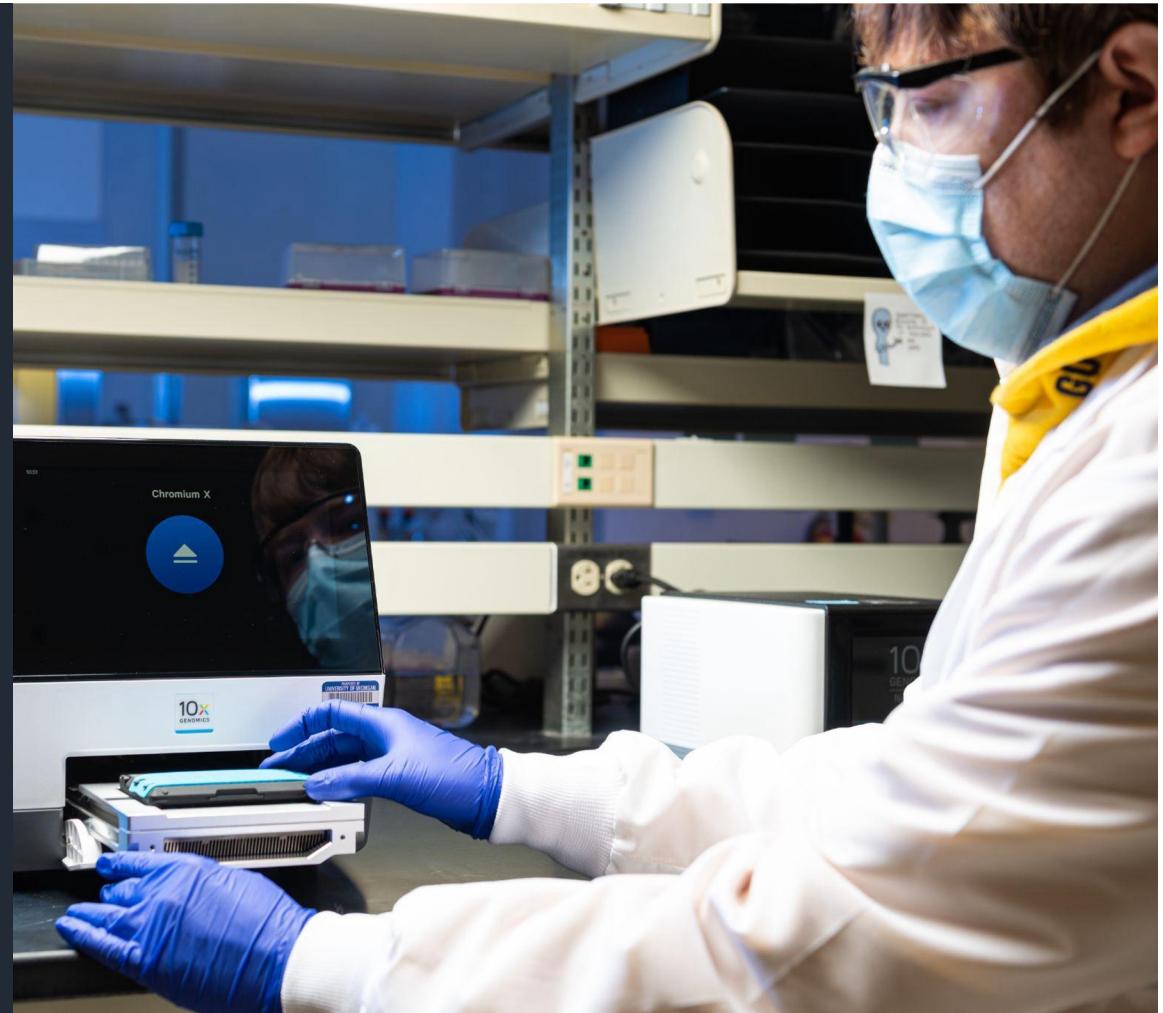
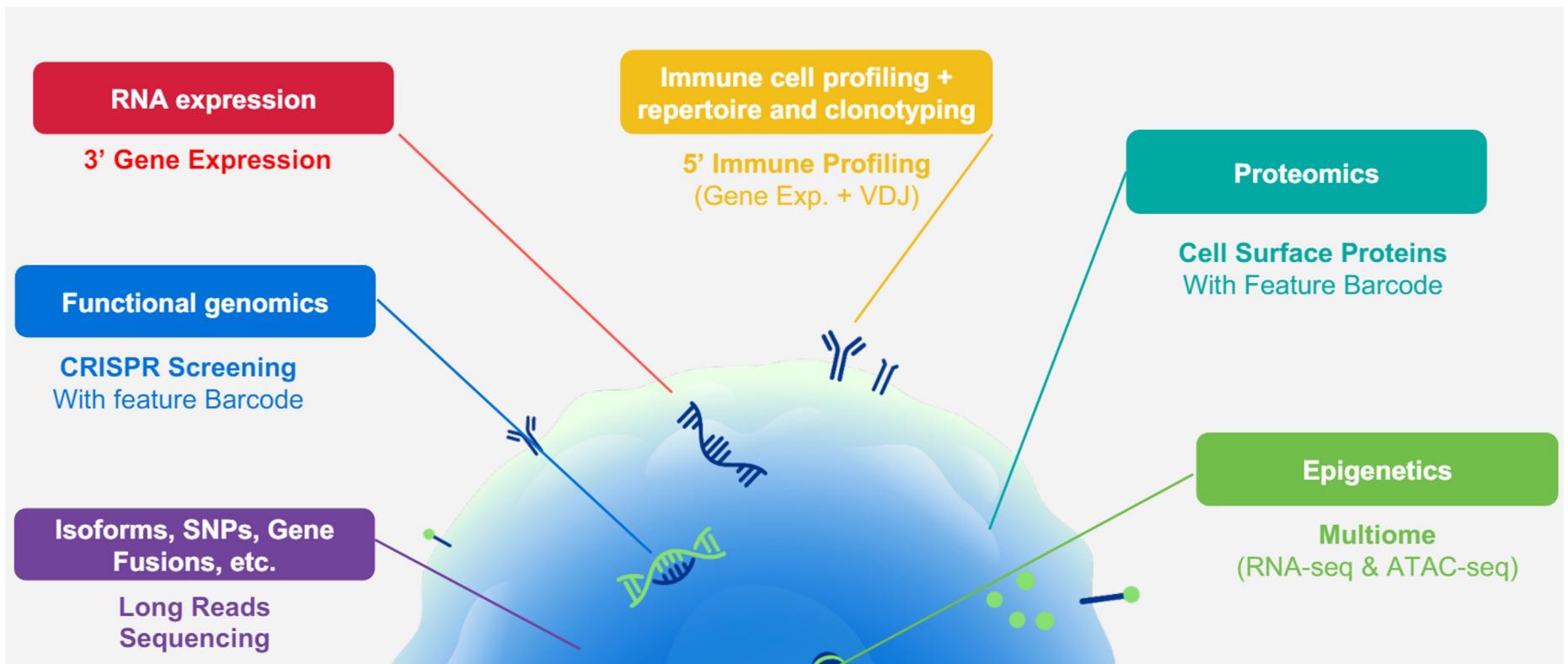


# Intro to Single Cell Technologies at the AGC

advanced-genomics@umich.edu

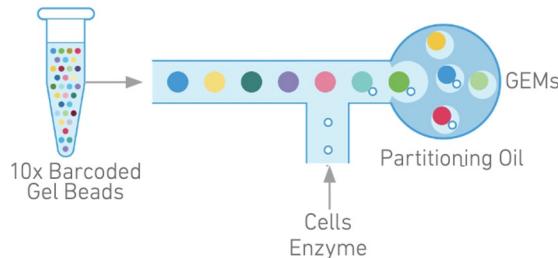


# Flavors of Single Cell Sequencing



# Approaches to Single Cell Sequencing

## Microfluidic Droplet-Based



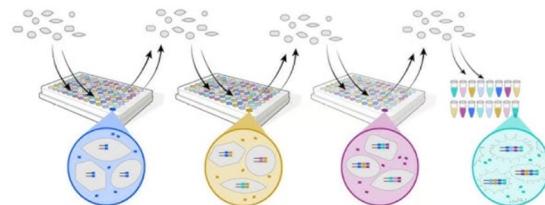
### Benefits:

- throughput
- performance consistency
- low per cell cost
- multi-modal compatible

### Limitations:

- size limitation (<30um)
- 3' or 5' bias or targeted

## Split-pooling



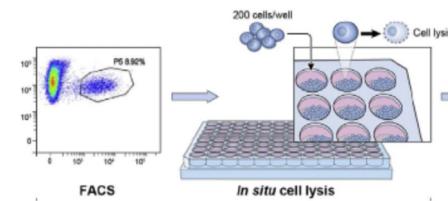
### Benefits:

- throughput
- reduced 3' bias
- size agnostic

### Limitations:

- fixation
- capture efficiency
- labor intensive

## Direct Cell Lysis



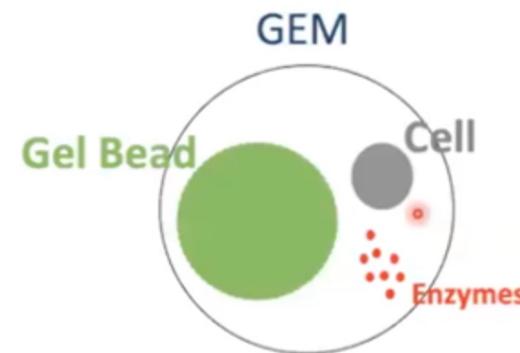
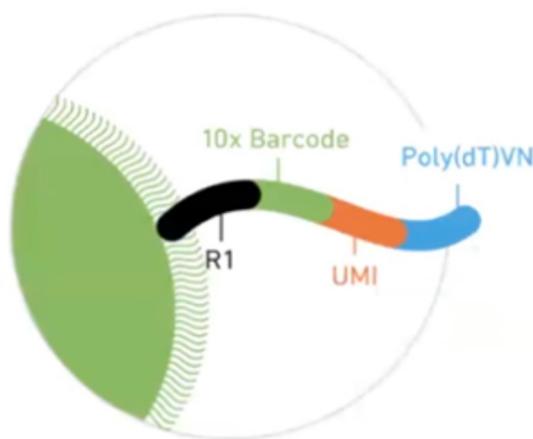
### Benefits:

- full-length

### Limitations:

- expense
- throughput

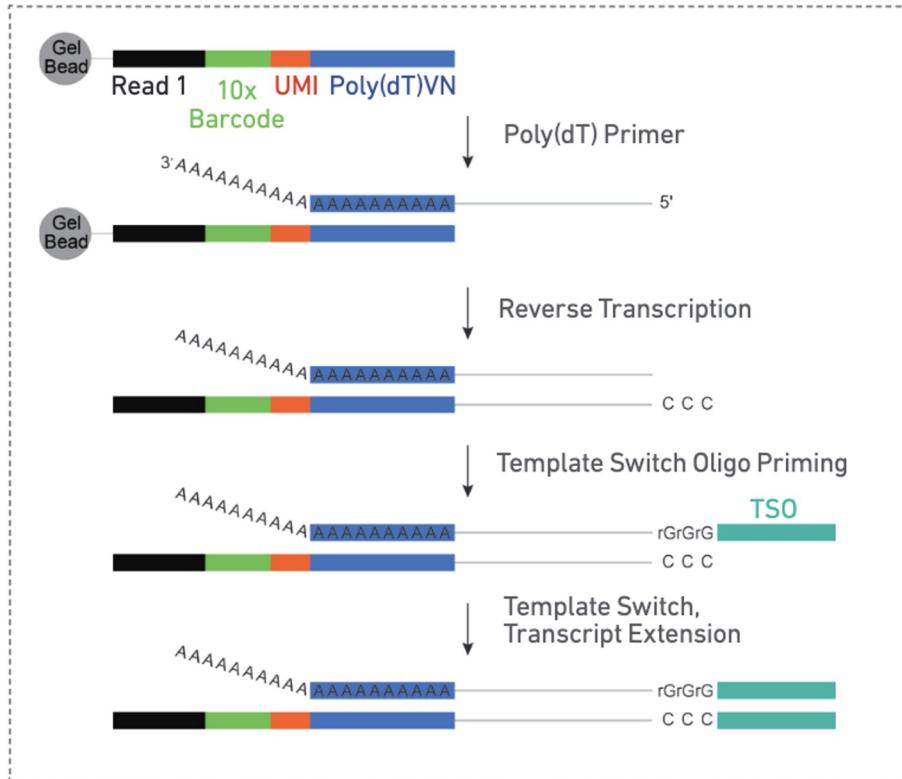
# Single Cell RNA Sequencing



# Transcript Capture Mechanisms

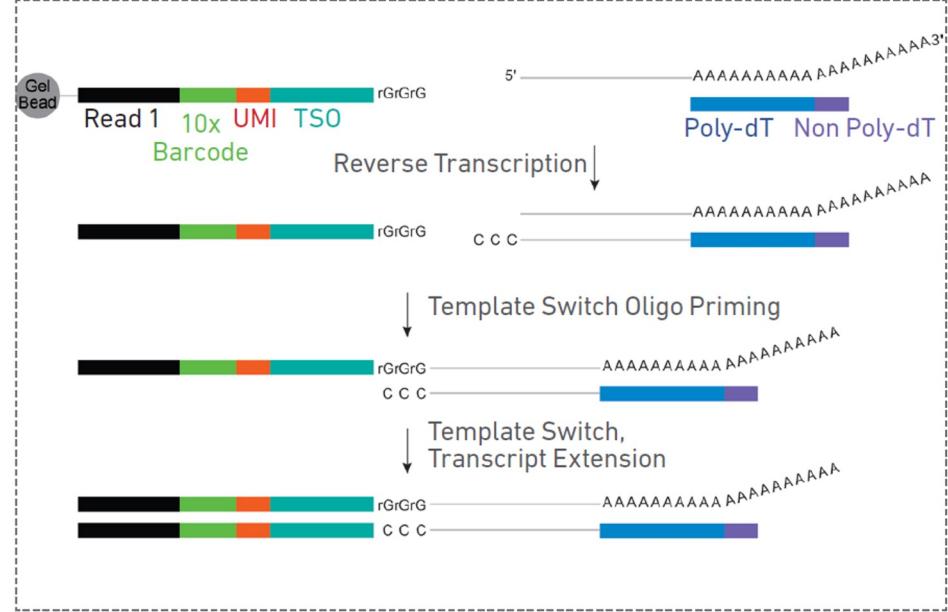
Inside individual GEMs

3' GEX



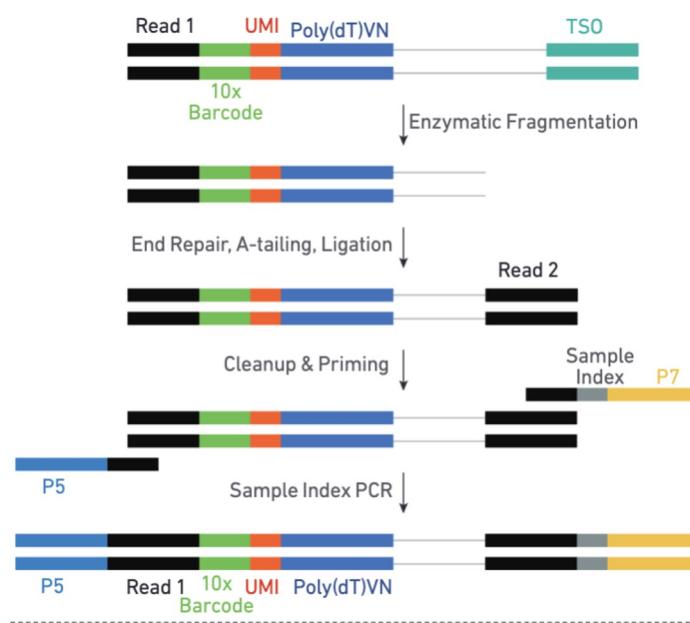
Inside individual GEMs

5' GEX

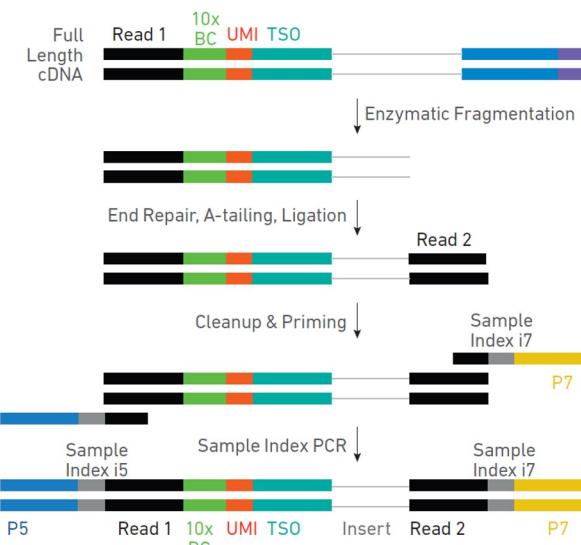


BIOMEDICAL RESEARCH CORE FACILITIES  
ADVANCED GENOMICS CORE  
UNIVERSITY OF MICHIGAN

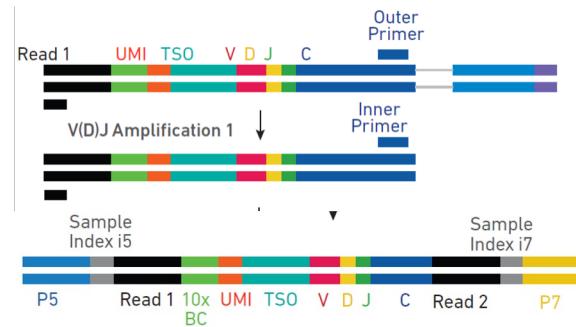
# 10x Capture Mechanisms



3' GEX Library



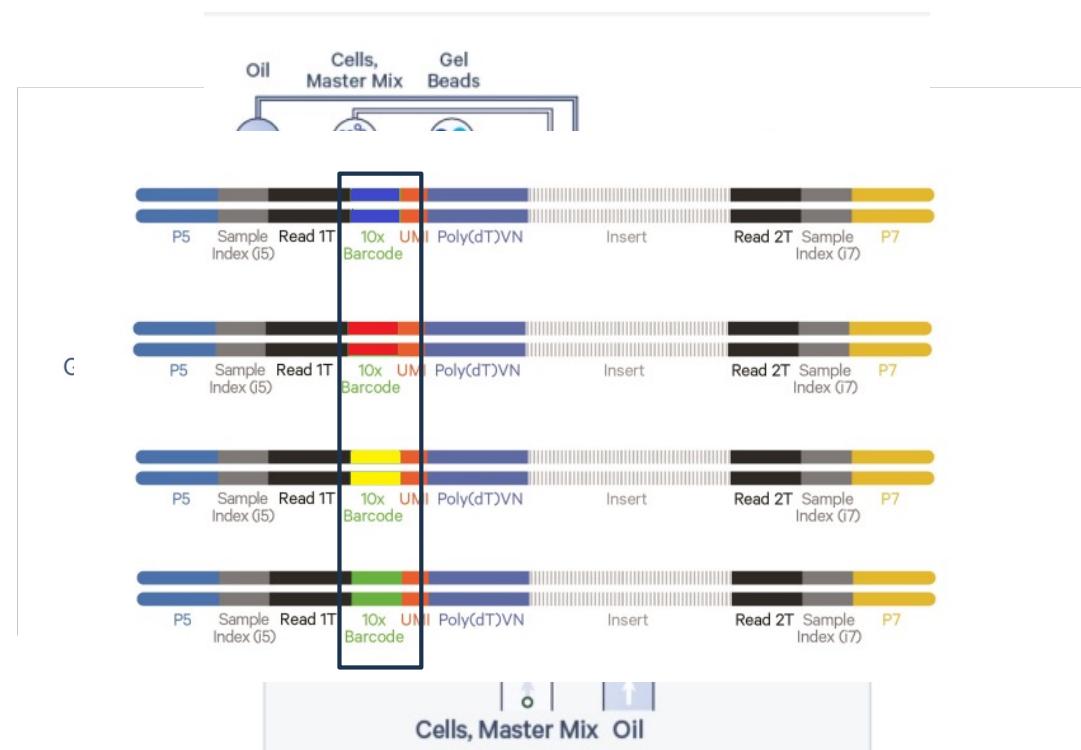
5' GEX Library



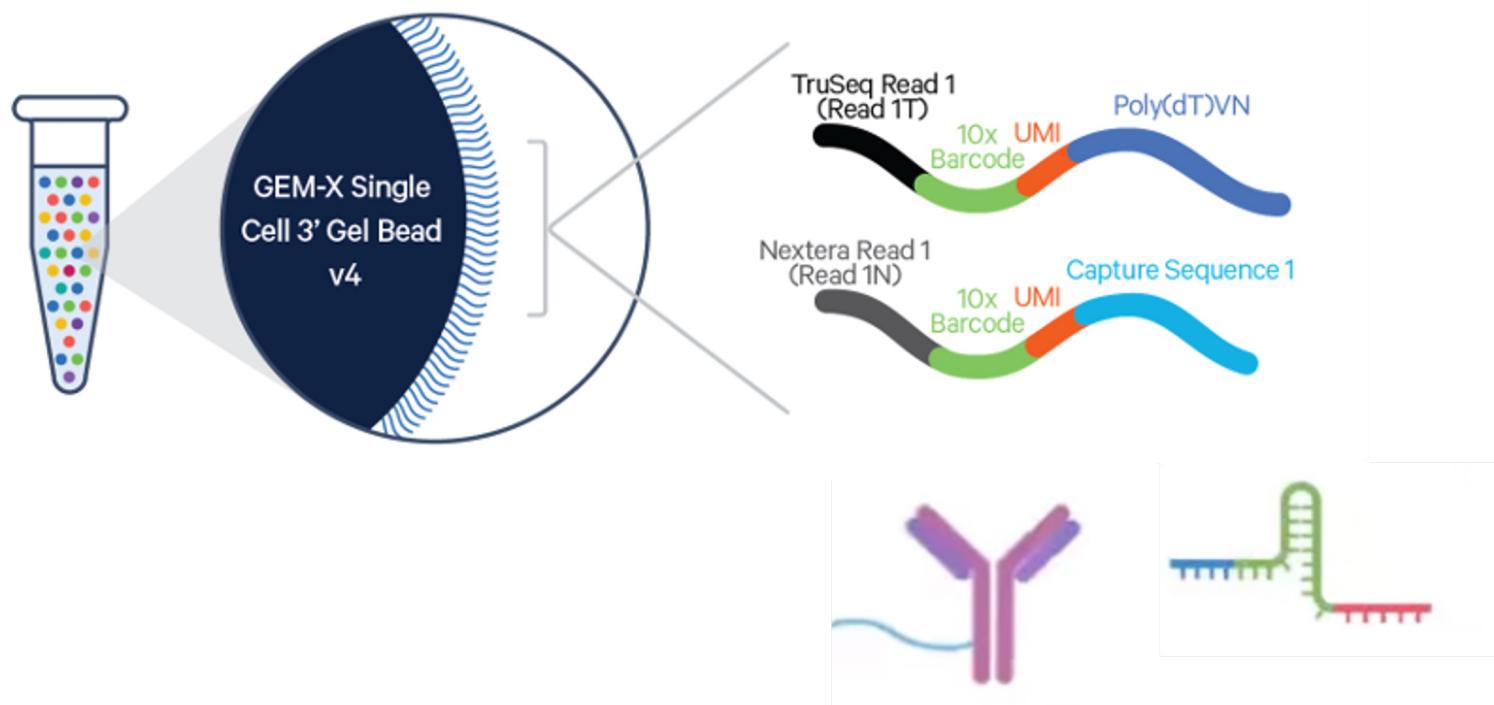
V(D)J Library

# 3' and 5' OCM: On-Chip Multiplexing

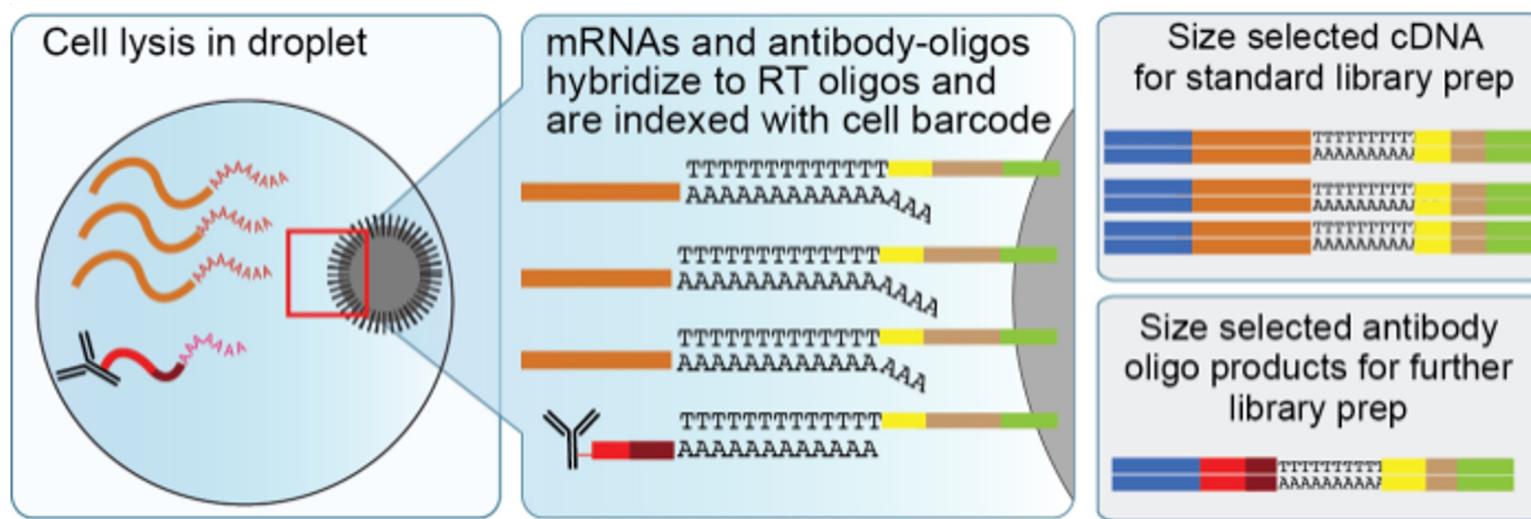
- Pool 4 samples
  - targeting 5000 cells/sample
- Compatible with
  - protein detection
  - TCR/BCR profiling
  - CRISPR screens



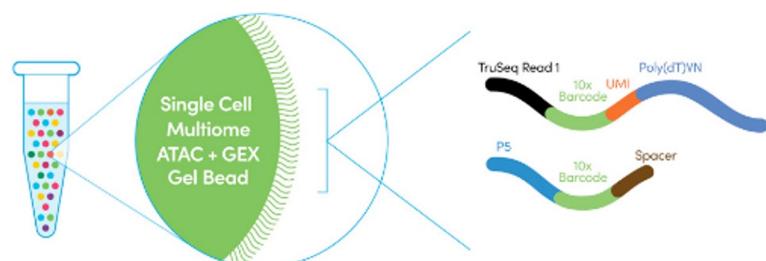
# Proteomics



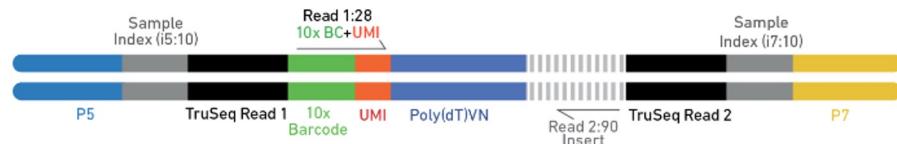
# Cellular Indexing of Transcriptomes and Epitopes



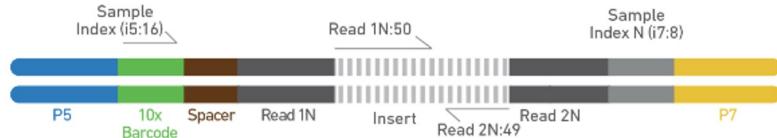
# Epi Multiome (ATAC + Gene Expression)



Chromium Single Cell Multiome Gene Expression Library

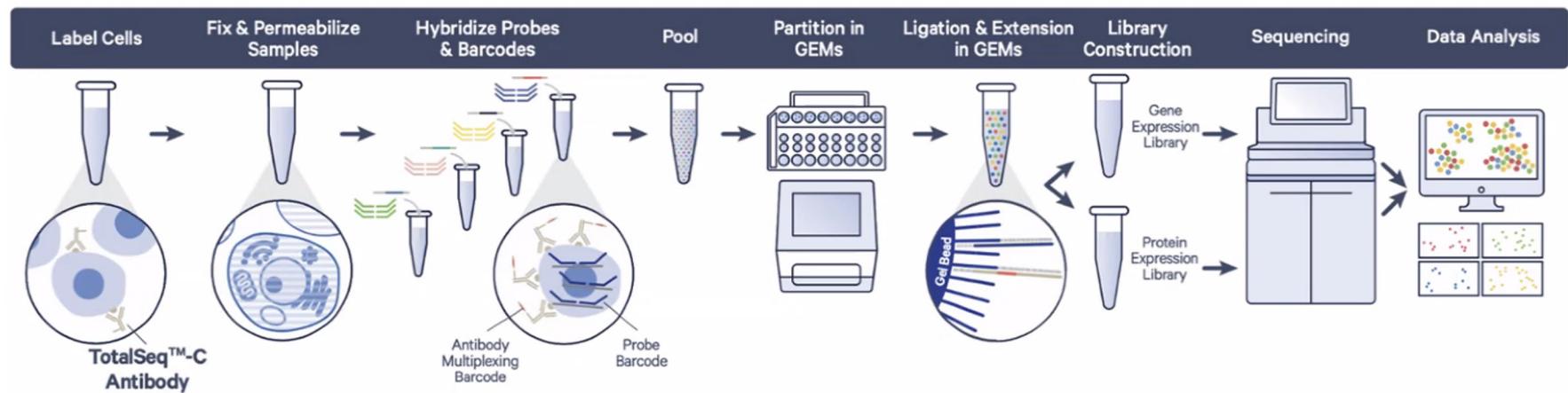


Chromium Single Cell Multiome ATAC Library



# Single Cell RNA Flex System

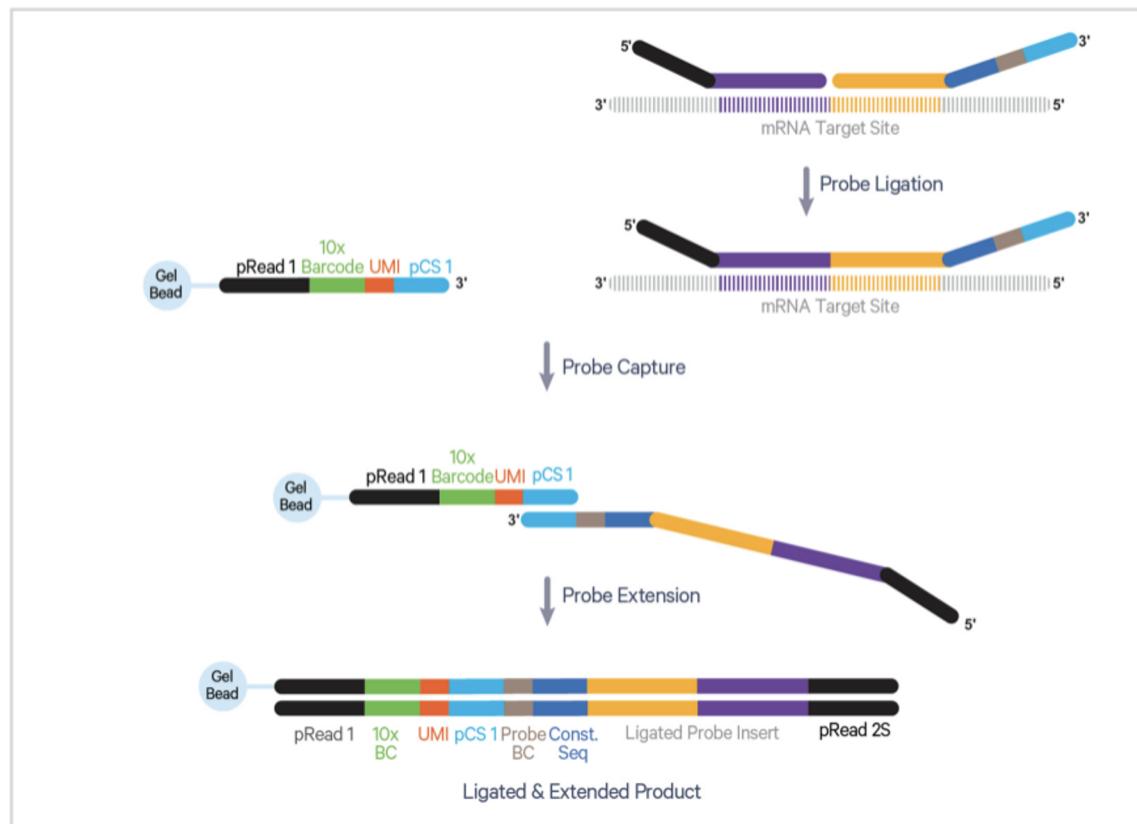
**Same workflow - More cost effective and scalable**



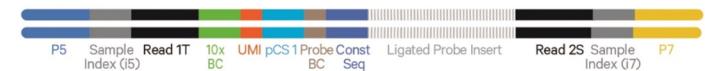
- Sensitive, probe-based **whole transcriptome assay**
- Compatible with Feature Barcode technology for **profiling cell surface and intracellular proteins** using singleplex or multiplex workflows
- Does not depend on polyA capture; covers more than 18,000 **human or mouse genes**

# How it works:

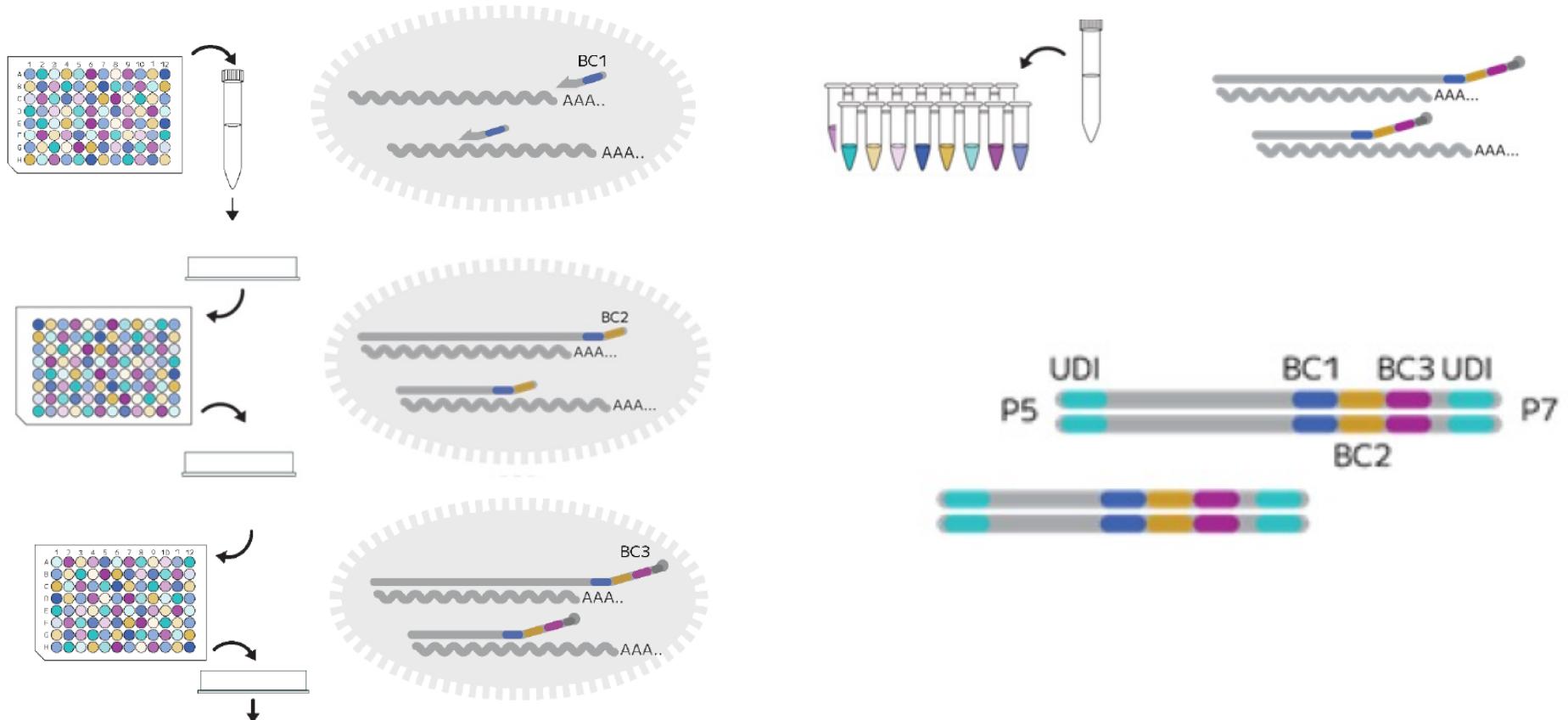
## Direct capture of ligated probes



Followed by in-bulk amplification of products, and library construction and QC



# SPLiT-seq

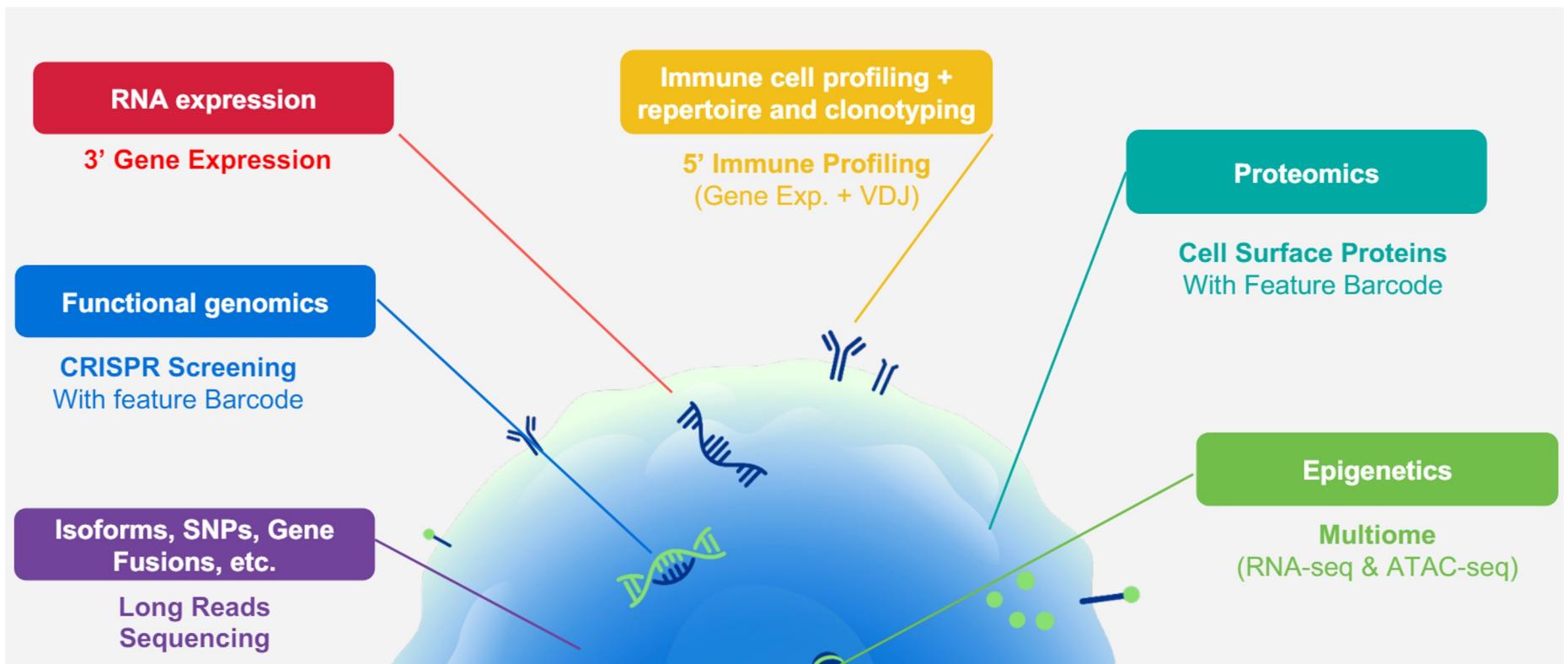


# SPLiT-seq

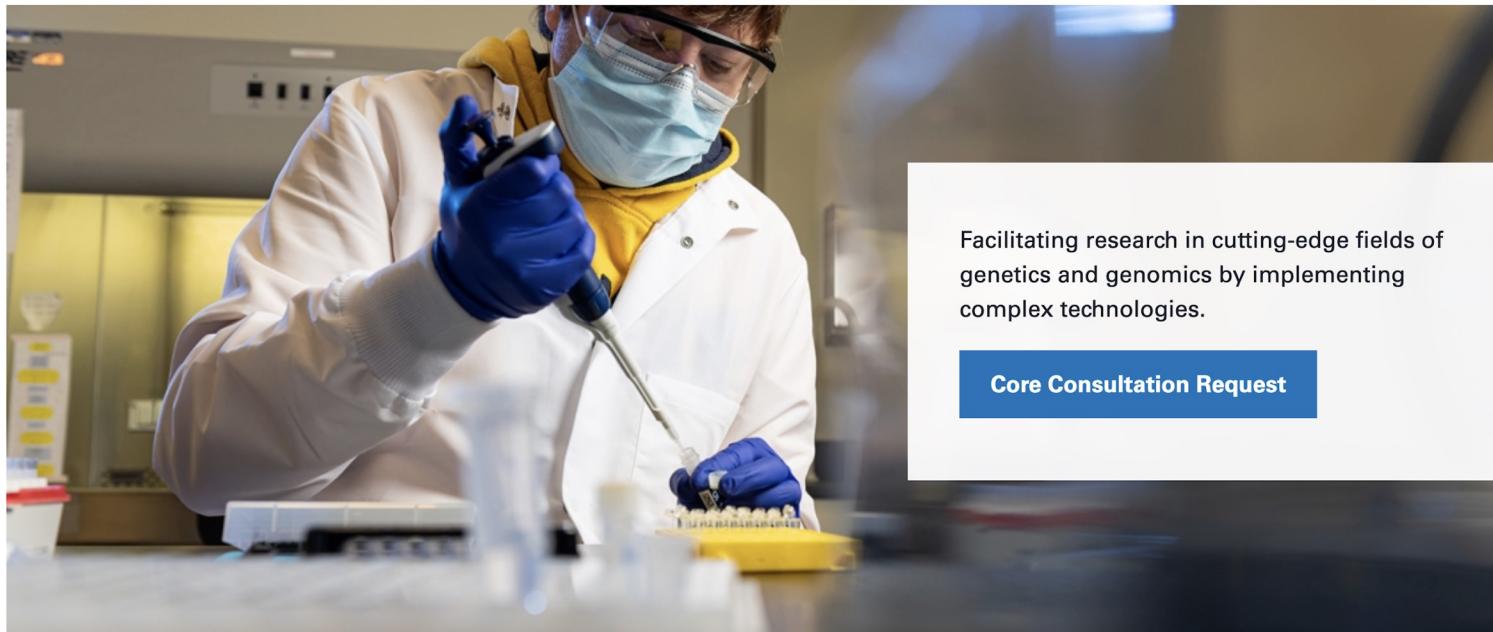


- Fix 100K-4 million cells or nuclei
- 5 million cells/96 or 384 samples
- RNA with TCR and CRISPR add-ons
- Fix 100K-2.5million cells or nuclei
- 4 million cells/96 samples
- RNA, Methylation, ATAC, CRISPR, Proteomics

# Flavors of Single Cell Sequencing



# ADVANCED GENOMICS CORE



Facilitating research in cutting-edge fields of genetics and genomics by implementing complex technologies.

[Core Consultation Request](#)

## Introductory Workshops



## Upcoming Workshop Dates:

**Short Read Sequencing**  
August 5, September 2

**Long Read Sequencing**  
August 19, September 16

**Spatial Analysis**  
August 5, September 2

**Single Cell Sequencing**  
August 19, September 16

Website: <http://michmed.org/agc>  
Email: [advanced-genomics@umich.edu](mailto:advanced-genomics@umich.edu)