



Chemical & Physical Sciences

UNIVERSITY OF TORONTO

MISSISSAUGA

COLLOQUIUM SEMINAR SERIES

MICRO- AND NANOSCALE TOOLS FOR SYSTEMS BIOLOGY



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My group drives technological innovations in microfluidics, nanoscience, and bioimaging for high resolution profiling of complex biological systems. Microfluidics enables high throughput analysis of individual cells, viruses, and molecules while imaging technologies probe the spatial architecture of cellular and molecular landscapes. Using the new platforms, we aim to establish a mechanistic understanding of how individual biological components (molecules, viruses, or cells) drive systems of vast complexity (virus evolution, tissue functions, or population behaviors). In this talk, I will introduce the new microfluidic tools we have been developing to achieve single virus genomics as well as the imaging tools for in situ analysis of transcriptomics. Single virus sequencing allows comprehensive profiling of the mutational landscape and quantitative assessment of the key processes impacting virus evolution. With these capabilities, the single virus sequencing technology will serve as an important foundation for quantitative modeling of virus evolution. Imaging-based spatial transcriptomics profiles the transcriptional profile of individual cells while retaining the positional information of each RNA molecule. We are using this platform to identify the cellular or molecular mechanisms underlying systems-level functions in healthy and diseased tissues. The potential of these technologies for systems medicine will also be discussed.

Colloquium Seminar Series

Wednesday, January 26, 2022

Join us on Zoom at 3:10pm

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