The 2024 Science Olympiad Alumni Research (SOAR) Grant Winner for
Medical Research Impacting Human Health

Nikki Cheung
University of California, Los Angeles
Biochemistry, Biophysics and Structural Biology

Nikki Cheung is a graduate student researcher in the Clubb Lab at UCLA's Department of Chemistry and Biochemistry. Nikki has been involved with Science Olympiad for nearly a decade as a competitor, event supervisor and test writer. "As a student at an arts-based high school, Science Olympiad helped me find my passion for science and encouraged me to pursue a higher degree in STEM."

Nikki's current work tackles human infection, disease transmission and pathogen evolution. Antibiotic-resistant bacteria continues to be a detriment to human health, causing more than 2 million illnesses and 23,000 deaths annually in the United States. The Centers for Disease Control and Prevention (CDC) projects that related fatalities from antibiotic resistance will exceed cancer-related deaths by 2050, underscoring the need for innovative solutions.

Using hair-like protein chains anchored on the surface of cells which function in host adhesion and invasion, Nikki has developed a novel strategy to disarm these pili and limit the virulence of pathogenic bacteria. Her work seeks to solve the atomic structure of pili to better understand their versatility and develop novel inhibitors to treat infections.

Dr. Robert Clubb, Professor of Chemistry and Biochemistry at UCLA, explains two aims for Nikki's project: one, to determine how enzymatic machinery that builds the pilus is assembled; and two, to develop a complementary cell-based assay to dissect the mechanism. He notes Nikki has already made major strides toward developing a fluorescence-activated cell sorting (FACS) approach to detect pilus display.

The $25,000 SOAR Grant will support instrumentation usage and data collection using the Cryo-EM technique, as well as lab supplies, microscope training, sample production, sample screening and grid preparation.

Nikki loves the camaraderie of Science Olympiad and takes part in group activities up and down the California coast like mentoring students in the Urban Schools Initiative, assisting with invitational, state and national tournaments and even making sushi with the UCLA Science Olympiad Alumni Club. She plans to continue her service and community outreach as she pursues a career as a scientist, scholar and teacher.

The Science Olympiad USA Foundation is a nonprofit organization founded in 2020, dedicated to carrying out the charitable, educational and scientific purposes of Science Olympiad, Inc., a nonprofit formed in 1984. This year, two first-place $25,000 SOAR Grants and two $10,000 runner-up SOAR Grants were awarded in each category of medical research impacting human health and energy/climate research impacting a safer, greener world.