

The CSfN Conference: Research of the Best Minds in Neuroscience

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On Friday, March 31st, 2017, the Chicago chapter of the Society for Neuroscience (CSfN) met at Northwestern Medical Hospital in Chicago, IL. This meeting serves to provide a yearly professional venue for neuroscientists across the Midwest to participate in symposiums, poster sessions, and competitions. Hundreds of neuroscientists, post-doctoral researchers, graduate students, and undergraduates met and discussed their research and recent progress in the field of neuroscience. I attended this conference as an undergraduate student from Lake Forest College and although I was not presenting any research, I still felt welcome in this amalgamation of some of the best minds and research in neuroscience.

At the CSfN conference, quite a few researchers discussed their important topics. During the Presidential Symposium in the morning, Dr. Kantarci started off the day's seminars by discussing how diffusion tensor imaging can be used to help diagnose Alzheimer's disease. Dr. Wagner then discussed how she is using certain biomarkers to better diagnose traumatic brain injuries (TBIs) and how this can be applied to the rehabilitation of TBI patients (dubbed Rehabilomics). After this talk, Dr. McKee, during the highlight and keynote that morning, discussed her insightful work regarding brain damage in football players and veterans. Following these three presentations, the conference attendees spent a few hours examining and discussing undergraduate, graduate, and post-doctoral posters that summarized their recent research in neuroscience. Presenting from Lake Forest College were Rosemary Thomas, Emily Ong, James Haney, Lily Veldran, and Dr. Hedrick. After the poster session, the conference re-convened for six talks by graduate students. These students were sent by their universities to discuss their cutting-edge neuroscience research. Following the graduate symposium, Dr. Robinson, Dr. Carter, Dr. Cacioppo, and Dr. Pinna explored the field of social neuroscience through their insightful talks. These talks examined concepts such as how genes influence behavior and the connections between oxytocin, a neurotransmitter, and feelings of affection.

At the CSfN conference, there were two major emerging themes I saw. The three talks in the morning, along with several posters in the afternoon, discussed the effects of TBIs (and other structural abnormalities) on the human brain, and how to identify them. While Dr. Wagner discussed how to identify TBIs to better personalize a patient's treatment, Dr. McKee discussed how TBIs occur and how they can progress and eventually kill the patient. Interestingly, Dr. McKee highlighted that after injury, TBI patients continue to decline in neurological and mental health and can develop a disease called Chronic Traumatic Encephalopathy (CTE). Somehow, TBI sets off a chain reaction, resulting in long-term degradation of the brain with specific and characteristic markers (such as lesions and shearing stress). Novel research into this important field of study is also reflected in the work exhibited by many undergraduate, graduate, and post-doctoral researchers at the conference. For example, undergraduate researchers at the Northwestern University Feinberg School of Medicine discovered that in Parkinson's disease, the R-SNARE ykt6 protein is disrupted by the alpha-synuclein protein, leading to a loss of lysosomal function in Parkinson's disease (Tsutsumi, K., Cuddy, L. K., & Mazzulli, J. R., 2017). Essentially, the researchers identified a mechanism explaining how the lysosome of some neurons degrades in Parkinson's disease. However, lysosomal function was restored when the researchers over-expressed the ykt6 protein. This could reduce the pathology of Parkinson's disease and quite possibly lead to a novel treatment.

Personally, I found the research exhibited at the CSfN conference to be diverse and exciting. Much of the research focused on various neurodegenerative diseases and may very well lead to a cure and a greater understanding of these diseases. However, not all the research discussed neurodegenerative diseases. Some of the research investigated normal neurological processes. For example, undergraduate researchers at Loyola University used fruit flies (*Drosophila*) to understand how cells regulate the circadian rhythm, the natural biological clock (Bajwa, S., Bajwa, T., & Cavanaugh, D., 2017). They found that by removing some

genes in *Drosophila*, the strength of the circadian rhythm was reduced. Along with other findings from the same study, the authors concluded that the circadian rhythm is communicated from one neuron to another in part by modifying the existing cell activity, presenting a new mechanism for how circadian rhythm information is communicated between neurons. Just like many other research posters and seminars at the conference, this research shows just how quickly the field of neuroscience is advancing. Researchers are discovering numerous neurological mechanisms, investigating diseases, and developing treatments.

To be sitting in a conference of like-minded biologists, doctors, neuroscientists, and many others was an incredible experience. Similarly, Lake Forest College has an extensive and close community of scientists that meet to discuss their findings and share ideas. At CSfN, there were many opportunities to become engaged with the scientific community. Supply companies set up tables to show researchers their equipment and how useful it could be in research. Small-group discussions were held during lunch to give career advice to students, both in neuroscience and biology. For me, this was of particular interest as I am still unsure of the exact path I will take after graduation from Lake Forest College and I was amazed at how accessible the CSfN conference was to non-experts. I am currently taking BIOL/NEUR 130 and I understand most of what is discussed and presented. Although I do not have a master's degree or a doctorate, I could still engage with the scientific community. But, don't take my word for it! According to Scott Johnston (a student at Lake Forest College), "as an undergraduate senior having experienced CSfN for four years, I find that it is an engaging and exciting experience to see the work being presented by a diverse group of students" (personal communication, April 11, 2017).

In summary, many researchers are looking at how to better diagnose, treat, cure, and prevent various neurodegenerative diseases, including TBIs. Currently, this is the best theme for the conference. I believe the field of neuroscience is experiencing a rapid expansion of the resources and technology available. However, there should also be a focus on how to correctly and ethically apply these advances. I think a great theme for future CSfN meetings would be the ethics of neuroscience, or bioethics in general. As our technological capabilities increase at an ever-growing rate, the scientific community should continually revisit our definitions of right and wrong to ensure the scientific community is progressing both quickly and cautiously.

Note: Eukaryon is published by students at Lake Forest College, who are solely responsible for its content. The views expressed in Eukaryon do not necessarily reflect those of the College.

References

- Bajwa, S., Bajwa, T., & Cavanaugh, D. (2017, March). Identification of Circadian Output Genes that Affect Rest:Activity Rhythms in *Drosophila*. Poster presented at the SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University – Memorial Hospital, Chicago, IL.
- Kantarci, K., MD. (2017, March 31). Diffusion tensor imaging of structural connectivity in Alzheimer's Disease. Speech presented at SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University - Memorial Hospital, Chicago.
- McKee, A., MD. (2017, March 31). Football and the Brain. Speech presented at SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University - Memorial Hospital, Chicago.
- Robinson, G., PhD, Carter, S., PhD, Cacioppo, S., PhD, Pinna, G., PhD. (2017, March 31). Social Neuroscience. Speech presented at SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University - Memorial Hospital, Chicago.
- Tsutsumi, K., Cuddy, L. K., & Mazzulli, J. R. (2017, March). R-snare Protein Ykt6 Restores Lysosomal Function in Parkinson's Disease Cell Model. Poster presented at the SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University – Memorial Hospital, Chicago, IL.

Wagner, A., MD. (2017, March 31). Rehabilomics Research: A biomarkers based approach to assessing multimodal outcomes after TBI. Speech presented at SfN Chicago Chapter 2017 Annual Scientific Meeting in Northwestern University - Memorial Hospital, Chicago.