

# INTERNATIONAL MICROFLUIDICS CONGRESS

## &

### International Conference on

# ADDICTION RESEARCH AND THERAPY

August 13-14, 2018  
San Diego, USA

### **An integrated droplet-based platform for classification of lymphocyte activity and functional phenotyping at single cell level**

Tania Konry, Saheli Sarkar, Pooja Sabhachandani and Seamus Mckenney  
Northeastern University, USA

Functional heterogeneity is inherent in immune cell populations due to intrinsic stochasticity in environmental cues, transcription and translation. Studying immune cell heterogeneity on a single cell level in real-time, dynamic analysis is crucial to understanding how different immune interactions contribute to immunological processes and cancer immunology. Current techniques used to study single immune cells and interactions, such as flow cytometry, fail to capture and analyze this extensive diversity. Microfluidics has rapidly emerged as a new platform capable of performing high throughput, single cell analysis in real time on several types of cell populations. Our group has developed a robust droplet microfluidic platform

capable of isolating single cells and pairs of single cells that can be analyzed in real time and in high throughput. We have utilized this platform to enhance current knowledge in a multitude of immunological applications, including single immune cell analysis, immune cell interactions, and immune-cancer interactions at the single cell level. Our approach serves as a “bottom-up” method of classification, by first identifying distinct functional categories and then probing the content of the individual cell category to determine the key factors for the molecular classification of heterogeneous immune functions of immune cells related to target cell kill.

t.konry@neu.edu