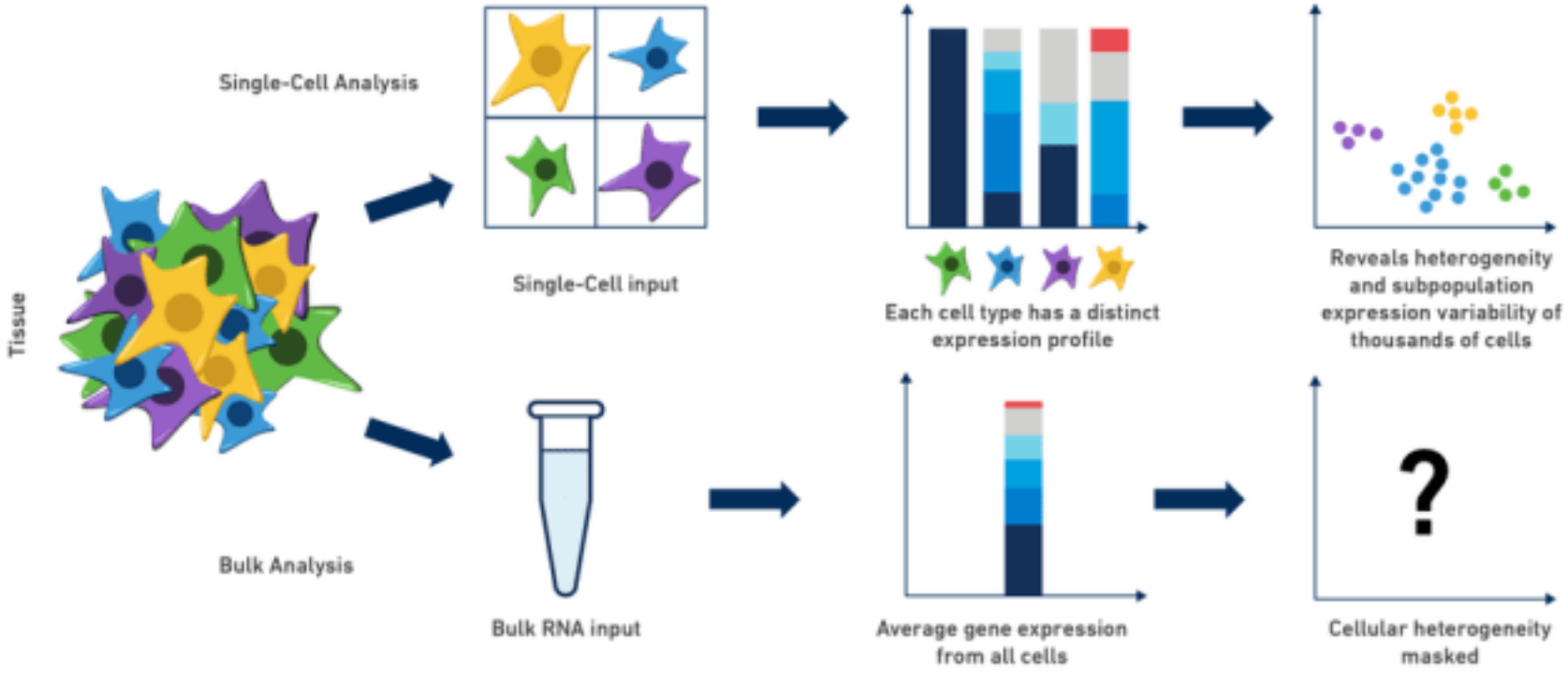
Single Cell RNA Sequencing

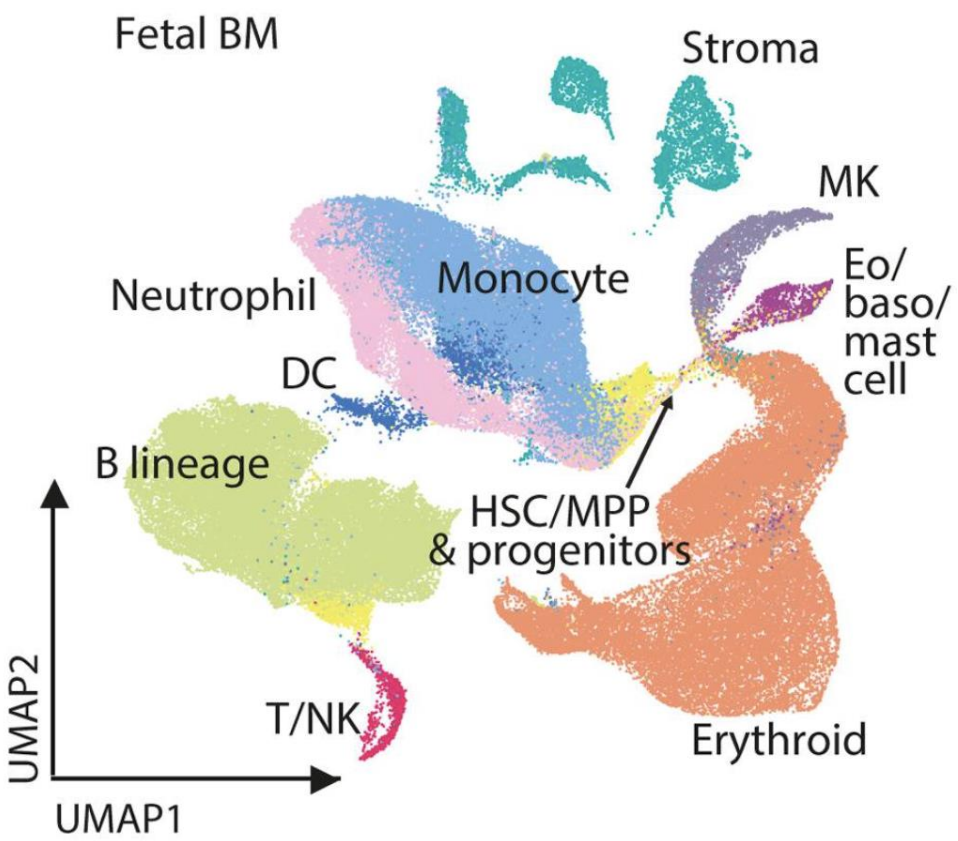
Chris Ozeroff

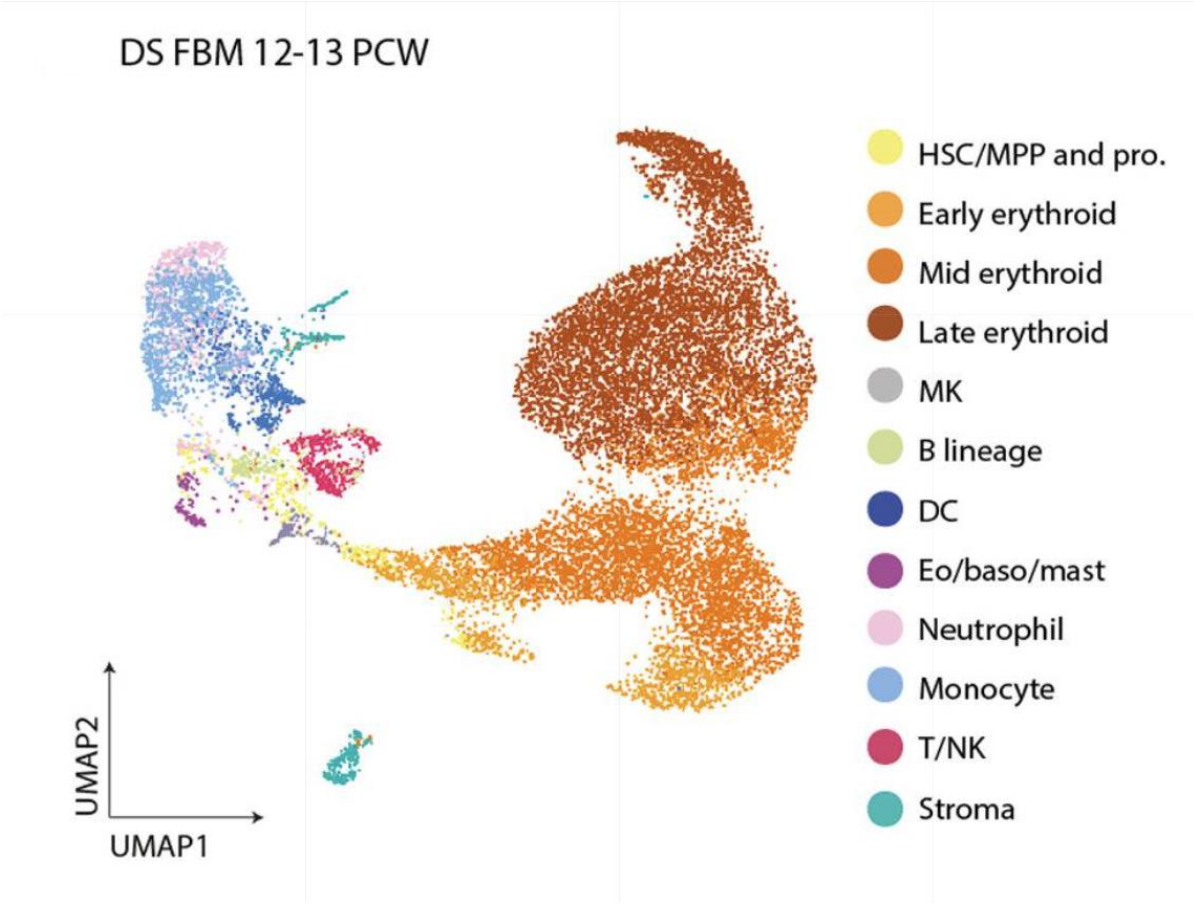
Short Read 2023

Single Cell RNA Sequencing



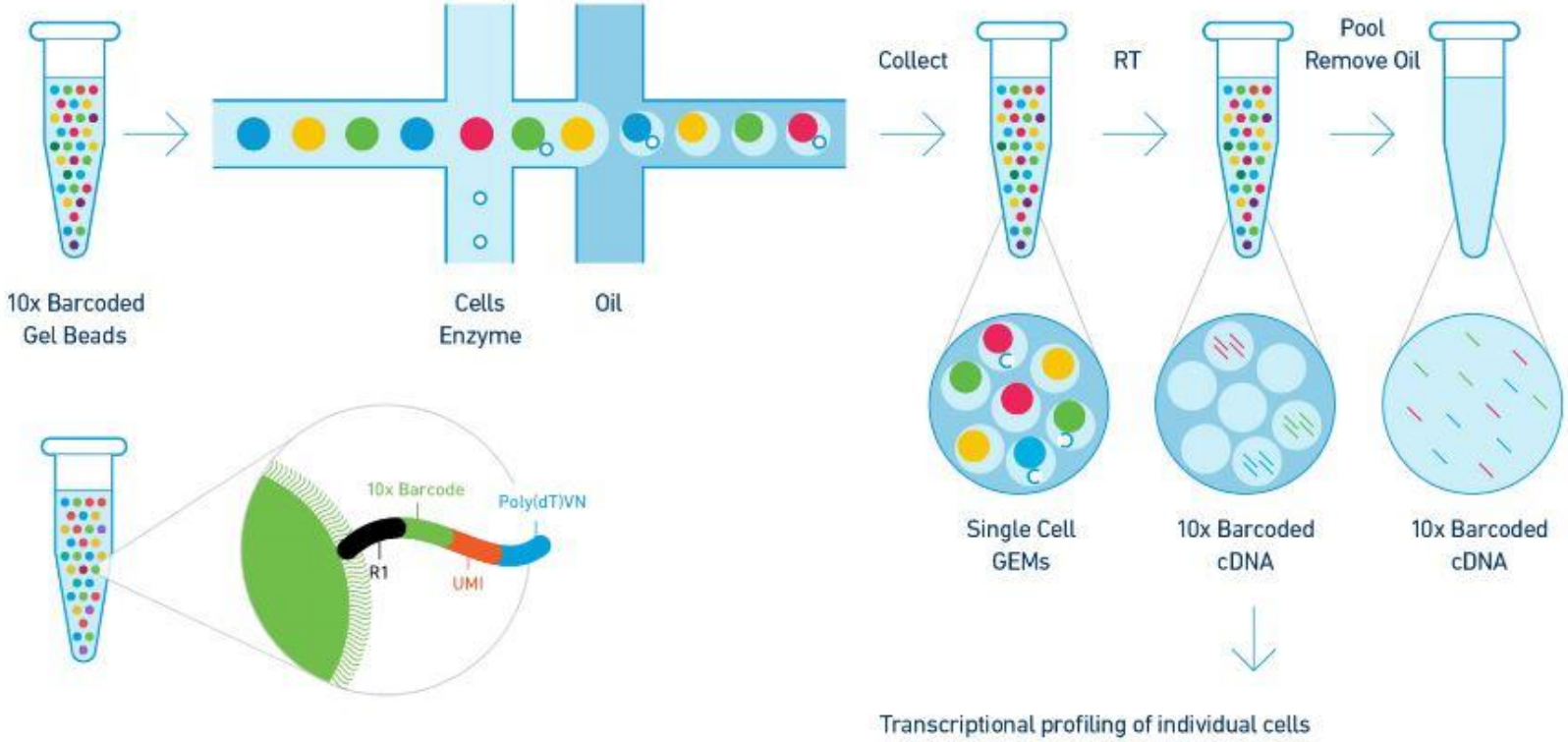
Down Syndrome vs. Typical Fetal Bone Marrow





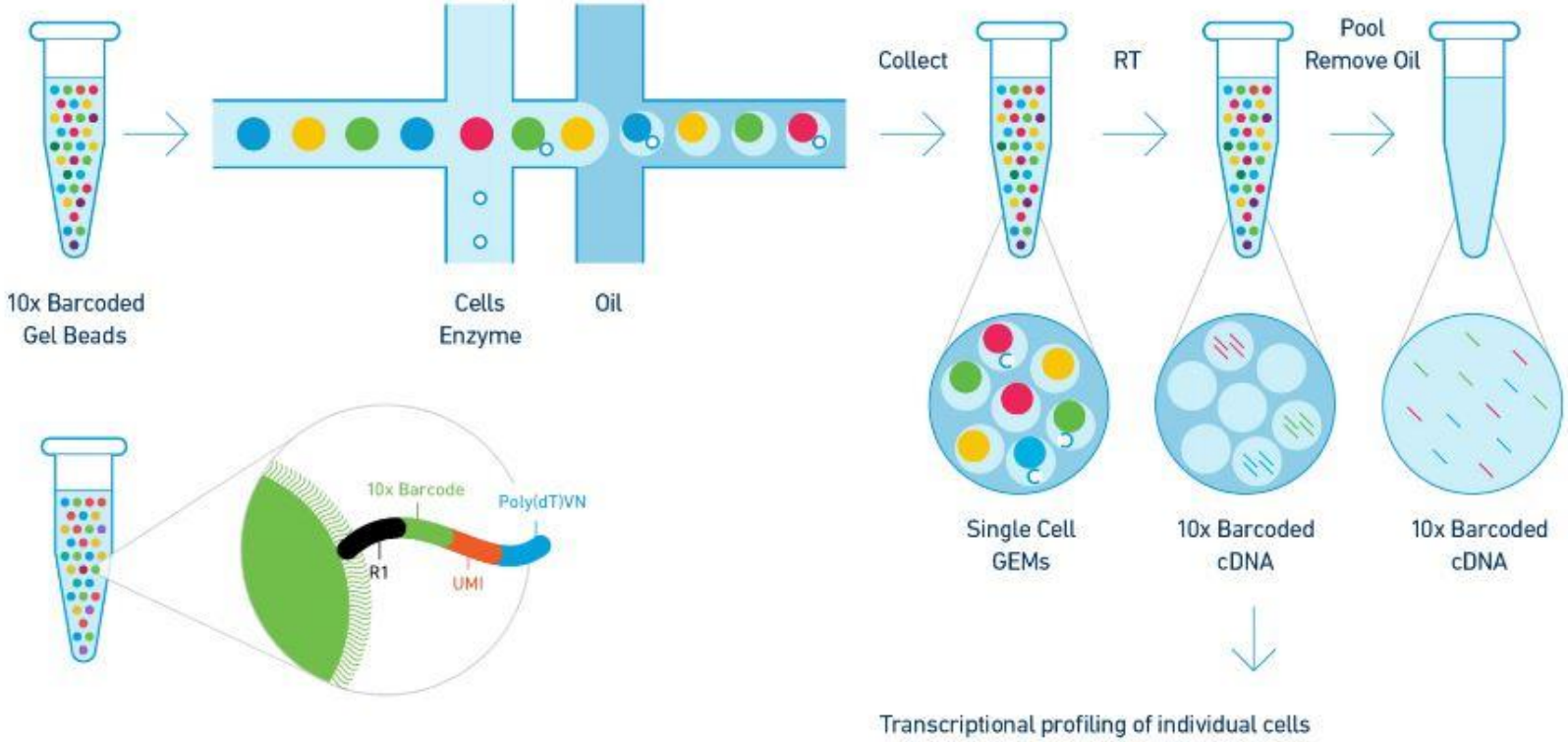
A. Ranzoni 2021

10X Genomics Droplet Method and Cell Ranger

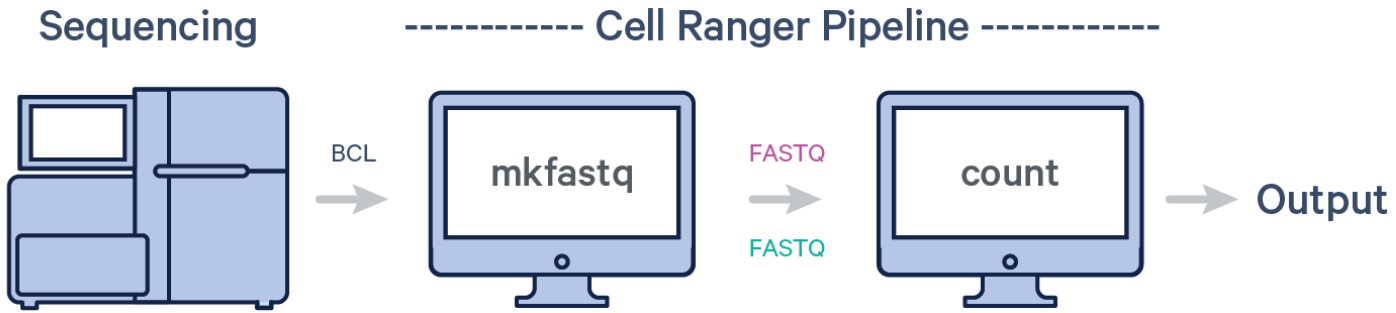


Genomics Technology Core,
University of Missouri, 2021

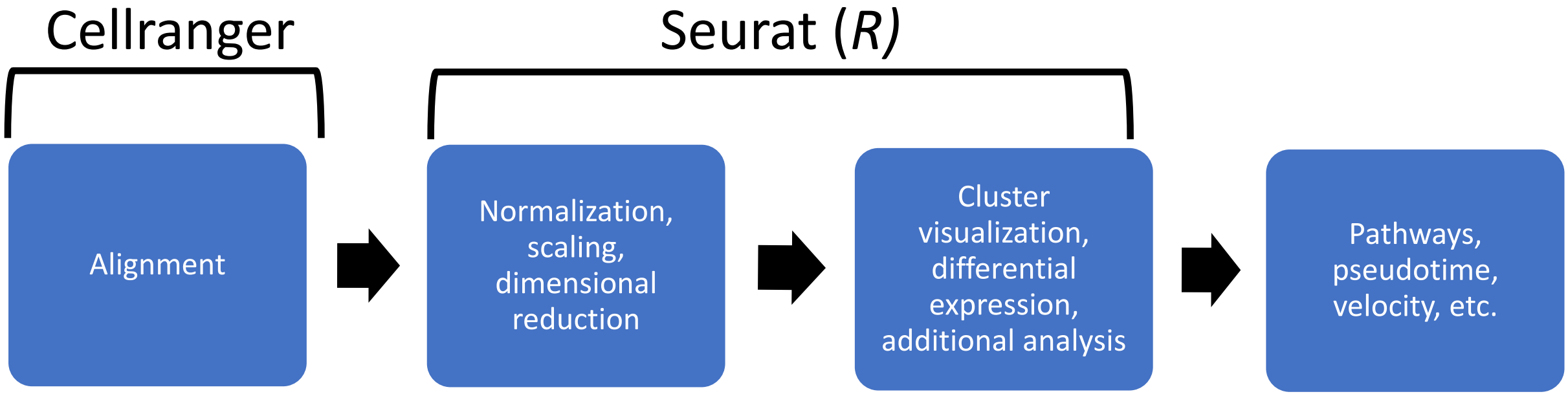
10X Genomics Droplet Method and Cell Ranger



Genomics Technology Core, University of Missouri, 2021



scRNA-seq workflow



Seurat

Remove debris/doublets

↓

Normalization

↓

Scaledata

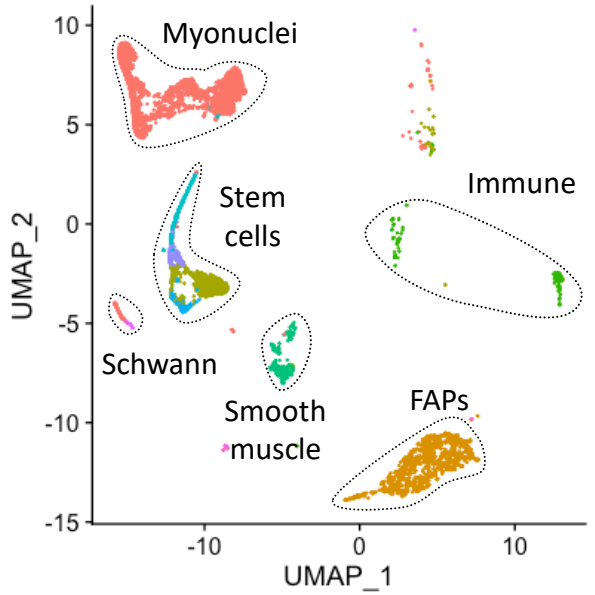
↓

PCA

↓

UMAP/clustering

A Sunday Afternoon on the Island of La Grande Jatte, Georges Seurat (1884)



"…named for Georges Seurat to invoke the analogy between the intricate spatial patterning of single cells and a pointillist painting." (doi: 10.1038/nbt.3192)

Seurat workflow

Processing individual Seurat objects

- Add metadata
- Merge Seurat objects
- Normalize data
- Find genes with variable gene expression
- Scale data
- Run PCA reduction

Integrating Seurat objects

Split Seurat objects and identify anchors (genes) to “integrate” objects

Plotting and clustering

UMAP reduction and visualization