

Neural Networking

Newsletter of the North Central Florida Society for Neuroscience

Advancing the Understanding of the brain and nervous system



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Welcome to NCF-SFN's Spring 2015 Season!

By Joseph McQuail, Chapter Representative

Spring is an exciting time for members of the North Central Florida Chapter of the Society for Neuroscience and your Executive Board has been hard at work planning activities for professional development, scientific exposition and community outreach. Notably, **Brain Awareness Week** is this week (March 16-20) and more information on our BAW outreach activities can be found in Brittany's column (page 4).

On Friday, March 20, we will hold our **Annual NCF-SFN Scientific Conference** (schedule on page 6). The morning will include a poster competition showcasing work by undergraduate and graduate students as well as post-docs and other chapter members. **Poster submission is still open and submissions will be accepted until March 18th!** Following lunch (provided by Honey Baked Ham), we will host a data blitz competition where students can hone their oral presentation skills. The afternoon will include a presentation by **Mrs. Paula Yorker of the Sia Brain Awareness Foundation** regarding her work to educate about brain conditions and also to provide scholarship support to Central Florida graduating high school seniors who attend a Florida college or university and are pursuing a Medical/Science course of study. Our scientific program will conclude with the Keynote Address delivered by our guest speaker **J. David Sweat, Ph.D.**, of the University of Alabama-Birmingham. More information on his important work in the area of epigenetics and memory can be found on page 2.



Spotlight on J. David Sweatt, Ph.D.: Histone H2A.Z subunit exchange controls consolidation of recent and remote memory

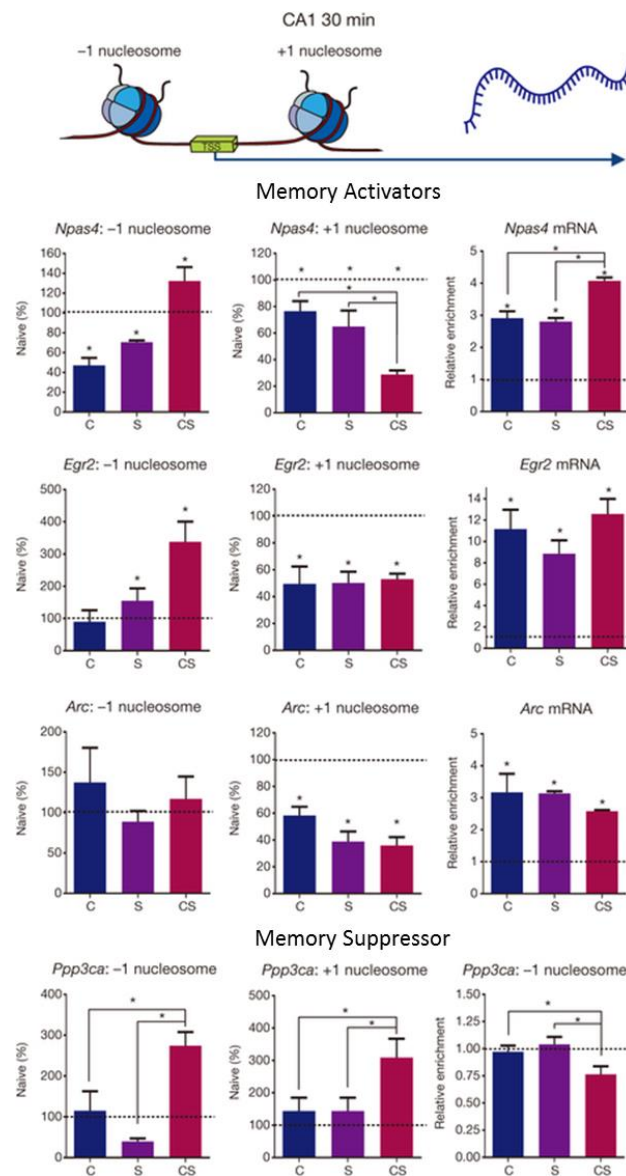
By Joseph McQuail, Chapter Representative

Memory formation is a multi-step process that initially requires hippocampal consolidation before transfer to cortical regions for long-term storage. While a variety of regulatory mechanisms control gene expression that is essential for neural plasticity, specific forms of epigenetic regulation have received minimal attention in neural circuits required for learning and memory. A recent study from the laboratory of Dr. J. David Sweatt, at the McKnight Brain Institute of the University of Alabama – Birmingham, details how histone variant exchange may regulate successful hippocampal and cortical consolidation of memory.

Histones form the protein core of nucleosomes and histone composition influences transcriptional activity. The H2A histone variant H2A.Z is present throughout the cortex and hippocampus and its expression is downregulated 30 minutes after contextual fear conditioning in mice. At this same time-point H2A.Z binding was further examined in the vicinity of transcriptional start sites of genes implicated in synaptic plasticity. Decreased H2A.Z binding downstream of memory promoting genes such as *Npas4*, *Egr2* and *Arc*, was associated with enhanced expression of these genes and in the case of *Npas4*, this effect was most robust in the context-shock group. In contrast, H2A.Z binding was increased upstream of the memory suppressor gene *Ppp3ca* and this led to a decrease in mRNA for this gene. Thus, while H2A.Z is exchanged both up- and downstream from transcriptional start sites, reduced downstream binding is permissive to the expression of memory-promoting genes and enhanced upstream binding restrains memory-suppressing genes.

Dr. Sweatt and colleagues next used AAV-mediated depletion of hippocampal H2A.Z expression to examine its contribution to memory and gene expression. H2A.Z depletion enhanced fear memory at 24 hours and also 30 days post-testing and leads to enhanced expression of memory promoting genes in fear-conditioned animals. Next they asked whether cortical H2A.Z was also essential for memory consolidation. Cortical H2A.Z depletion enhanced memory at 7 and 30 days, post-testing but not at 24 hours, consistent with the notion that cortical transfer is a later stage of memory consolidation. Thus, Dr. Sweatt and his research team have identified H2A.Z as a

critical regulator of both recent and remote memory. However, although H2A.Z exchange consistently regulated the expression of memory promoting genes such as *Npas4*, *Egr2* and *Arc*, genome-wide analysis identified more than 400 other genes also regulated by this specific histone variant. Therefore, H2A.Z remains a focus of ongoing study to better clarify the specific targets through which this histone variant exerts its effects on memory consolidation.



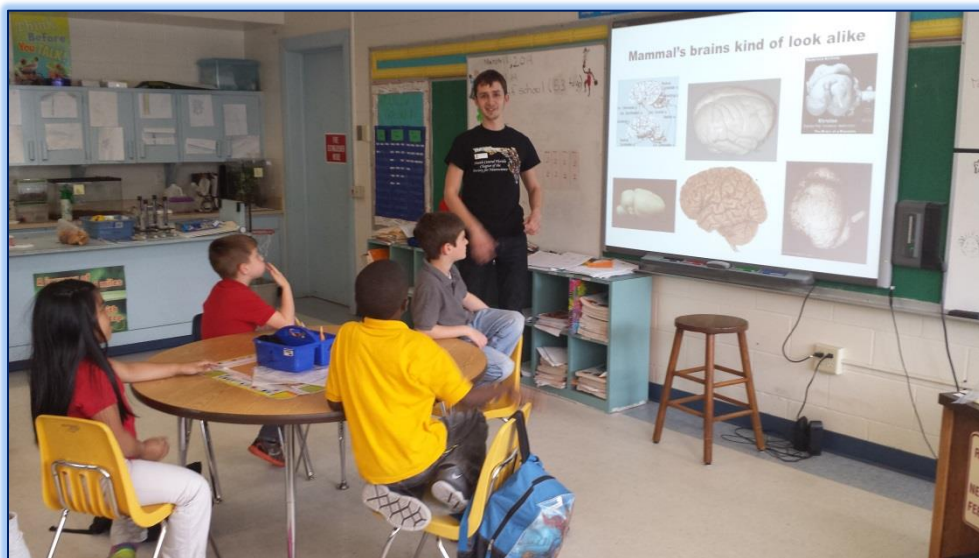
H2A.Z binding at the -1 nucleosome (first column) and +1 nucleosome (second column) relative to TSS as well as corresponding gene expression (third column). N, naive; C, context; S, shock; CS, context plus shock. Data are expressed as mean percentage \pm standard error of the mean (s.e.m.) relative to the mean of naive mice. *Follow-up comparisons with $P < 0.05$.

For more information on this study: Zovkic, I.B., Paulukaitis, B.S., Day, J.J., Etikala, D.M., and Sweatt, J.D. (2014). Histone H2A.Z subunit exchange controls consolidation of recent and remote memory. *Nature* 515, 582–586.

NCF-SFN's Brain Awareness Week 2015 Campaign

By Brittany Butler, BAW Coordinator

Each spring the North Central Florida Chapter of Society for Neuroscience participates in the annual Brain Awareness Week Campaign and 2015 is no different. The Brain Awareness Week Campaign was started to educate and excite K-12 grade students about the brain. In past years we have reach thousands of students in the Alachua County Public School System and other surrounding counties in addition to numerous homeschool groups that come to the McKnight Brain Institute. This year we expect to achieve record-breaking participation with regard to the number of students impacted by our outreach efforts and the number of UF student volunteers who are vital to the success of the chapter's BAW outreach activities. We are extremely excited to announce that we are expected to reach nearly 3000 students this year in Alachua County Public Schools, and not just in Gainesville proper, but also in the communities of Waldo, High Springs and Alachua. This is absolutely amazing. We will be conducting our traditional presentations ranging from brain art with the youngest students to sheep brain dissections with the oldest students, however this year we also added a human-to-human interface into the mix. This added bonus, courtesy of the awesome Neuroscience faculty at UF, will be sure to be a new favorite by the students (we certainly loved playing with it). Overall, BAW 2015 is shaping up to be the Chapter's best year yet and I only hope that we can continue to grow in our efforts to give back to the community through our understanding and knowledge of the brain.



Congratulations Acknowledgements and Announcements

Through the generous support of **Dr. Jada Lewis**, the NCF-SFN was able to sponsor two awards for best poster presentation at last month's College of Medicine Celebration of Research conference. The winners were **Sruti Rayaprolu and Gina Martuscello**. Congratulations to Sruti and Gina on their winning presentations and thanks to Dr. Lewis and our faculty judges for making this award possible!



Recently, **Dr. Caitlin Orsini** was selected as the **2015 Thomas H. Maren Junior Investigator Post-doctoral Awardee**. The Thomas H. Maren Junior Investigators Fund provides seed money for promising postdoctoral fellows in the College of Medicine. Award amount is \$25,000 per year for two years. Caitlin is post-doctoral fellow in the laboratories of **Dr. Barry Setlow and Dr. Jennifer Bizon**.

Dr. Joseph McQuail, a postdoctoral associate in the laboratories of **Dr. Jennifer Bizon and Dr. Barry Setlow**, was awarded 1st place in the 2015 Robert Levitt Research Award Competition. His winning presentation was entitled "Prefrontal cortical NMDA receptors in age-related working memory impairment". Dr. McQuail and four other finalists were selected from among 19 presenters in a poster competition hosted at Oak Hammock. These five finalists were invited to deliver oral presentations on their work and to answer questions from members of the Institute for Learning in Retirement (ILR). ILR members and faculty from the University of Florida judged each presentation and awarded Dr. McQuail 1st place. The award will be officially conferred at an upcoming ceremony in April.



Alexander Parker receives Fellowship from Epilepsy Foundation



Congratulations to Alexander Parker in the Sarkisian lab on the receipt of the Pre-Doctoral Research Training Fellowship from the Epilepsy Foundation





AGENDA

Evelyn F. and William L. McKnight Brain Institute

March 20th, 2015

9:00-10:45 am	Poster Competition	Founders Gallery
11:00 am	<p>Panel Discussions:</p> <ul style="list-style-type: none"> • Women in Science • Success in Academia • Communicating Your Science & Networking <p><i>Panelists: J. David Sweatt, Jennifer Bizon, Sara Burke, Mark Lewis, Julie Johnson, Gordon Mitchell</i></p>	LG-110
12:15-1:30 pm	Lunch	LG-110
1:45-2:30 pm	Data Blitz	DeWeese Auditorium
2:30-2:40 pm	Break	
2:40 pm	<p>Welcome Kim Hawkins President of North Central Florida Society For Neuroscience Chapter</p>	DeWeese Auditorium
	<p>Remarks by Lucia Notterpek, Ph.D. Chair of Department of Neuroscience</p>	DeWeese Auditorium
2:45 pm	<p>Mrs. Paula Yorker Executive Director of <u>Sia</u> Brain Awareness Foundation</p>	DeWeese Auditorium
3:10 pm	<p>Keynote Speaker – <i>J. David Sweatt, Ph.D.</i> <i>"Epigenetic Mechanisms in Memory Formation"</i></p>	DeWeese Auditorium
4:15 pm	Poster Awards Presentation & Closing Remarks	DeWeese Auditorium
4:30-6:00 pm	Faculty/Post-Doc/Student Mixer	L5-101A



Graduate Student & Post Doctoral Symposium

Biology at the Beach

Open to all scientific disciplines!

Cook Out
Poster Blitz Session
Beach!



Competition & Prizes
Short Talks
Kayak Eco-Tour

The Whitney Laboratory for Marine Bioscience

Saturday, May 16

9:30am - 6pm

For registration (\$15) and presentation/poster submissions
email biologyatthebeach@whitney.ufl.edu by May 8th

