

## **Meet Our Members: Ermyntrude Adjei**

Ermyntrude (Trudy) Adjei, MS, is a Biomedical Engineering PhD student working in the Neuroimaging and Motor Control Laboratory at Northwestern University with Dr. Jun Yao and Dr. Julius Dewald. ASNR was excited to welcome Trudy as a new member earlier this year, and she joined our vibrant professional society to expand her network, collaborate, and contribute to the advancement of the field of neurorehabilitation. Trudy is one of four talented individuals selected to receive a 2023 ASNR Diversity Fellowship, and this award provides travel, training, and mentorship support. She shares more about herself and her research in this interview.



### **1) How did you get interested in science, and what steps did you take to get to your current role?**

My interest in science was ignited during my childhood in Ghana as I was curious about people with disabilities. I did not quite understand why they were different, and in my curious mind, I wondered how they could be integrated into society. Initially, I assumed pursuing a medical degree was the only way to answer this question. However, my aversion to blood led me to discover the field of biomedical engineering, which offered a suitable path to pursue my passion without dealing with bodily fluids! I obtained a degree in Biomedical Engineering from Kwame Nkrumah University of Science and Technology, followed by a one-year master's program at Arizona State University (ASU) through the international accelerated degree program supported by the Mastercard Foundation Scholarship. It was during my time at ASU that I became fascinated by the brain's ability to adapt, learn, and rewire.

Driven by my curiosity, I actively sought out research opportunities, such as joining the Center for Neural Systems Laboratory and working on gait training for Parkinson's disease patients. I also completed a thesis in the Neuromuscular Control and Human Robotics Laboratory, focusing on the role of sex differences in ankle properties. These experiences deepened my understanding of biomechanical aspects, particularly related to walking, and ignited my passion to address challenges faced by individuals with neurological disorders.

Building upon this foundation, I am currently pursuing a PhD in Biomedical Engineering at Northwestern University, where I have the opportunity to delve deeper into the neural

mechanisms of movement. I am excited about the possibilities that lie ahead on my journey of contributing to advancements in the field of neurorehabilitation.

## **2) What is the focus of your current research, and what are some of your findings?**

My current research is focused on understanding how different brain areas, particularly the motor cortices and the brainstem, communicate as you prepare to make movements. The brainstem is the origin of a very diffuse descending pathway to multiple spinal motor neurons of the upper extremity. Therefore, it is likely that engagement of this diffuse pathway may trigger coactivation of multiple muscles across joints.

In the healthy brain, it is still very unclear how these brain areas communicate prior to movement and whether this communication is task-dependent. By gaining insights into this communication, we can establish a foundational understanding of the neural mechanism of motor control and its implications for conditions like stroke or Parkinson's disease. Although I'm in the early stages of my work, preliminary results suggest that if the movement requires selective recruitment of specific muscles, there is a decrease in engagement of this diffuse pathway, which could be an indication that the motor cortices suppress the brainstem to ensure selectivity during the movement.

## **3) How have you benefited from your membership in ASNR and receipt of the Diversity Fellowship Award?**

As an ASNR member, I had the opportunity to present a poster at the ASNR 2023 conference in Charleston, South Carolina. I enjoyed discussing my work in a small, tightly focused group with experts in this field. I also had the opportunity to view the amazing work of other scientists and engineers. This was made financially easier because of the Diversity Fellowship Award.

## **4) What are your longer term career goals?**

One of my goals is to become a researcher, collaborating with experts in the field of engineering and neuroscience, to understand the neuro-pathophysiology of neurological diseases such as stroke. As a researcher, I also seek to develop translational interventions or devices, applicable to mitigate the effects of motor deficits and improve the quality of life of individuals with disabilities.

Secondly, it has always been one of my career objectives to bridge the opportunity gap that developing countries face. As such, after my PhD, I hope to contribute my quota to the improvement of healthcare in developing countries – particularly in the rehabilitation field. With the skillset and knowledge gained from my PhD, I will endeavor to make novel science-underpinned rehabilitation therapies, that complement existing strategies, available for use in

developing nations to improve the quality of life of individuals with neural injuries. As such, I am excited about being a member of the ASNR community as this will only increase my network and the international impact of my work. This network will foster collaborations that seek to improve of delivery of state-of-the-art healthcare to developing nations.

You can [connect with Trudy on LinkedIn](#) to learn more and follow her work.