

## Stanford Research Fellow – Label-free cytometry for food allergy diagnostics

Two positions in the lab of Prof. [Sindy Tang](#) are immediately available in the areas of microfluidics, immunomagnetic cell isolation from whole blood, impedance cytometry, mechatronics.

### **Project description**

[Food allergy](#) has reached epidemic proportions. The increasing prevalence of food allergy has become a serious public health concern. Every food allergy has the potential to be life-threatening. Nevertheless, current food allergy tests are inadequate. The gold standard for food allergy assessment is an oral food challenge (OFC). It is often not performed as it places the patient at risk of anaphylaxis. Other conventional food allergy tests, such as skin prick tests and serum IgE, are safer and more accessible than OFC, but they do not always predict a true allergic reaction and have high false positive rates. As such, there is a *critical unmet need* for food allergy tests that are accurate and safe, and ideally, are also rapid and accessible to reduce the incidence of adverse reactions due to delayed diagnosis or misdiagnosis.

Our *goal* is to address this unmet need by developing and validating a blood cell activation test for accurate, safe, and accessible food allergy diagnostics by developing a microfluidic label-free cytometer. This project is in close collaboration with the world-class clinical research units at the Stanford [Sean N. Parker Center for Allergy & Asthma Research](#). If successful, we envision that our method will complement or even replace current diagnostic approaches, and significantly reduce the number of oral food challenges needed. The impact is significant as it is expected to markedly lower the number, and the associated medical costs, of adverse allergic reactions due to delayed diagnosis of food allergy or misdiagnosis. Our work has additional potential impact to better track treatment efficacy, and accelerate the validation of new food allergy treatments.

Skills and background useful for Position 1:

- Experience on microfluidic immunomagnetic separation of cells (highly desired)
- Microfluidics design and integration, and related areas
- Microfabrication and prototyping, e.g., photolithography, soft lithography, 3D printing
- Experience working with blood

Skills and background useful for Position 2:

- Experience with microfluidic impedance cytometry (highly desired)
- Electronics / Mechatronics
- Machine learning
- Microfluidics design and integration, and related areas
- Microfabrication and prototyping, e.g., photolithography, soft lithography, 3D printing
- Experience working with blood

### **Application**

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

Application: please email in a single PDF including:

- CV with publication list and any relevant experiences
- A 1/2 to 1-page summary of research accomplishment, why you are interested in this project, why you think you are a good fit, and your expected contributions