

## **Microfluidic Platform for Bead-based Single Cell Protein Measurement**

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Single cell analysis is an important technique used for understanding cellular signaling pathways, heterogeneity and immune function. Proteins such as cytokines and transcription factors play a critical role in the immune system, yet cellular heterogeneity and protein correlations are still not well understood. Bead-based methods for protein detection [1] are of interest because they are compact, versatile, have high signal density and high multiplex space due to internal spectral barcodes. However, bead manipulation on chip is difficult and not easily scalable due to sorting time [2]. We developed a novel microfluidic sorter, utilizing individually releasable hydrodynamic traps, for quick and accurate addressing of beads to assay chambers. Cells were then loaded to chambers and immunoassays were performed on lysed or secreted samples. Software was built to integrate the microfluidic device, microscope and camera and allowed fully automated bead sorting and experimentation. Data analysis tools were also developed to analyze protein measurements.

### References:

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