Research Seminar

Dr. Connie Wu
Harvard University

“Tackling Disease-Associated Biomolecules: From RNA Therapeutics to Single Molecule Detection”

Abstract

The identification and therapeutic targeting of disease-associated biomolecules have been bolstered by considerable advances in nanotechnologies and analytical tools. However, biological heterogeneities, physiological barriers, and insufficient analytical sensitivities remain critical obstacles for many therapeutic and diagnostic applications. My work has encompassed nanoscale and microscale technologies for addressing these challenges in both targeting and probing disease-associated biomolecules. I will first describe the design of a highly potent small interfering RNA nanoparticle delivery system that leverages approaches in nucleic acid engineering and polymer chemistry. Towards overcoming analytical barriers in clinical diagnostics, I will then present the development of an ultrasensitive digital enzyme-linked immunosorbent assay (ELISA) platform that can detect attomolar (10⁻¹⁸ M) protein concentrations, with over four orders-of-magnitude improvement in sensitivity over conventional protein detection methods. In addition, I will highlight clinical applications of ultrasensitive digital ELISA technologies in measuring new blood-based biomarkers for cancer detection. My future work will integrate materials and analytical approaches for developing new diagnostic and predictive tools to improve early cancer detection and advance personalized medicine.

Biography

Connie Wu is an NIH F32 Ruth L. Kirschstein postdoctoral research fellow in Dr. David Walt’s lab at Brigham and Women’s Hospital and the Wyss Institute for Biologically Inspired Engineering at Harvard University. She obtained her B.S. in chemical engineering from Yale University, where she worked with Dr. Paul Van Tassel in designing porous layer-by-layer polymer films for tissue engineering applications and received a Barry M. Goldwater Scholarship. Connie pursued her Ph.D. in chemical engineering at MIT, working in Dr. Paula Hammond’s lab on polymer-based RNA interference delivery systems for cancer therapeutics. She was the recipient of multiple fellowships during her Ph.D. training, including an NSF Graduate Research Fellowship, Ludwig Center for Molecular Oncology Graduate Fellowship, and MIT Presidential Fellowship. In her current postdoctoral work, Connie has developed ultrasensitive diagnostic platforms based on single molecule detection for point-of-care and biomarker discovery applications.

Thursday, April 15, 2021
12:00 p.m. – 1:00 p.m.

Register in advance for this meeting:
https://psu.zoom.us/meeting/register/tJAsdeqprTstEtSVFkXDp76X9FiGQmCBX6g

After registering, you will receive a confirmation email containing information about joining the meeting.

For additional details call Diane K. Bierly 863-6491