

Abstract Submitted
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Detection of Kinase Translocation Using Microfluidic Electroporative Flow Cytometry CHANG LU, JUN WANG, NING BAO, LEELA PARIS, HSIANG-YU WANG, ROBERT GEAHLEN, Purdue University, West Lafayette, IN, BIOLOGICAL ENGINEERING COLLABORATION, PHARMACY COLLABORATION — Translocation of a protein between different subcellular compartments is a common event during signal transduction in living cells. Detection of these events has been largely carried out based on imaging of a low number of cells and subcellular fractionation/Western blotting. These conventional techniques either lack the high throughput desired for probing an entire cell population or provide only the average behaviors of cell populations without information from single cells. Here we demonstrate a new tool, referred to as microfluidic electroporative flow cytometry, to detect the translocation of an EGFP-tagged tyrosine kinase, Syk, to the plasma membrane in B cells at the level of the cell population. We combine electroporation with flow cytometry and observe the release of intracellular kinase out of the cells during electroporation. We found that the release of the kinase was strongly influenced by its subcellular localization. Cells stimulated through the antigen receptor have a fraction of the kinase at the plasma membrane and retain more kinase after electroporation than do cells without stimulation and translocation. This tool will have utility for kinase-related drug discovery and tumor diagnosis and staging.

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