

# The smart choice for single cell transcriptomics: Element<sup>®</sup> AVITI<sup>™</sup> System plus the HIVE<sup>™</sup> scRNAseq solution.



For research use only. Not for use in diagnostic procedures.

## Maximize your sequencing dollars even further

The HIVE<sup>™</sup> Single Cell RNAseq Solution can quickly generate single cell data from your precious samples. Even with the significant cost savings built into the HIVE, single cell experiments can be expensive for the time & capital required to collect samples, prepare libraries, & conduct next-generation sequencing. For many users, cell enrichment kits & low-cost sequencing are smart options to further reduce costs.

We show here that the HIVE<sup>™</sup> scRNAseq solution is compatible with STEMCELL<sup>™</sup> EasySep<sup>™</sup> cell enrichment kits<sup>1</sup> and the Element AVITI System benchtop sequencer.<sup>2</sup> When targeting a specific cell type in your sample, enrichment kits can remove background cells and concentrate your target to maximize meaningful reads. The AVITI offers high quality sequencing data at a budget price tag, saving your sequencing dollars.

## Enrichment and sequencing technologies

### STEMCELL EasySep cell enrichment

- Enriches specific cell types via immunomagnetic separations (positive and/or negative)
- Supports applications with >120 kits available
  - Works with PBMCs and dissociated tissues

### Element AVITI System benchtop sequencer

- Lowers run costs for everyday sequencing<sup>3</sup>
  - \$2-5 per Gb
  - \$0.6-1 per million reads
- Offers seamless library prep compatibility<sup>4</sup>
  - Supports linear libraries from third-party kits
  - Simple workflow complete in ~40 minutes
- Minimizes common PCR errors<sup>5</sup> with rolling circle amplification-based Avidity Sequencing™

## Study parameters

### PBMC samples

- Controls: Fresh, unprocessed human PBMCs
- Samples: PBMCs enriched for T cells
  - EasySep™ Human CD3 Positive Selection Kit II from STEMCELL Technologies<sup>1</sup>

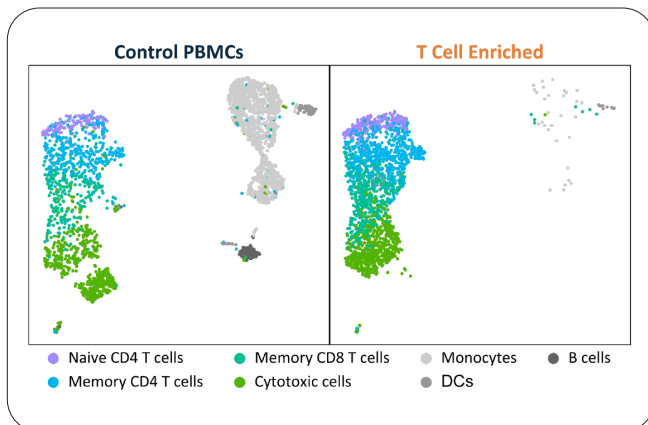
### HIVE™ single cell processing

- HIVE Sample Capture & Processing protocol (v1)
  - All conditions were repeated in triplicate

### AVITI™ sequencing

- Converted HIVE libraries for AVITI sequencing<sup>2</sup>
  - Adept Library Compatibility Kit from Element<sup>6</sup>
- Sequenced with Honeycomb's custom primers

### UMAP plots from HIVE Single Cell RNAseq



## T cell enrichment for the HIVE

### High quality clustering with HIVE RNAseq

- All UMAP plots clustered by cell type with T cells separated from monocytes, DCs, & B cells

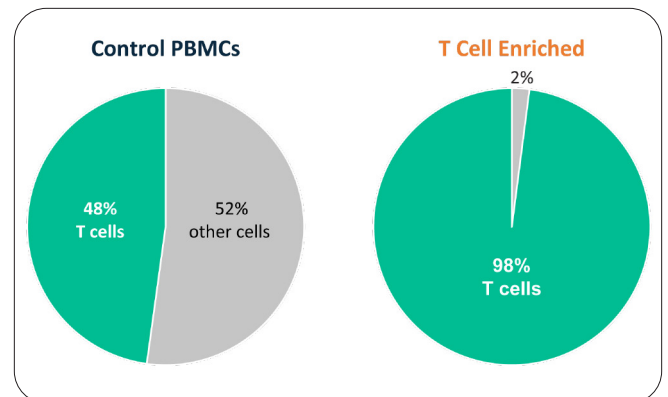
### Concentrating target cells saves sequencing dollars

- T cell purity increased from 48% to 98%
- EasySep excluded off-target PBMCs
  - Depleted monocytes & DCs
  - Eliminated B cells

### Robust & consistent gene expression profiles

- Expression profiles were stable after enrichment
  - Even for the few remaining monocytes & DCs

### Performance for T cell enrichment

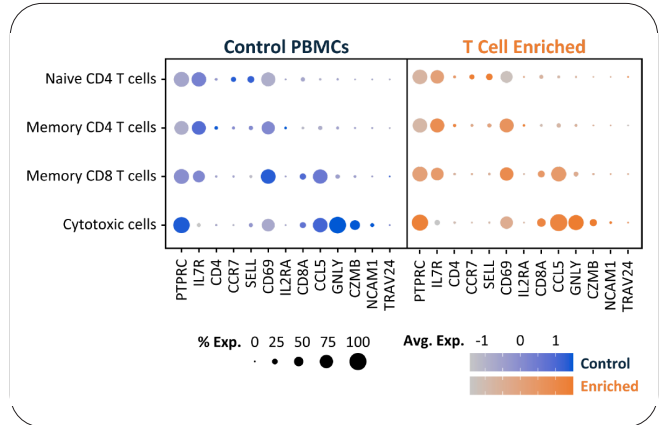


## Single cell sequencing with AVITI

### AVITI sequencing performance

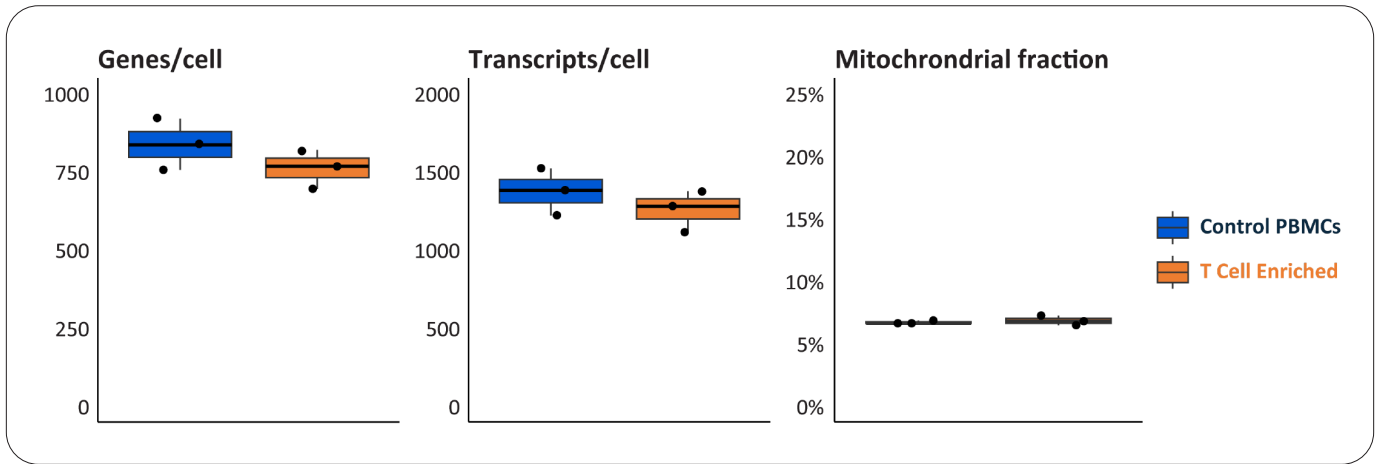
- Very high call accuracy with few read errors
  - Q30% was >98% for Reads 1 & 2
- Minimal index hopping
  - 98.2% index assignment
  - 0.07% unexpected pairs
- Base composition matches expected HIVE chemistry
  - Poly(A) tailing reduced base complexity in Read 1
  - GG sequence feature in HIVE library in Read 2

### Robust & stable gene expression profiling

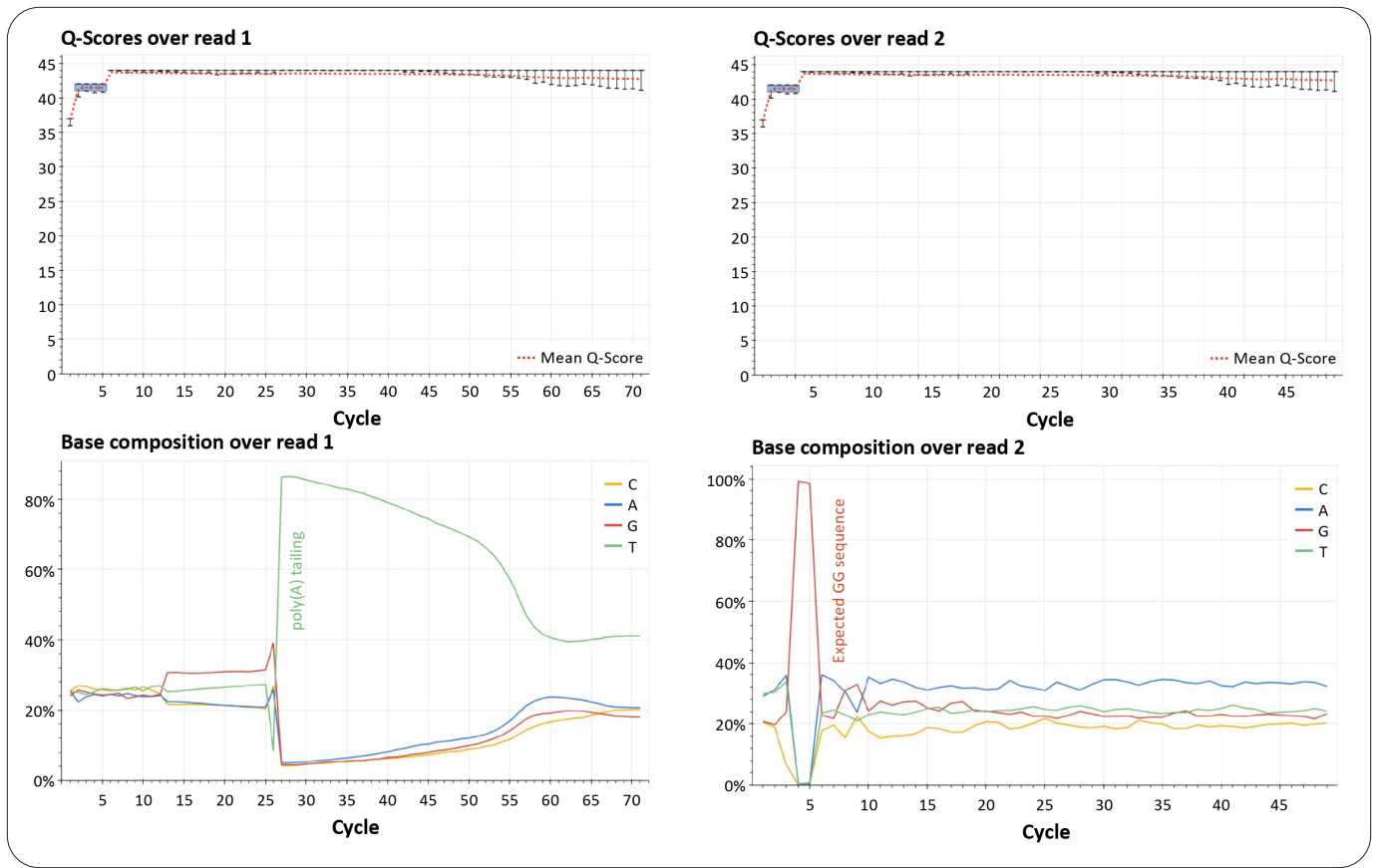


Dot plot of marker genes in control (left) and T cell enriched (right) samples

## Single cell quality metrics for shallow sequencing (<10,000 reads/cell)



Single cell sequencing metrics from three replicates, for median number of genes detected (left), median transcripts (middle), and median fraction of mitochondrial transcripts (right)



AVITI flow cell quality metrics for sequencing Q-scores (top) and base compositions (bottom) for read 1 (left) and read 2 (right)

## References

1. EasySep™ Human CD3 Positive Selection Kit II. STEMCELL Technologies Inc. <https://www.stemcell.com/products/easysep-human-cd3-positive-selection-kit-ii.html>
2. AVITI sequencer. Element Biosciences Inc. <https://www.elementbiosciences.com/products/aviti>
3. AVITI pricing. Element Biosciences Inc. <https://www.elementbiosciences.com/products/aviti/pricing>
4. Compatible Kits for the Element Adept™ Library Compatibility Workflow. Element Biosciences Inc. <https://www.elementbiosciences.com/resources/compatible-kits-adept-library>
5. Avidity Sequencing™. Element Biosciences Inc. <https://www.elementbiosciences.com/technology/avidity-sequencing>
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