

Abstract Submitted  
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**Single-cell Genomics using Droplet-based Microfluidics** ANINDITA BASU, SEAS, Harvard University; Broad Institute of MIT and Harvard, EVAN MACOSKO, HMS, Harvard University; Broad Institute of MIT and Harvard, ALEX SHALEK, FAS, Harvard University; Broad Institute of MIT and Harvard, STEVEN MCCARROLL, HMS, Harvard University; Broad Institute of MIT and Harvard, AVIV REGEV, Dept. of Biology, Massachusetts Institute of Technology; Broad Institute of MIT and Harvard, DAVE WEITZ, School of Engineering and Applied Sciences/Department of Physics, Harvard University — We develop a system to profile the transcriptome of mammalian cells in isolation using reverse emulsion droplet-based microfluidic techniques. This is accomplished by (a) encapsulating and lysing one cell per emulsion droplet, and (b) uniquely barcoding the RNA contents from each cell using unique DNA-barcoded microgel beads. This enables us to study the transcriptional behavior of a large number of cells at single-cell resolution. We then use these techniques to study transcriptional responses of isolated immune cells to precisely controlled chemical and pathological stimuli provided in the emulsion droplet.

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