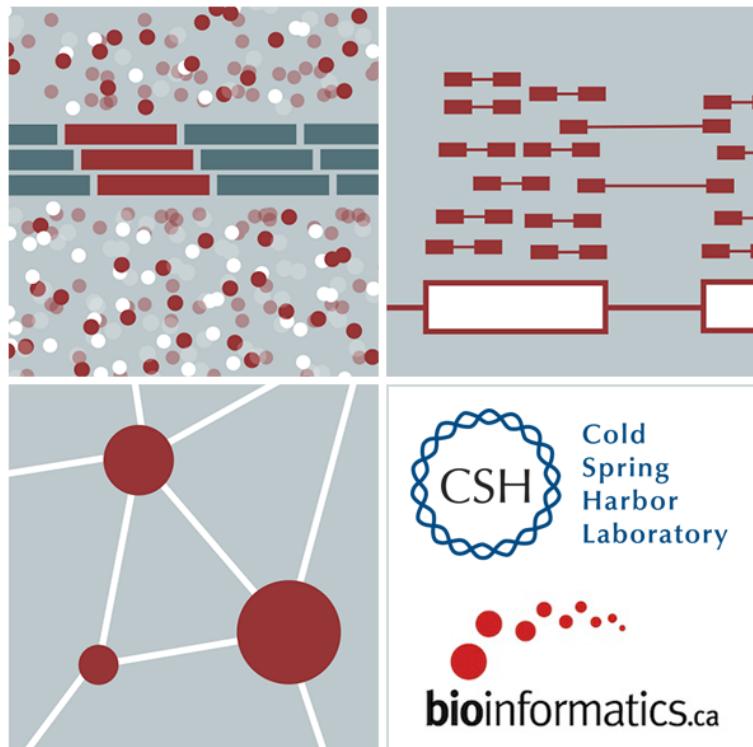


RNA-Seq workshop

Single Cell RNA-sequencing

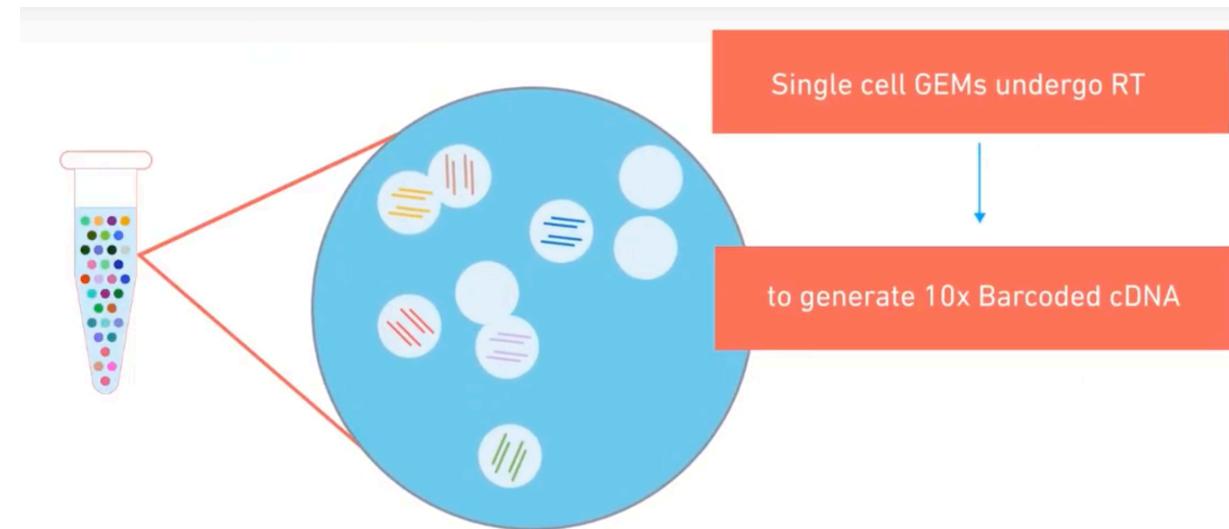
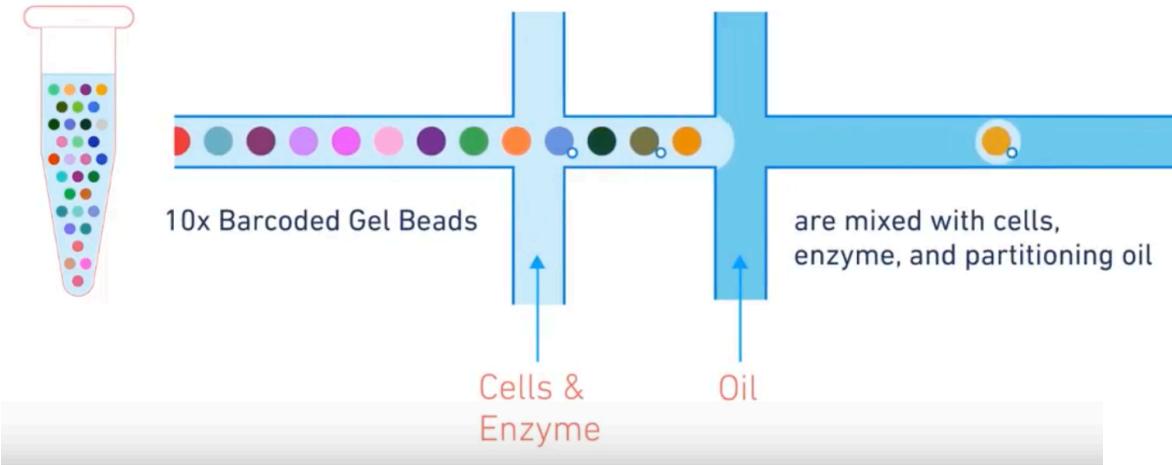
Kelsy Cotto, Malachi Griffith, Obi Griffith, Chris Miller,
Megan Richters



Single Cell RNA-sequencing

- Single cell sequencing is not new
- Doing it for a reasonable cost, at scale is

Library preparation and Sequencing



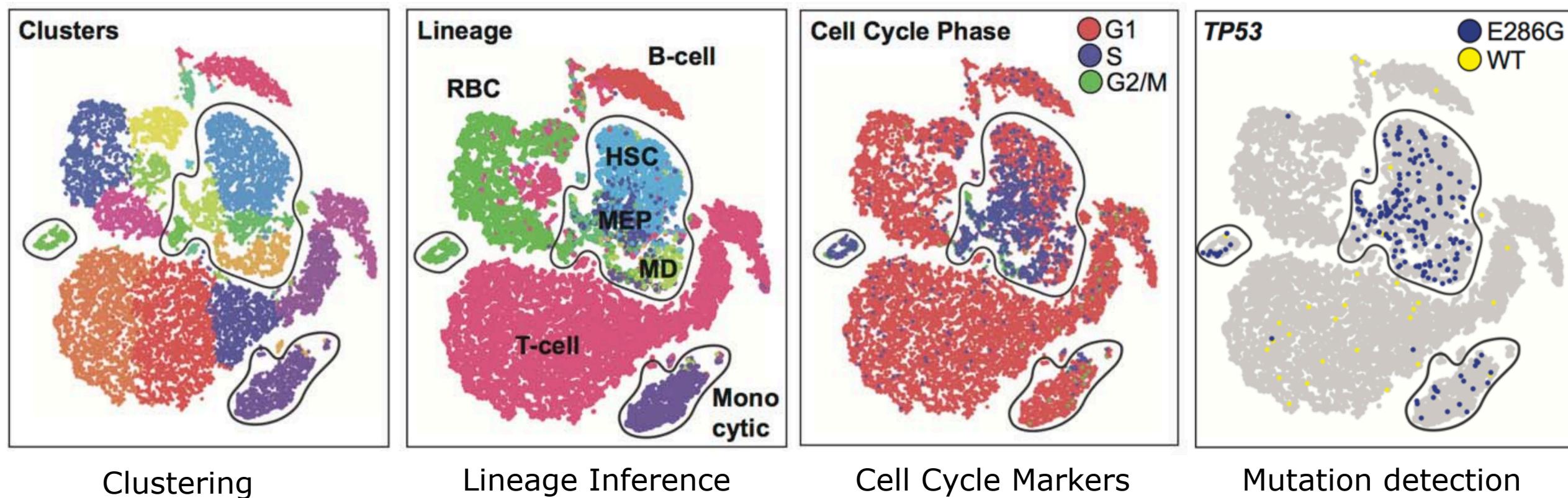
- Cells are captured in oil droplets
- Reactions in the droplets create the library and amplify it
- cDNA is collected and sequenced

<https://www.10xgenomics.com/solutions/single-cell/>

Sequence data

- Aligned with CellRanger (uses STAR under the hood)
- Each read contains a pair of barcodes:
 - Cell Barcodes (CB) - Reads came from the same cell
 - UMI Barcodes (UB) - Reads came from the same molecule
- Data is quite sparse
 - not every transcript is detectable in every cell

Single Cell Analyses



Clustering

Lineage Inference

Cell Cycle Markers

Mutation detection

- Still a rapidly evolving field, but a few popular packages include CellRanger, Seurat, Monocle, CONICS, many more

<https://github.com/seandavi/awesome-single-cell>

Petti, et al. doi:10.1101/434746