

Introduction to scRNA-seq Data Analysis

7/20/2022

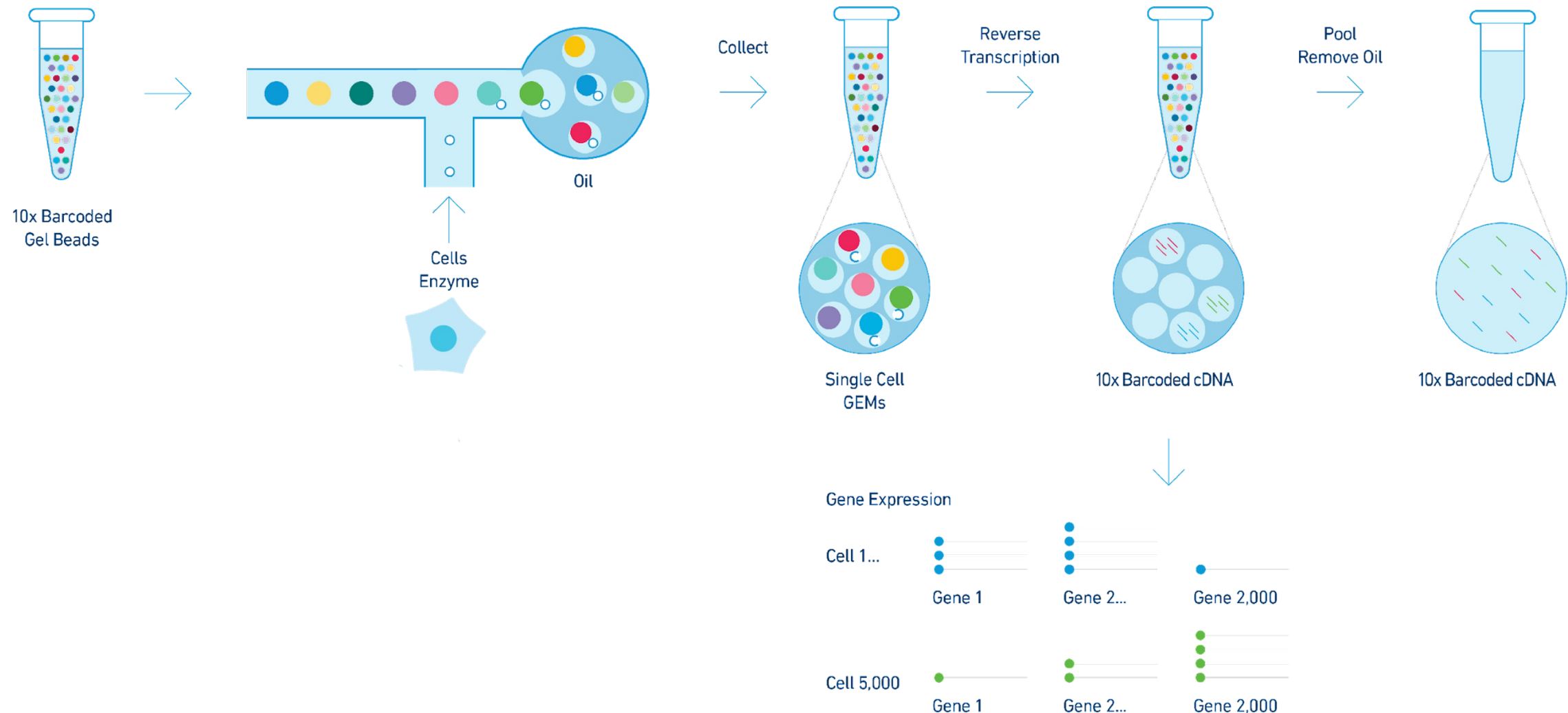
Hands on tour of the single cell analysis journey

Outline

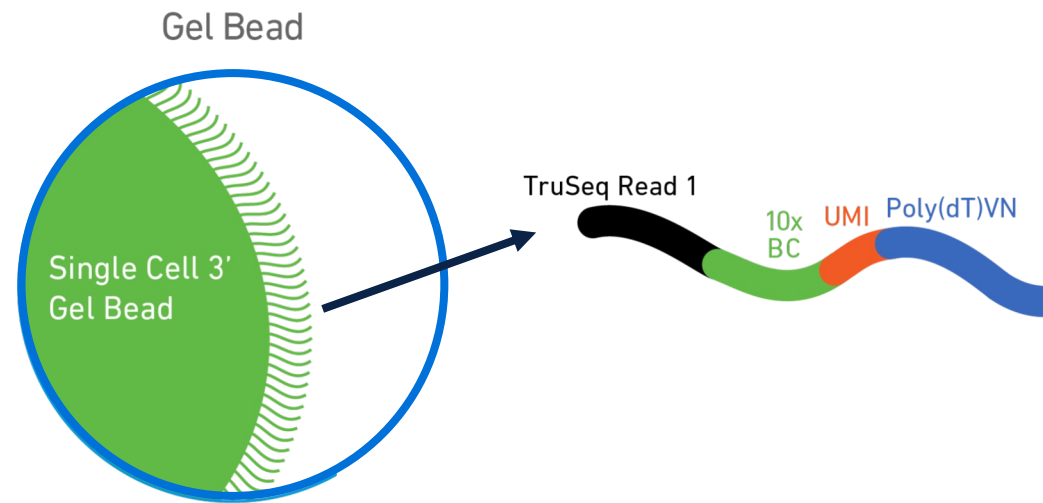
- Introduction to scRNA-seq
- Overview of Cell Ranger
- Where are we in our neutrophil analysis

Introduction to scRNA-seq data analysis

10x Genomics 3' Single Cell Gene Expression Assay

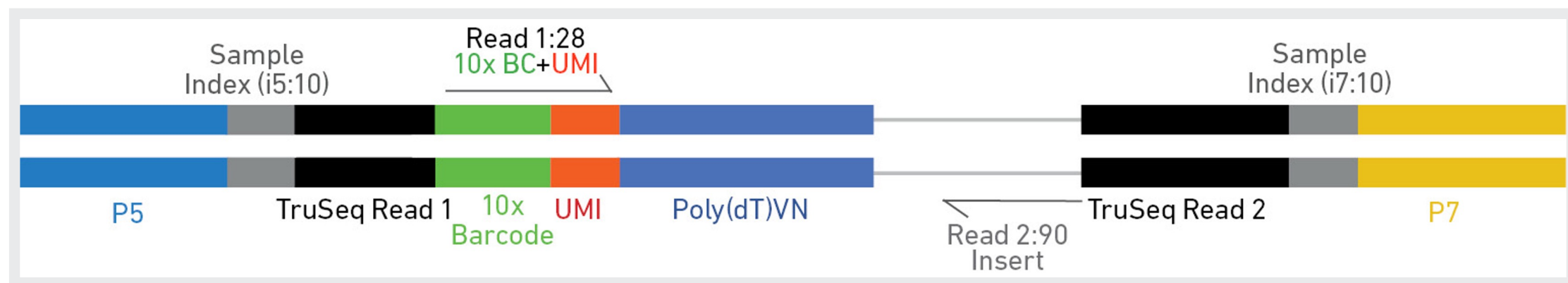


3' Single cell gene expression



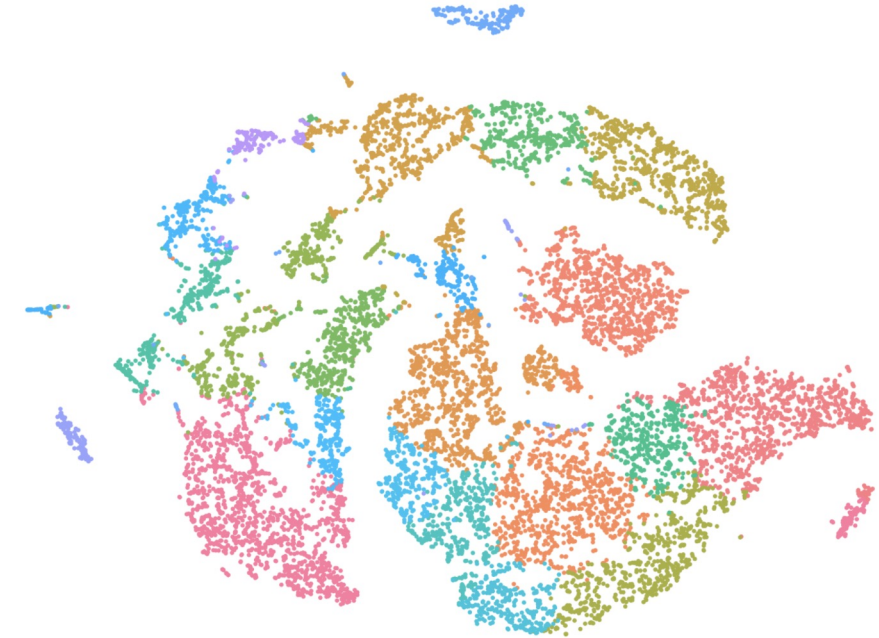
Read structure

Single Cell 3' Gene Expression library



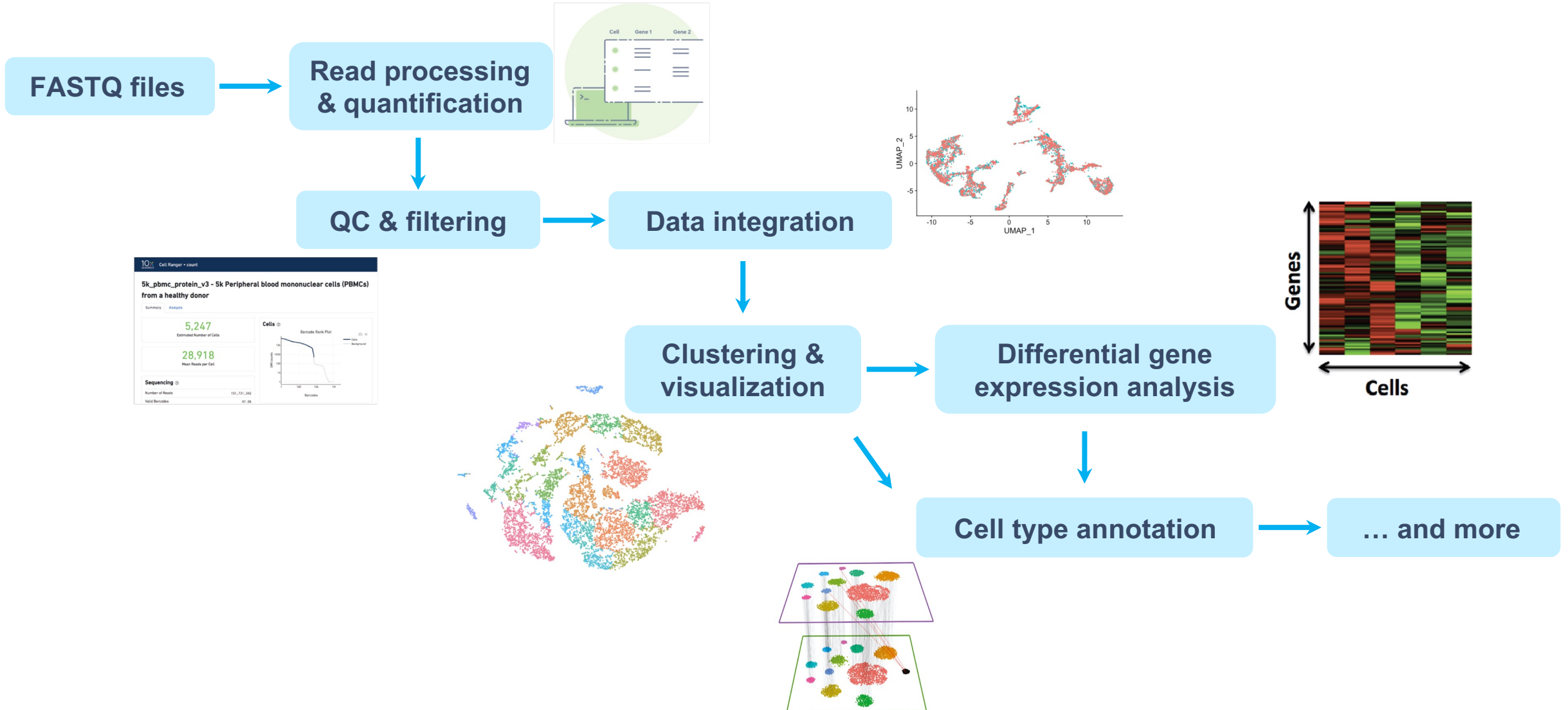
Common questions answered with scRNA-seq

- What gene markers are expressed in different cell populations?
- What cell types are present in my sample? Are there novel or rare cell types?
- What pathways are activated?
- How is the cell population in one sample different from the other (e.g. control vs. drug treatment)?
- How do cells transition from one state to another during development?
- How do cells communicate with each other?



Mouse intestine, ~6600 cells

Single cell gene expression - data analysis flow



Tools in the data analysis flow

Cell Ranger

- A collection of pipelines for processing 10x single cell data
- Developed by 10x Genomics

Loupe

- Desktop tool for analysis and visualization
- Developed by 10x Genomics

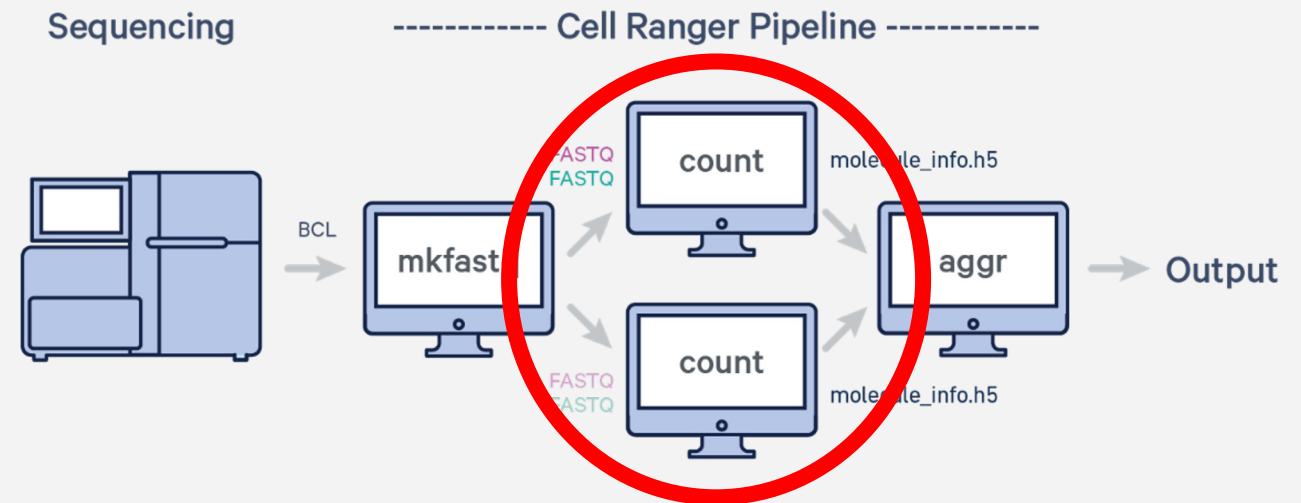
Community developed tools

- Primarily programming libraries with some stand-alone tools (e.g. Seurat)
- Developed by the broader research community
- Not officially supported by 10x Genomics

Overview of Cell Ranger

Cell Ranger introduction

- A suite of analysis pipelines that process Chromium Single Cell data
- Contains various pipelines for:
 - Demultiplexing (mkfastq)
 - Single sample analysis (count)
 - Combining data from multiple samples (aggr)
 - Reanalyzing data (reanalyze)



Running Cell Ranger

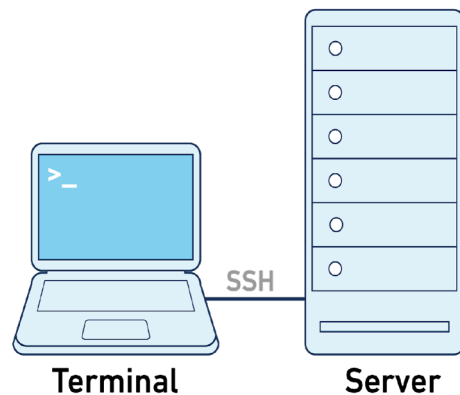
Required skills



On 10x Cloud: Friendly user interface and simple data management
(Available only in the US and Canada)

Required skill:

Understand the experimental design

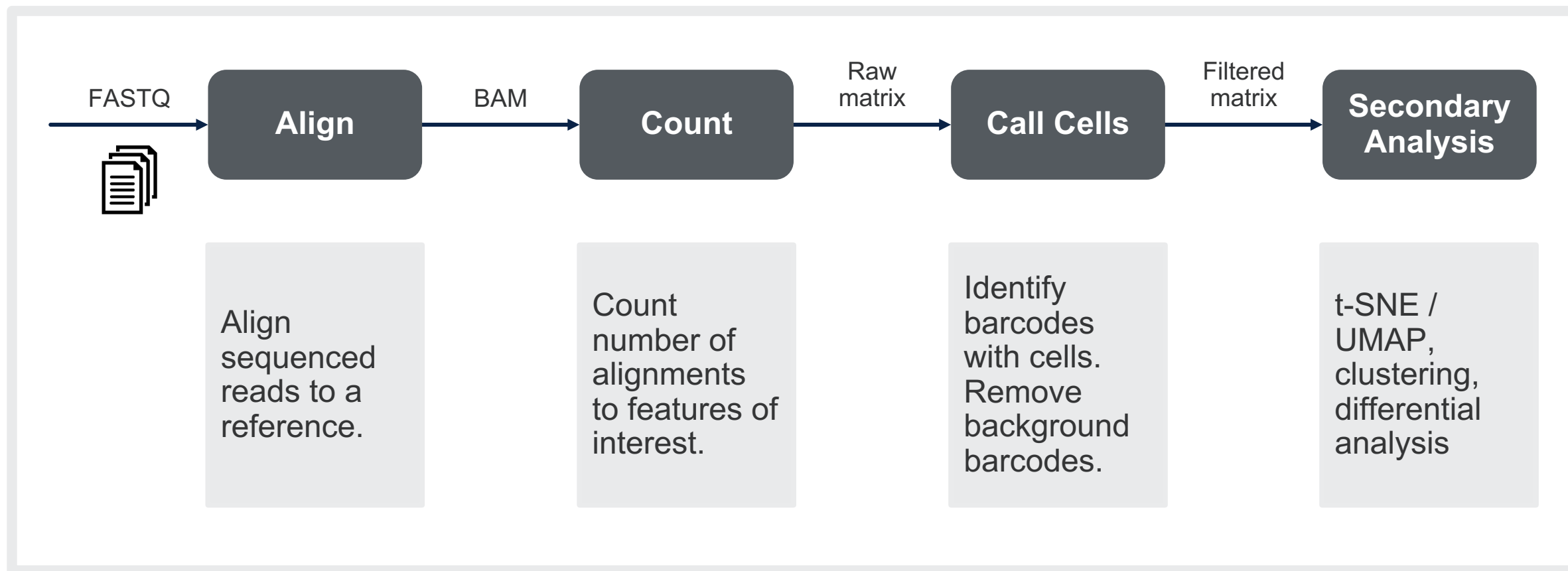


On a Linux system

Required skills:

- Understand the experimental design
- Comfortable running command line in the Linux environment
- Familiar with your organization's data management systems
- Know who to contact if there are server issues

Cell Ranger Analysis Steps



Where are we in our neutrophil analysis

Neutrophil analysis plan

Our journey through analysis

