Learning Beyond the Classroom

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The most academically beneficial college experiences occur when lessons learned inside the classroom can be utilized outside. The molecular neuroscience class, my biology class, and I had the privilege to attend the Chicago Chapter of the Society for Neuroscience 2013 Scientific Meeting. Numerous leading neuroscientists came to present their research and learn from their peers. Many undergraduate and graduate students from various universities in the Midwest were also in attendance to present their research lab's findings. I attended this conference to gain insight on the most recent research in neuroscience and to see graduate students present their findings. They showed that hard work as an undergraduate student can pay off.

The theme of this conference's presentations was stem cell research, which is currently a hot topic within the neuroscience community and beyond. "The focus on research being done with stem cells was definitely the ideal choice for these presentations because of its current popularity as an option for advancing therapy and knowledge of neuron differentiation," Niko Escanilla '16 said. This year was the ideal opportunity to present new research involving stem cells because it is a field that is expanding in possibilities and interest at an unstoppable rate. The use of this kind of research was spotlighted as possible therapeutic methods for age or illness-related neurodegeneration, increasing adult brain plasticity, and preventing diseases like Huntington's disease through genetic testing.

The conference began with an informational meeting for undergraduate students. "I appreciated that the day began with a meeting of the undergraduate students because it felt very welcoming in the midst of a room of adult neuroscientists," Saul Bello Rojas '16 shared.

The presidential symposium opened with Dr. Arnold Kriegstein, who spoke on neural stem and progenitor cells in human cortical development and evolution. He discussed how the neocortex may expand in primates through a growth in population of radial glia or increased transit amplification of daughters. I connected this topic to what I have learned about radial glia's role in the development of the central nervous system in my biology course.

The next presentation was titled "Stem and Progenitor Cells in the Adult Brain- Restoring Aging Related Declines in Memory," presented by Dr. John Kessler. He focused on the relationship between noggin and BMP4, where overexpression of noggin accelerates differentiation, and overexpression of BMP4 slows neuronal differentiation. He therefore proposed the novel idea that noggin can be manipulated as a rapid way to make new neurons. Something I found interesting was that animals with high levels of noggin are much smarter and happier. I also learned that antidepressants increase levels of noggin in only two weeks. This finding is an example of how complex the effects of drugs are.

The final presentation of the presidential symposium was "CNS Stem Cell Transplantation- The Eyes Have It" by Dr. Sally Temple. Dr. Temple showed the surprising plasticity of the human retinal epithelium and how it can be used therapeutically. This is an intriguing alternative to fetal stem cell research because usable eyes are in abundance, less controversial, and easily accessible relative to fetal stem cells.

The keynote speaker was Dr. Rudolf Jaenisch, and he spoke on stem cells, pluripotency, and nuclear programming." Dr. Jaenisch focused on epigenetic regulation of gene expression and researched different avenues for regenerative medicine. His lab successfully engrafted induced pluripotent stem cell derived neurons into fetal mouse brains and reduced their symptomatic Parkinson's disease. This directly related to what I am currently studying about Parkinson's disease's chronically low levels of dopaminergic neurons and hypokinetic movement. Although Dr. Janeisch spoke with passion and intelligence, his presentation was probably most enjoyed by his peers and not the students in the audience, due to its complex nature.

One of the most popular aspects of this conference was the poster competition because it highlighted students' hard work and research in an encouraging manner. There were poster competitions for undergraduate, graduate, and postdoctoral students to participate in. Students from Lake Forest College won second and third place in the undergraduate

poster competition.

One poster that stood out was titled "Can Melatonin Help Prevent Alzheimer's Disease?" by undergraduate K. Clausen from DePaul University. She researched the relationship between melatonin and β-amyloid because the chemical substance has been shown to inhibit oxidative stress and the death of neurons exposed to the peptide. I enjoyed this poster because it demonstrated how analysis of each step is important when researching a major hypothesis, and when I asked what the next step would be in their lab's study I found out that they eventually hope this will be studied in vivo.

A favorite graduate poster of mine was titled "Effect of Adolescent Alcohol Exposure on Behavioral Flexibility and Orbitofrontal Cortex Activity" by L.R. Amodeo from University of Illinois, Chicago. She studied the effects alcohol binging has on an adolescent's developing brain during the critical period of the cortico-striatal pathway, important for decision-making and rewards. This study was very thorough; however, she had difficulty in defining the specific age group of adolescents that are most at risk when drinking.

Other themes the conference could have considered are perception and the transfer of sensory information into organized percepts, the neuronal basis of consciousness, or research being done on learning and memory at the synaptic level. I agree with him in that this conference's presentations measured up to my expectations. This conference had a large impact on the neuroscientists that were in attendance, this was obvious because of the numerous questions that were asked after each presentation and the inquiries the scientists approached each other with during the intermissions. However, I do not think that this conference immediately impacted the general pubic because there was little news coverage.

Undergraduates should take the opportunity to attend similar conferences because it is a learning experience outside of the classroom that teaches students not only about the newest research being done in the field, but also about what possible future careers or avenues of research are available to them. It is important for students to be able to visualize the day-to-day work they hope to go into, and this conference did that for undergraduate students contemplating going into research. Sherin Varghese 16' confided, "I had never considered going into research after college, but these presentations are so interesting, I would consider working in a lab now!"

My peers and I improved our abstract thinking by listening to complex presentations given by prestigious neuroscientists, and although we may not have understood everything we exercised our brains to extract the aims and main findings. Rachel Gonzales 13' explained, "Even as a senior I did not understand the keynote speaker's presentation completely, but I was still able to enjoy it and learn from it." The Chicago Chapter of the Society for Neuroscience 2013 Scientific Meeting was a success for all who attended because novel research in the field was introduced and students added to the knowledge they had learned in the classroom.