner with BAC for an event, please contact us at bac.wfu@gmail.com or email one of our Steering Committee members. Keep a look out for BAC news and events on our website, and follow us on Facebook and Twitter (@WFU_BAC)!
What are the main research questions being investigated in your lab?
My research is focused on discovering basic neurobiological mechanisms that support human cognition and human decision-making. I view this problem from two perspectives: (1) basic physiology and neurobiology, and (2) computational problems these systems must solve. The following basic questions guide the work in my lab:

• How does activity in the human brain give rise to human experience, human beliefs, and human choice behavior?
• How does the environment and social interaction modulate these processes?
• How can we use answers to these questions to improve the quality of life of all humans, but especially those that suffer from neurological and psychiatric conditions?

What are the primary techniques are used to answer those questions?
My laboratory uses intracranial measures (e.g., human voltammetry, stereo-EEG, and micro-electrode recordings) as well as noninvasive neuroimaging tools (e.g., fMRI and MEG) to measure brain activity during conscious decision-making in humans. We use behavioral tasks that are constrained by computational considerations borrowing ideas from game theory and machine learning. In combining these disciplines we investigate how the human brain navigates decision-spaces to discover neural process that are involved in real-time human experience and decision-making. We extend our work in the human brain with the use of model organisms and in vitro experimentation to develop new tools for use in human neuroscience and to investigate basic neurobiological processes by asking questions motivated by our discoveries in the human brain.

Why did you choose to come to Wake Forest to study neuroscience?
My research approach is unique and requires support from basic and clinical investigators. The research and clinical community at Wake Forest School of Medicine is extraordinarily supportive and a place I felt I could grow and innovate new boundaries in human neuroscience. My joint appointment and recruitment by the Department of Physiology and Pharmacology and the Department of Neurosurgery exemplify the cross-disciplinary bridge I hope to build as my laboratory grows. Through my appointments I have the amazing opportunity to work side-by-side with neurosurgeons interested in scientifically investigating human brain function.

During your scientific career what helped you decide you wanted to stay in academics?
My enjoyment of the scientific approach and its ability to generate new knowledge, understanding, and applications provided me much more lucrative non-academic career possibilities; however, only in academia is one expected to pursue new knowledge and understanding simply for the sake of new knowledge and understanding.

...continued on pg. 8
I see academic science as a long-term solution for many if not all of the problems we face as individuals and as a society. Early on I realized that I am so passionate about science that I would always be engaged in scientific thinking and the empirical approach. Where I landed (re: rank) in academic science became less relevant than being able to have the privilege to do science for a living. Thus, I feel fortunate to have landed a tenure-track position at well-respected institution like Wake Forest School of Medicine and to direct the next phase of my research.

Do you have any new and exciting findings that you would like to share with the local neuroscience community?
We have just published (Kishida et al., PNAS 2016) the world’s first real-time measurements of dopamine release in the human brain during conscious decision-making. We tested an over 20-year-old hypothesis that has been primarily supported by work in animal models and discovered that this model was incomplete in describing what dopamine release encodes during human decision-making. A commentary describing the significance of this work was published in the same issue (Platt and Pearson, PNAS 2016).

How would you describe your mentoring style and what are you looking for in a student who would join your lab?
I view the mentor-mentee relationship as a collaborative one. Ideally the mentee’s goals are aligned with the mentor’s goals. In this way the pair work together as a team while the mentee gains the expertise and capacity to work independently. The mentor’s responsibility is to provide an environment where the mentee can work independently to learn, expand their knowledge and understanding, and experiment (with ideas as well as reagents). The mentee’s responsibility is to be open to ideas and perspectives that the mentor can provide; further I expect mentees to work with passion and diligence, as I would do in return.

What kind of lab dynamic do you strive for?
I thoroughly enjoy all aspects of science and I hope my laboratory dynamic will reflect this. I expect the group to be hard working, but to be so because they are curious, ambitious, and enjoy the work and the people they work with. We should share common goals and strive to help each other attain those goals. In my mind this will be most productive and energizing for the team and should make for a overall fun environment.

Who is in your lab?
I have just joined the faculty at Wake Forest School of Medicine this summer. I currently have one laboratory technician set to start in mid-September and am recruiting another. I am also accepting rotation students and hope to find an exceptional graduate student (or two) to join my group.
Starting graduate school can seem exciting with all of the different opportunities. And while it is exciting, the first year of graduate school is also intense, exhausting and humbling. Here are a few things that have helped me, which may also help you.

**Focus on doing well in your classes** – Make course work a priority. What you learn during your first year will be an extension to your knowledge base, and may help you narrow down your research interests. You may feel the need to focus all of your time in lab instead of making time to study. While it can seem difficult to balance the two, find what works for you and talk with your advisors if you need more time to focus on classes. You will find that most will be understanding. Course work will eventually die down and you will have more time to focus on lab work, and a better understanding of what you’re doing as well.

**Make sure your lab is a good fit** – Make an effort to truly grasp what your lab is about. Are you interested in the research? Do you mesh well with the lab members? Is your advisor’s mentoring style what you need to succeed? You should be asking yourself these questions early on. Be sure your research project is something that you find interesting. It can and should provide you with some sense of fulfillment. Lab members also provide guidance, help, encouragement, and solidarity. Make sure these are people with whom you can get along, and that your personalities somewhat blend. Finally, know your advisor’s expectations and be clear about what you need. Your advisor should be your advocate, mentor, and ally. Be sure their mentoring style works for you. Assessing these things will help you decide early on if there is some conflict and if it can be overcome. Your ability to do well can depend on all of these things and your research and lab environment will be a significant part of your life over the next few years; finding the right lab can ensure those years will be pleasant.

**Time management and work-life balance** - Between classes and lab work things can often seem overwhelming. Manage your time efficiently. Know when you need to buckle down on work and when you need some time away. Use downtime between class and lab work to get to know the literature. Keep good notes of articles you read and begin compiling your own review. This will help you troubleshoot when things go wrong, develop original ideas, and be a good start to writing your thesis. You should also use this time to take care of yourself: exercise, get sufficient sleep, and spend some time away from your work. Having a work-life balance is essential to success. It insures you don’t burn out and provides your mind a reprieve to improve and process everything you are learning.

Ultimately we all have shared this experience. Everyone has felt uncertain and you are not alone. Don’t forget to ask senior graduate students for help. They have been where you are and most will gladly offer what help they can. Graduate school is designed to challenge you, hone your expertise and teach you how to be an independent scientist. This experience is what you make it. Do your best work and don’t forget to enjoy it.
How beautiful is this flowering tree! If you look closely, these flowers are actually the rosettes of human neural stem cells grown in a lab dish. These rosettes are very powerful with a potential to make entire human brain (represented as a Crown) and spinal cord (represented as a trunk) with trillions of connections (Represented as roots)! These incredible flowers offer a great hope for the patients suffering from various brain disorders or diseases like Stroke, Alzheimer's, Parkinson's, Multiple Sclerosis and many more!!!

Artist:  **Dr. Gauriulkarni**  
Medium:  **Acrylic on Canvas**  
Contact:  **bestgk@gmail.com**

As described in the attached article (click here), tardigrades are tiny (1 mm) invertebrates related to Arthropods that can survive in some of the most extreme environments on earth and in space. They are affectionately known as “water bears” or “moss piglets” and have been described as a “cannon wearing wrinkled khakis “a plump piglet in a puffer coat” and having “a front end that resembles a nozzle for a vacuum cleaner” (see figure below). Because of their ability to survive harsh conditions and their current comeback as a model for biological research, they are the ultimate comeback kids of biology.
The WNCSfN and Neurotransmitter Staff would like to congratulate the following students and faculty for their recent achievements!

Nicole Emerson, who worked with Bob Coghill, defended her thesis this summer. She has received the John's Hopkins Neurosurgery Pain Research Institute's Post-Doctoral Fellowship grant.

Elaine Shing, who worked with Christian Waugh, successfully defended her dissertation over the summer and has returned to medical school.

Bryan Neth, who worked with Suzanne Craft, successfully defended his dissertation over the summer and has returned to medical school.

Adreinne Adler was awarded an individual NRSA award.

What *The Neurotransmitter* can do for YOU:

- Inform you about new and upcoming events in the NC Triad
- Find out how to get involved in the neuroscience community
  - Advertise current or forthcoming clinical trials
  - Connect and network with neuroscience faculty
  - Show off snazzy pictures taken in (or out) of lab!

Have something to share? Interested in getting involved? Email Stephen Day for more information!

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