Analyzing Cancer at Single Cell Resolution with Droplet Technology

**Abstract**

Cancerous cell growth can result from mutation of the underlying genome or from aberrant epigenetic regulation, shifting transcript and protein expression levels and causing uncontrolled growth. The resulting tumors are often composed of heterogeneous mixtures of both clonally transformed tumor cells and other cell types. Here we describe extensions of our novel microfluidic technology that enable analysis of a DNA sample’s methylation and allele detection of genetic variants in heterogeneous mixtures. We also present unique capabilities for capturing both phenotypic and genotypic information from droplet-encapsulated individual cells, enabling analysis of tumors with single-cell resolution.

**Targeted Sequencing of Cancer Gene Networks**

**Droplet Methyl-Seq With Bisulfite Treated DNA**

**Enrichment of Resequencing Targets**

**Sequencing of Heterogeneous Samples**

**Summary**

- **Targeted Sequencing**
  - The RDT 1000 droplet-based PCR Library Prep Kit provides >95% coverage, and high accuracy for discovery and validation of genomic and epigenomic variation in gene networks.
  - Droplet Single-Cell Genomics (DSCG)
    - Enabling genome and transcriptome sequencing from single cells
    - Single-cell enrichment and non-invasive analysis of phenotypic, genetic and transcriptomic variation, and analysis by sequencing, digital PCR or other widely accepted genomic methodology.