

SEVAHN VORPERIAN**"Molecular Microscopy with
Single Cell Transcriptomic
Data Resolves RNA
Liquid Biopsies"**

Wednesday

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3:30 PM

Wu and Chen Auditorium

Levine Hall

PhD Candidate
Chemical Engineering
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Invasive biopsy is the gold standard for diagnosing several diseases; however, these procedures offer a limited, localized view of the disease pathology to the physician and are not risk-free to the patient. Cell-free RNA (cfRNA) in blood plasma reflects dynamic gene expression changes and can facilitate early disease diagnosis, yet current cfRNA assays fall short of the cellular resolution afforded by an invasive biopsy. In this talk, I will first resolve plasma cfRNA at cell type resolution using single cell transcriptomic data alongside approaches from machine learning and data science, which enable a systems-view into the underlying molecular patterns within these high-dimensional biological data. I will then describe how this molecular microscope can noninvasively reflect changes observed in invasive biopsy across various diseases and facilitate the study of biofluids beyond the blood. These findings expand the achievable resolution within the RNA liquid biopsy biomolecular repertoire and broaden opportunities in precision medicine for complex diseases in hard-to-biopsy tissues.

BIO

Sevaht Vorperian is a final-year doctoral candidate in the Department of Chemical Engineering at Stanford University. In the laboratory of Professor Stephen Quake, Sevaht built computational models and performed wet lab experiments to expand the achievable resolution of RNA liquid biopsies, where her doctoral work reflects one of the first translational applications of single cell transcriptomic data. Sevaht is supported by a National Science Foundation Graduate Research Fellowship, the Benchmark Stanford Graduate Fellowship, and the Sarafan ChEM-H Chemistry-Biology Interface Training Program. Sevaht graduated magna cum laude from Columbia University in the City of New York with a Bachelor of Science in Chemical Engineering.