Olga Vafaeva is a fourth year PhD student in the lab of Dr. Elva Diaz at the University of California, Davis. Olga was introduced to research while completing a bachelor’s in chemistry at Hunter College. She has worked on multiple projects at the Albert Einstein College of Medicine, University of California, San Francisco, and the University of Groningen studying mechanisms of neural development and regeneration. These experiences fostered her love for research and helped to discover her interest in molecular neuroscience which Olga further pursued in her graduate studies. For her thesis, Olga investigates mechanisms controlling generation and integration of new neurons in the aged brain. Olga hopes to pursue a career in academia to develop therapeutic interventions for age-related memory deficits and cognitive decline.

Olga Vafaeva FY 2021-22 Award Recipient

The Ling-Lie Chau Graduate Student Award for Brain Research enabled Olga to attend the CAJAL Advanced Imaging Techniques for Cellular and Systems Neuroscience course at the University of Bordeaux in France, where she received a unique opportunity to develop comprehensive, high-level understanding of microscopy and imaging. Olga was able to gain a solid experimental foundation for her graduate research and is an important steppingstone for the success of her thesis project.
I was thrilled to receive the Ling-Lie Chau Graduate Student Award for Brain Research, and I deeply appreciate your support. Thanks to your generous gift, I had an amazing opportunity to attend the Advanced Imaging Techniques for Cellular and Systems Neuroscience course at the University of Bordeaux in France. The training program brought together leading experts in developing and applying cutting-edge imaging techniques from around the globe and was extremely beneficial for me. I am incorporating the skills I learned in my current and future research.

Attending this course empowered me with both theoretical and experimental knowledge of imaging techniques that is necessary to achieve the proposed aims of my thesis. Through lectures and seminars given by invited speakers and extensive hands-on training, I increased my conceptual understanding of the principles of fluorescence microscopy, image recording, and data analysis. As a result, I feel more confident in planning my experiments, and I can take full advantage of the imaging facility at UC Davis.

In fact, I am using one of the super resolution techniques that I learned in this course —STochastic Optical Reconstruction Microscopy (STORM)—in my project. This technique allows researchers to spatially resolve the localization of individual molecules and produces high-quality images of cellular components with precision under 20 nanometers. In my research project, this method is useful to visualize individual proteins within neuronal connections that are very compact structures (between 1 to 10 microns) with complex morphology. I’m studying previously unreported proteins Synaptic Differentiation Factor 1 and 4 (SynDIG1 and SynDIG4) in formation of neuronal connections in the adult brain. Using this method, we aim to determine the exact location of these proteins within neurons and begin to address more mechanistic questions about their role in formation and regulation of neuronal connections. These data will be critical for my dissertation project.

The CAJAL advanced neuroscience training program was an unparalleled experience and an excellent networking opportunity. I enjoyed meeting other scientists, trainees, and potential collaborators and learning from researchers from all over the world. The training I received will help me to design more rigorous experiments, which will enable me to produce high-quality, reproducible quantitative data. The knowledge and skills I acquired in this course will help me execute my research that will broaden the current understanding of the cellular properties that regulate development and integration of newborn neurons later in life.

I greatly appreciate the opportunity you provided me, and I am extremely grateful for your generosity!

Sincerely,

Olga Vafaeva