

Stanford Postdoctoral Research Fellow – microfluidics, nanofabrication & spatial proteomics

Two postdoc positions in the lab of Prof. [Sindy Tang](#) are immediately available in the areas of microfluidics, nanofabrication, and spatial proteomics.

Project description

The spatial organization of proteins within biological tissues plays a critical role in the normal functioning of the tissue and disease development. The goal of this NIH-funded project is to develop a high throughput and scalable technology to perform tissue microdissection that preserves tissue spatial information and couples directly to established LC-MS/MS workflow for deep and unbiased spatial mapping of the proteome. Our approach integrates a novel tissue [micro-dicing device](#), a nanodroplet sample preparation platform for LC-MS/MS analysis with single-cell sensitivity, and novel microfluidic device to transfer the diced tissue pixels while preserving their spatial order. This position will allow exciting opportunities to collaborate with the Pacific Northwest National Lab and the Stanford School of Medicine.

The project is expected to accelerate MS-based spatial proteomics for deep and unbiased mapping of tissue heterogeneity down to single-cell resolution, thereby accelerating biomedical research and clinical diagnostics towards a better understanding of the role of tissue heterogeneity in pathophysiology, such as the role of the tumor microenvironment on cancer initiation and progression. The deep and unbiased proteome coverage will enable the discovery of novel protein biomarkers and molecular pathways to identify new therapeutic targets, which would be difficult using antibody-based approaches. Our ability to quantitatively map ECM and secreted proteins will facilitate the elucidation of the role of ECM, such as their remodeling, in disease progression. Finally, while this project focuses on spatial proteomics, we expect our technology and workflow to be extended to other biomolecules that LC-MS/MS can readily measure, such as lipids and metabolites, thereby opening the opportunity for spatial multi-omic measurements in future studies.

Skills useful for this project include:

- Microfluidics design and integration, and related areas
- Micro- and nanofabrication, e.g., silicon micromachining, high resolution 3D printing (e.g., Nanoscribe)
- Experience working with biological samples (tissues)

Application

For questions or applications (see below), please feel free to reach out to Prof. Sindy Tang (sindy@stanford.edu).

Application: please email in a single PDF including:

- CV with publication list
- A 1/2 to 1-page summary of research accomplishment, why you are interested in this project, and your expected contributions
- Contact information of 3 references
- Links to 3 representative papers