Li Liao, PhD Candidate, Laboratory of Dr. Jae Hong Park

February Spotlight

Li Liao is a PhD candidate in the Occupational and Environmental Health Science Program. After receiving her master's degree in Food Science at the Illinois Institute of Technology, she joined Dr. Jae Hong Park’s lab in 2018. Her research has been focused on the development of samplers combined with rapid analysis methods of bioaerosols.

Bioaerosols are defined as aerosol particles of biological origins (e.g., bacteria, viruses, fungi, etc.). They are ubiquitous in ambient environments and associated with adverse health effects including infectious diseases, acute toxic effects, and allergies. The recent pandemic of Coronavirus Disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can also transmit in the form of bioaerosols. To prevent or control people’s exposure to bioaerosols, measuring their concentration would be a critical step. Current methods involve the collection of bioaerosols into media by samplers (e.g., impactors, cyclones, impingers) and quantification through colony counting or quantitative polymerase chain reaction. However, these conventional methods require the correct selection of sampling media and extended time for the transportation of samples to laboratories, incubation, and subsequent analysis. These limitations should be overcome for the timely exposure assessment in the field. Therefore, she has developed new bioaerosol samplers that can be combined with swab based analysis methods such as adenosine triphosphate (ATP) bioluminescence assay for measuring the bioaerosol concentration and immunochromatographic assay to detect pathogenic bioaerosols. Recently, her first research article titled “Development of a size-selective sampler combined with an adenosine triphosphate bioluminescence assay for the rapid measurement of bioaerosols” was published in Environmental Research. She also presented her research at national and international conferences and received several awards. She won both the first place “Best in Show” award as well as the Ken Dillon award at the virtual American Industrial Hygiene Conference and Exposition (AIHce) in June 2020. In addition, her proposal titled “Development of a Sampler for the Rapid and Convenient Detection of Airborne Pathogens” has been recommended for funding of $20,000 by the Center for Occupational Safety and Health Engineering, University of Michigan.

In addition to her research achievements, she has a remarkable dedication to providing services related to the promotion of occupational and environmental health. She is a Vice President of the Purdue Industrial Hygiene Student Association (PIHSA). She is a member of the American Industrial Hygiene Association (AIHA) and the American Society of Safety Professionals (ASSP). She has served as a student representative at meetings of the external advisory board for the OEHS program. She has worked as a teaching assistant for undergraduate and graduate classes in the School of Health Sciences for two years.