10x Genomics is introducing groundbreaking new single cell products designed to low costs for small- and large-scale projects. The GEM-X Flex Gene Expression and GEM-X Universal 3' and 5' Gene Expression Multiplex assays push the boundaries of sample accessibility, sensitivity, and cost-efficiency. GEM-X Flex offers expanded support for fresh, frozen, and FFPE samples with highly sensitive probe-based profiling, reduced input requirements (down to 25K cells), and up to 80% recovery efficiency. It enables large-scale studies with improved throughput and cost savings, benefiting applications from biomarker discovery to translational research. Meanwhile, GEM-X Universal Multiplex introduces on-chip multiplexing for 3' and 5' assays, simplifying workflows and enhancing compatibility across species and challenging sample types. This technology delivers up to 70% cell capture rates and unparalleled sensitivity, supporting robust statistical analyses with biological or technical replicates, all at a low per-sample cost without additional steps.

Introducing GEM-X innovations for small- to large-scale studies

Samantha Shelton, Ph.D.
Science & Technology Advisor, 10x Genomics

Unlock the full spectrum of biology

Chromium

Unbiased cellular discovery

- Whole transcriptome
- Transcriptome, VDJ, CRISPR gRNAs, protein, chromatin
- Sequencing-based
- Single cell resolution
- High per-gene sensitivity and breadth

Visium

Unbiased spatial discovery

- Whole transcriptome
- Transcriptome, protein, histology
- Sequencing-based
- Single cell scale
- High gene breadth

Xenium

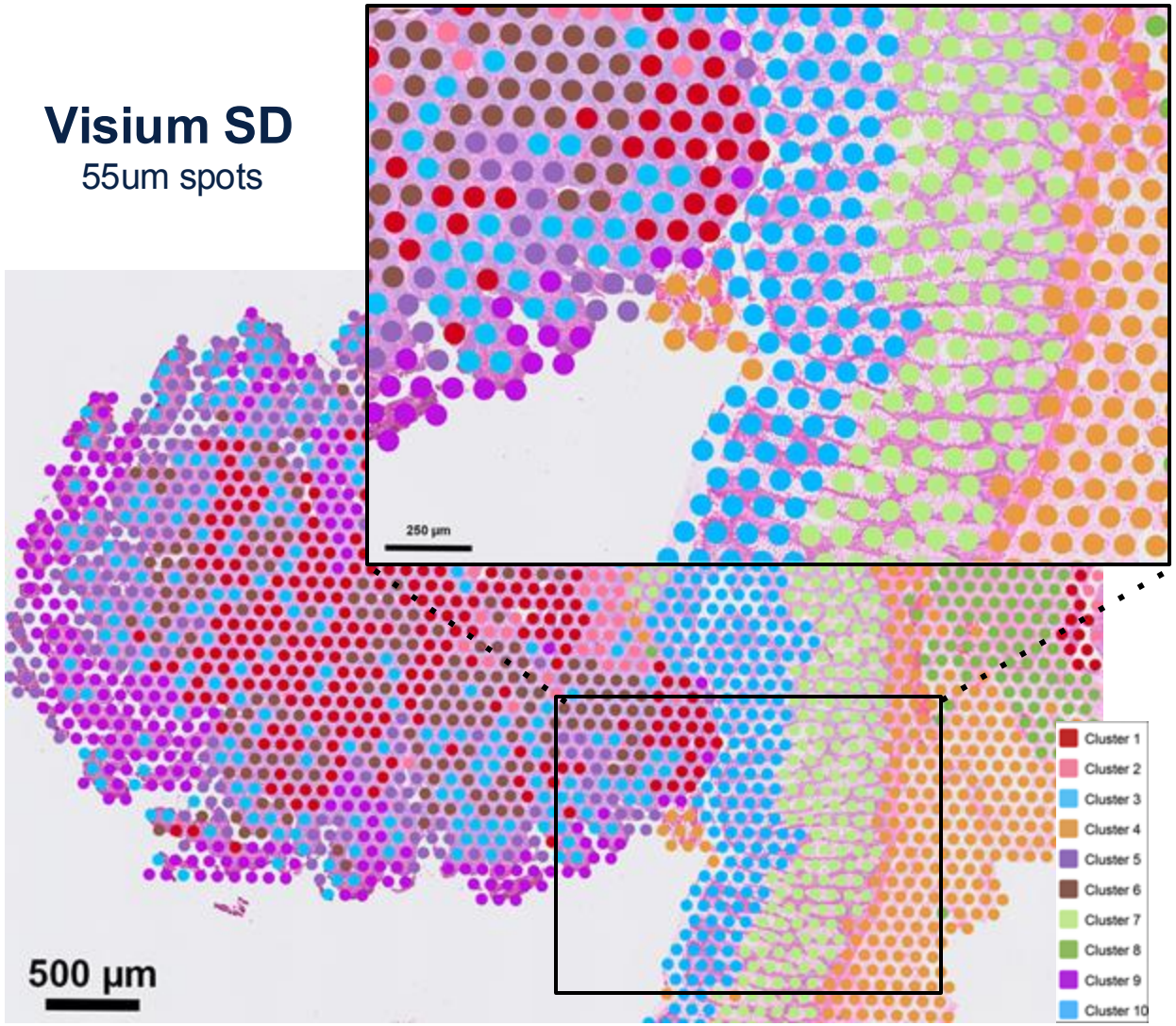
Precise single cell spatial insights

- 100s–1,000s of transcripts
- Targeted RNA, protein, histology
- High-resolution imaging-based
- Subcellular resolution
- High per-gene sensitivity

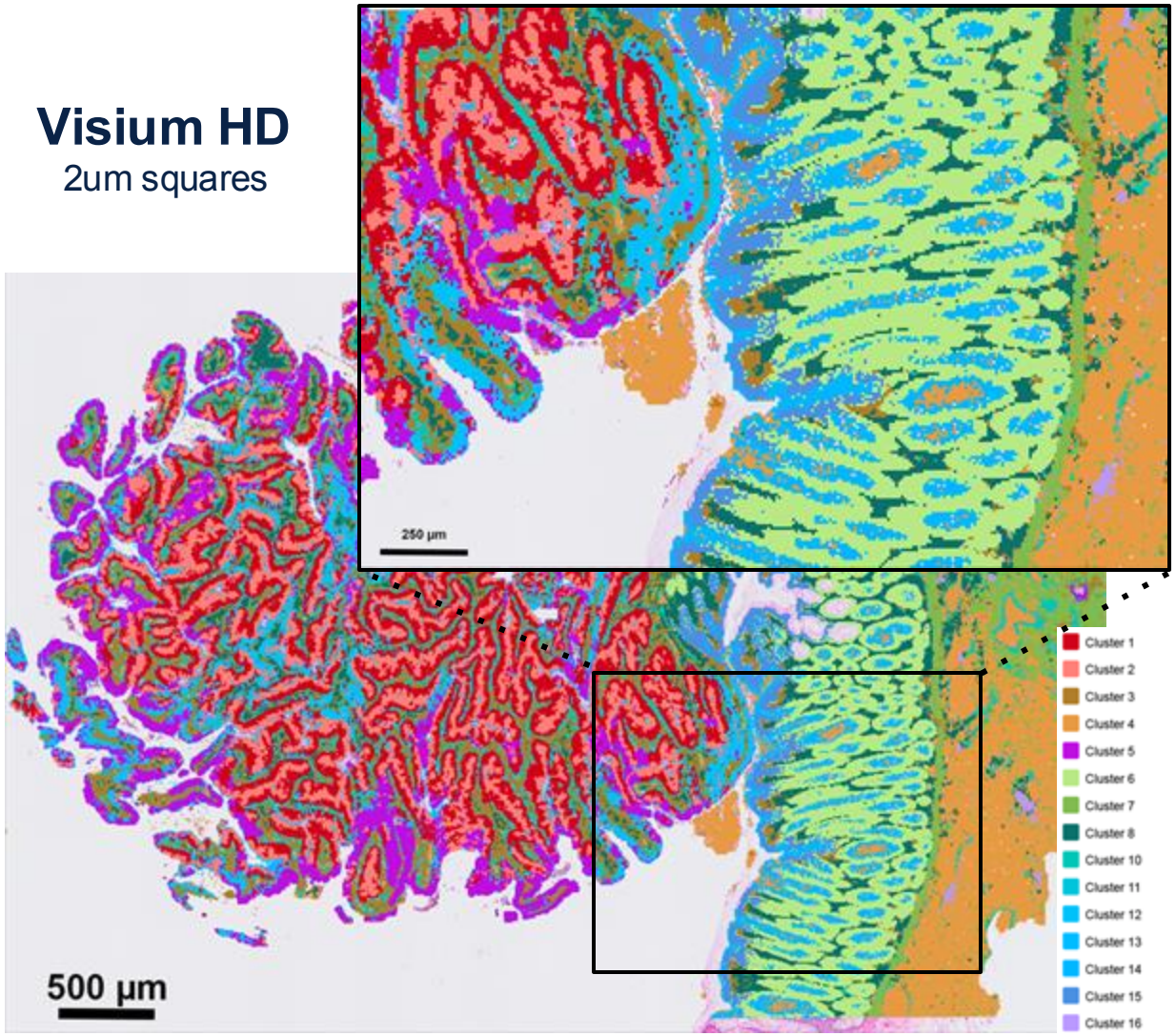
10x GENOMICS

Visium resolution options: standard and high definition

Visium SD
55um spots



Visium HD
2um squares



10X GENOMICS

FFPE human colorectal cancer

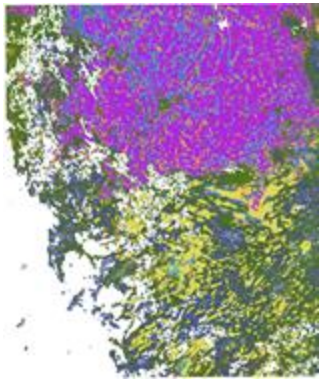
Visium HD 3’ RT assay (in development)

Coming soon

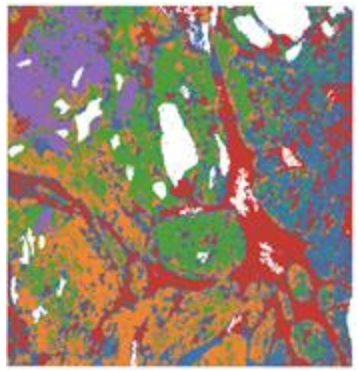
Mouse Small Intestine

Mouse Lung

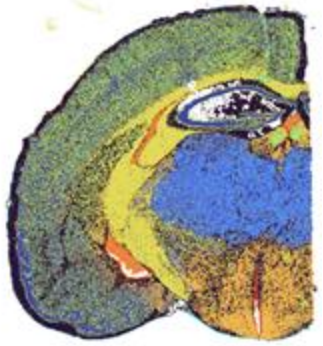
Human Breast Cancer



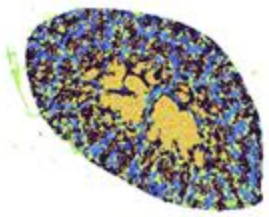
Human Liver Cancer



Mouse Brain

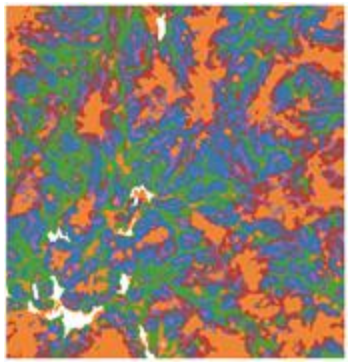


Mouse Kidney

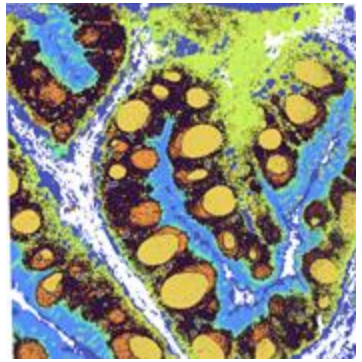


2mm

Human Colon Cancer



Human Tonsil



Unbiased clustering @ 8 µm x 8 µm bins

- 3’ RT-based assay – species agnostic
- Visium HD slides with 2 µm features
- Runs on CytAssist
- Fresh frozen tissues

Incredible enthusiasm for Xenium

"In our Experimental Pathology lab, we have successfully implemented Xenium. We were impressed by the **ease of use, the robustness of the platform, and the quality and resolution of the data**."

Dr. Katja Steiger
Head of Comparative Experimental Pathology, Technical University of Munich

"We are thoroughly impressed by the seamless and intuitive workflow. Xenium is allowing us to better support the cutting-edge research on campus."

Dr. Olivia Koues
Managing Director, Advanced Genomics Core, University of Michigan

Xenium panel and custom menu offers maximum flexibility

Pre-designed & validated panels

Xenium Prime 5k Pan Tissue & Pathways (Human or Mouse)
5000 genes

Human breast
280 genes

Human lung
289 genes

Human brain
266 genes

Human skin
260 genes

Human immuno-oncology
380 genes

Add up to 100 custom targets

Human multi-tissue & cancer
377 genes

Human colon
322 genes

Mouse brain
248 genes

Mouse multi-tissue
379 genes

Standalone custom

480 custom genes

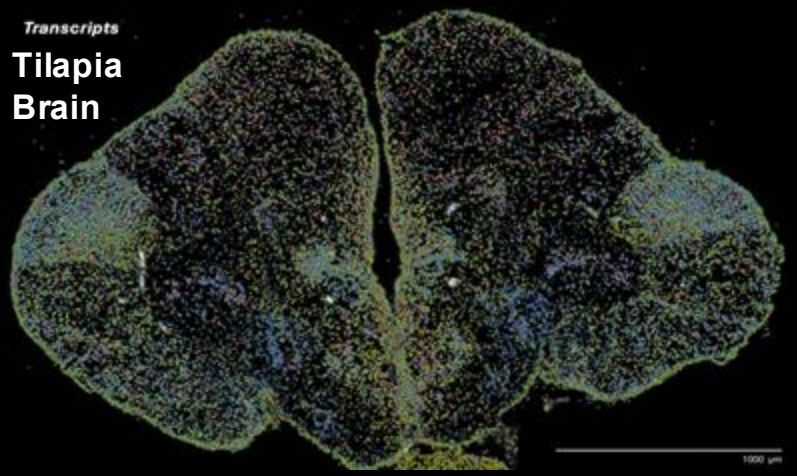
300 custom genes

100 custom genes

50 custom genes

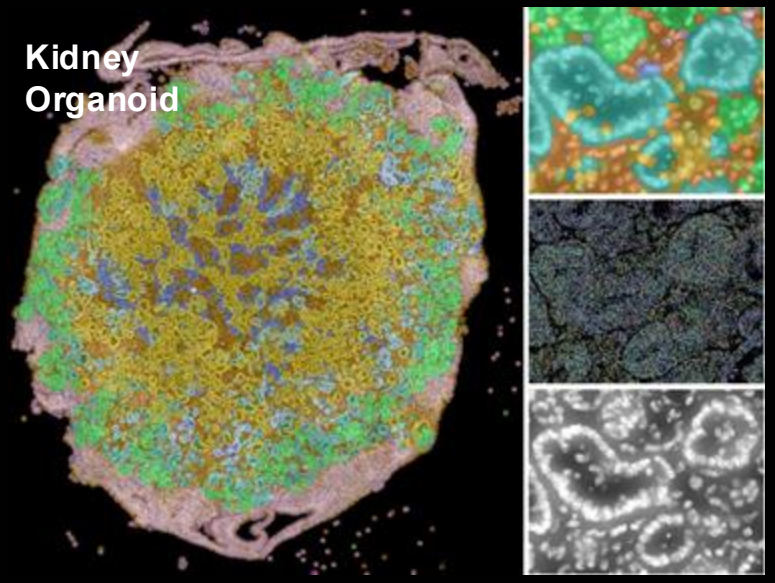
Customer success with Xenium custom

Tilapia Brain



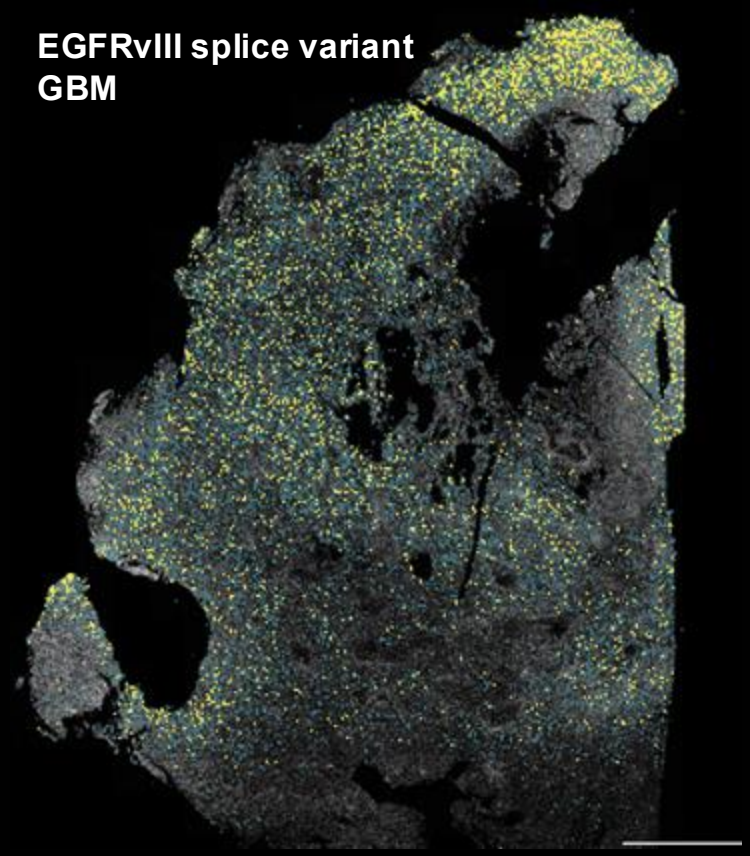
https://x.com/10xGenomics/status/1767939225843015683

Kidney Organoid



Alex Combes, PhD Monash University

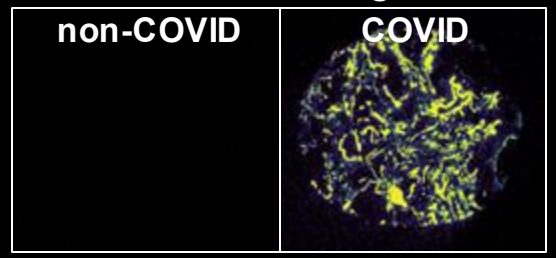
EGFRvIII splice variant GBM



Simon Gregory Duke University

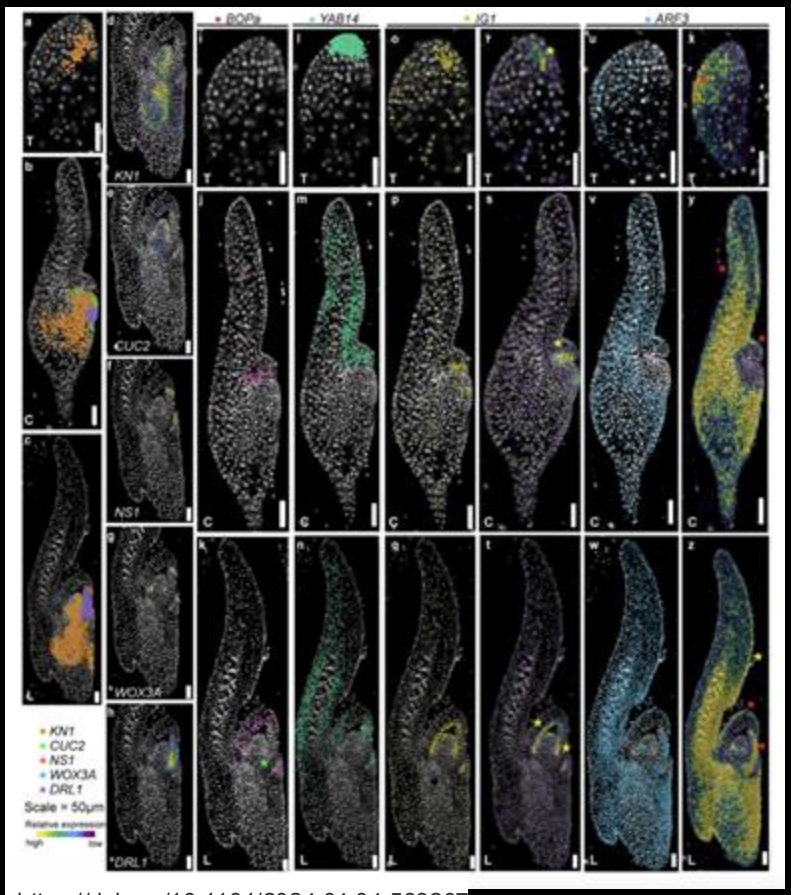
Human Lung

SARS-CoV-2 S2



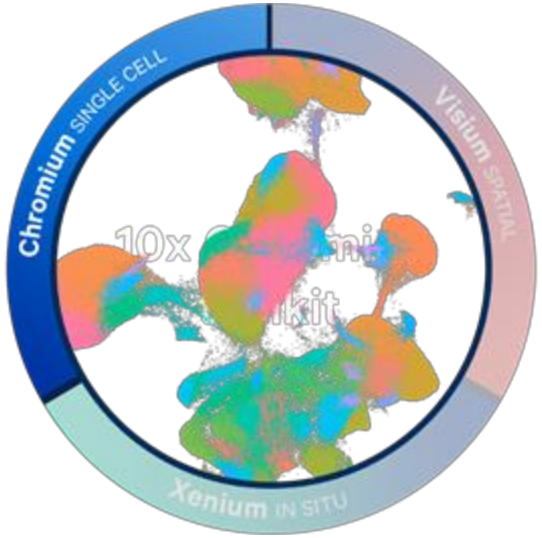
Emanuel Wyler MDC Berlin

Maize



https://doi.org/10.1101/2024.04.04.588207

Chromium's Proven Innovation Engine



2015
Linked Reads
First launch

2016
Single Cell Gene Expression v1 and v2

2017
Single Cell Immune Profiling v1

2018
Single Cell ATAC v1
Single Cell Gene Expression v3
Feature Barcode Technology (3' and 5')

2019
Single Cell ATAC v1.1
Single Cell Gene Expression v3.1
Single Cell Immune Profiling v1.1
Next GEM Technology

2020
Single Cell Multiome ATAC + Gene Expression
Single Cell Immune Profiling v2
CellPlex
Chromium Connect

2021
Single Cell Gene Expression v3.1 LT
Single Cell Gene Expression v3.1 HT
Single Cell Immune Profiling v2 HT
Chromium X + iX

2022
Single Cell Gene Expression Flex
Single Cell ATAC v2
Nuclei Isolation Kit
Single Cell Gene Expression Flex + FFPE
BEAM

2023
Single Cell Gene Expression Flex + Multiplexed Protein
Single Cell Gene Expression Flex + Intracellular Protein

10x GENOMICS

Introducing new Chromium Single Cell product families

Universal Assays

Universal 3’ Gene Expression
Formerly Single Cell Gene Expression

Universal 5’ Gene Expression
Formerly Single Cell Immune Profiling

Flex Assays

Flex Gene Expression
Formerly Single Cell Gene Expression Flex (or Fixed RNA Profiling)

Epi Assays

Epi Multiome ATAC + Gene Expression
Formerly Single Cell Mutiome ATAC + Gene Expression

Epi ATAC
Formerly Single Cell ATAC

Chromium Single Cell product families

Universal Assays

- Gather broad information from diverse species (poly-A genes, isoforms, SNPs, etc.)
- RT-based assays that capture the whole transcriptome, compatible with a diverse set of species
- Multiomic options:
  - 3’ and 5’ gene expression
  - TCR/BCR
  - Protein
  - CRISPR

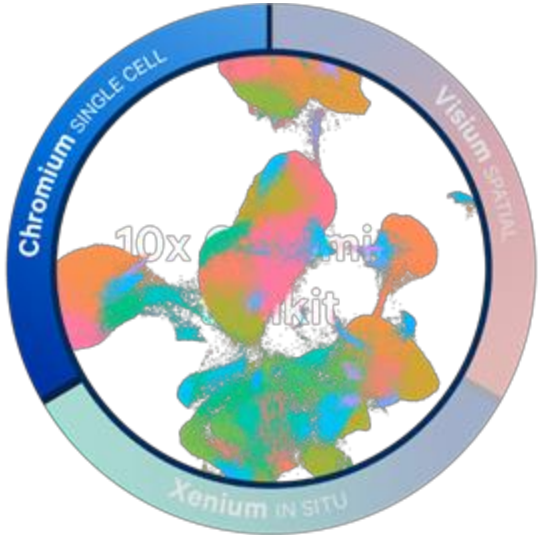
Flex Assays

- Exceptional performance with challenging samples including FFPE
- Probe-based assays that capture 18,000+ coding genes, customizable to fit project needs
- Maximum scale: 2.56M cells/run
- Multiomic options:
  - Gene expression
  - Protein
  - CRISPR

Epi Assays

- Investigate chromatin state and regulatory elements (ATAC-seq)
- Directly link 3’ gene expression and epigenomic profiles from the same nucleus
- Profile up to 80,000 nuclei per run
- Multiomic options
  - Gene expression
  - Chromatin accessibility

Chromium's Proven Innovation Engine



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Single Cell Gene Expression Flex + FFPE
BEAM

2023
Single Cell Gene Expression Flex + Multiplexed Protein
Single Cell Gene Expression Flex + Intracellular Protein

2024
GEM-X Universal Gene Expression (3' v4 and 5' v3)
GEM-X Universal Multiplex (3' and 5')
GEM-X Flex
GEM-X Flex + CRISPR
Chromium Xo
GEM-X Technology

10x GENOMICS

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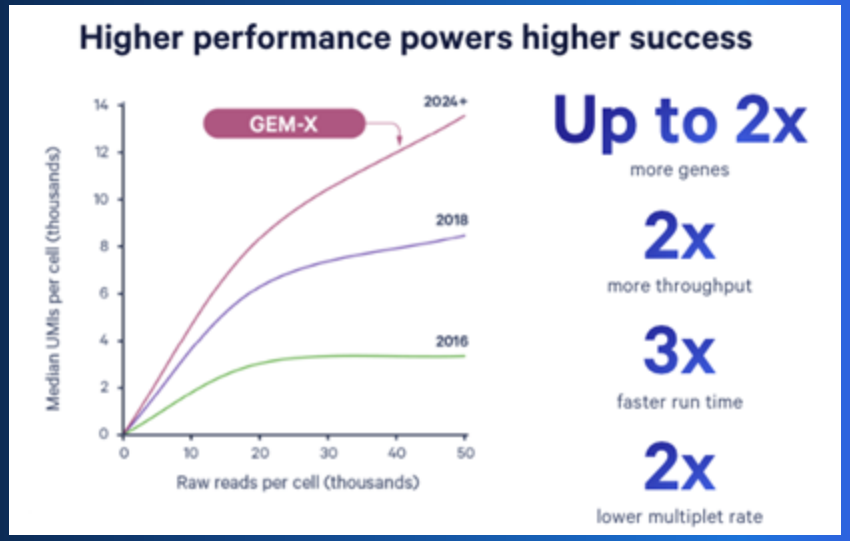
Formerly Single Cell Mutiome ATAC + Gene Expression

Epi ATAC
Formerly Single Cell ATAC

Enhanced performance, higher scale, lower cost

GEM-X Universal 3’ and 5’ Gene Expression assays



- **Substantially increased sensitivity:** Up to 2x more genes detected compared to previous versions
- **Built to scale:** 2-fold increase in cell throughput
- **More cost effective:** >2-fold reduction in cost per cell
- **Enhanced data quality:** 2-fold reduced multiplet rate
- **Maximum sample recovery:** Recover up to 80% of cells
- **Improved robustness:** Redesigned microfluidics

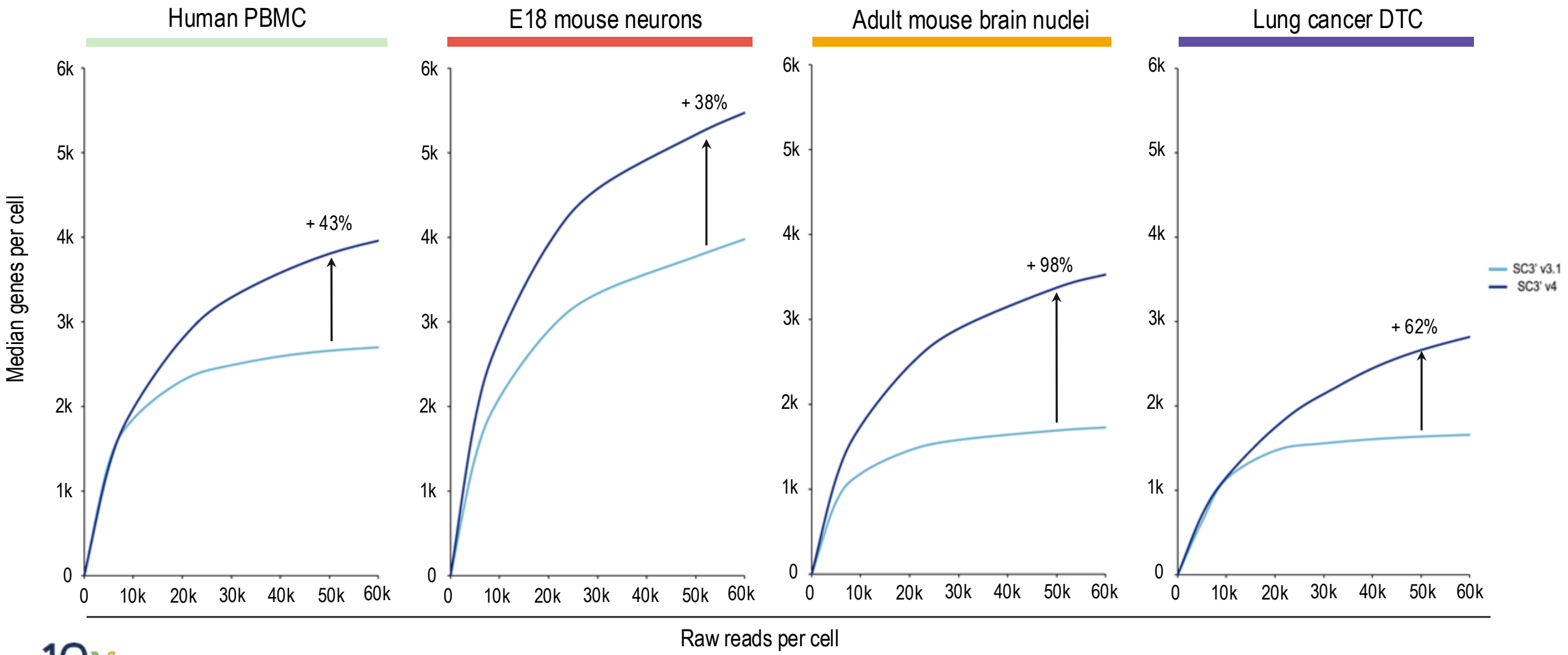
- Powered by **GEM-X Technology**

10X GENOMICS

Fold-changes represent improvements compared to previous Next GEM assay versions

Substantially improved gene sensitivity

GEM-X Universal 3’ Gene Expression v4



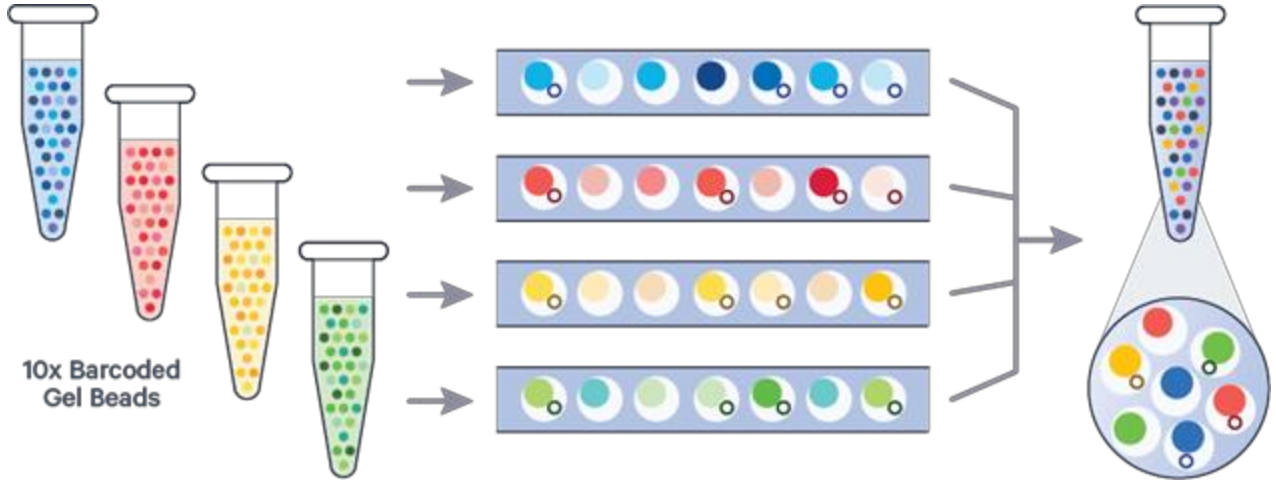
Introducing GEM-X Universal Multiplex

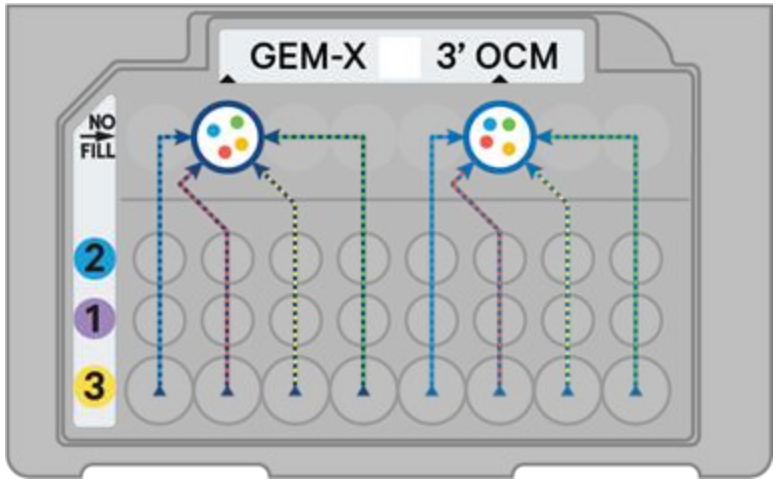
Easy, accessible single cell multiplexing.
No extra steps.
No extra costs.

Available for pre-order now, shipping November 2024

GEM-X Universal Multiplex workflow

Streamlined on-chip multiplexing (OCM) workflow





Co-partition cells from four samples, collect all GEMs in the same recovery well, and demultiplex samples computationally after sequencing.

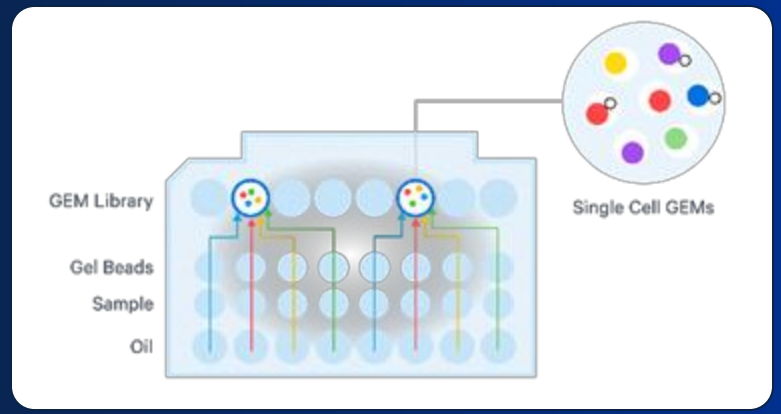
Simplified multiplexing approach

- ✓ Eliminates need for upstream sample tagging
- ✓ Flexible across different sample types (ex. non-human/mouse or nuclei)
- ✓ Supports lower cell inputs compared to traditional multiplexing methods

Lower cost per sample with on-chip multiplexing

GEM-X Universal 3’ and 5’ Gene Expression Multiplex

On-chip multiplexing workflow



Co-partition cells from four samples, collect all GEMs in the same recovery well, and demultiplex samples computationally after sequencing

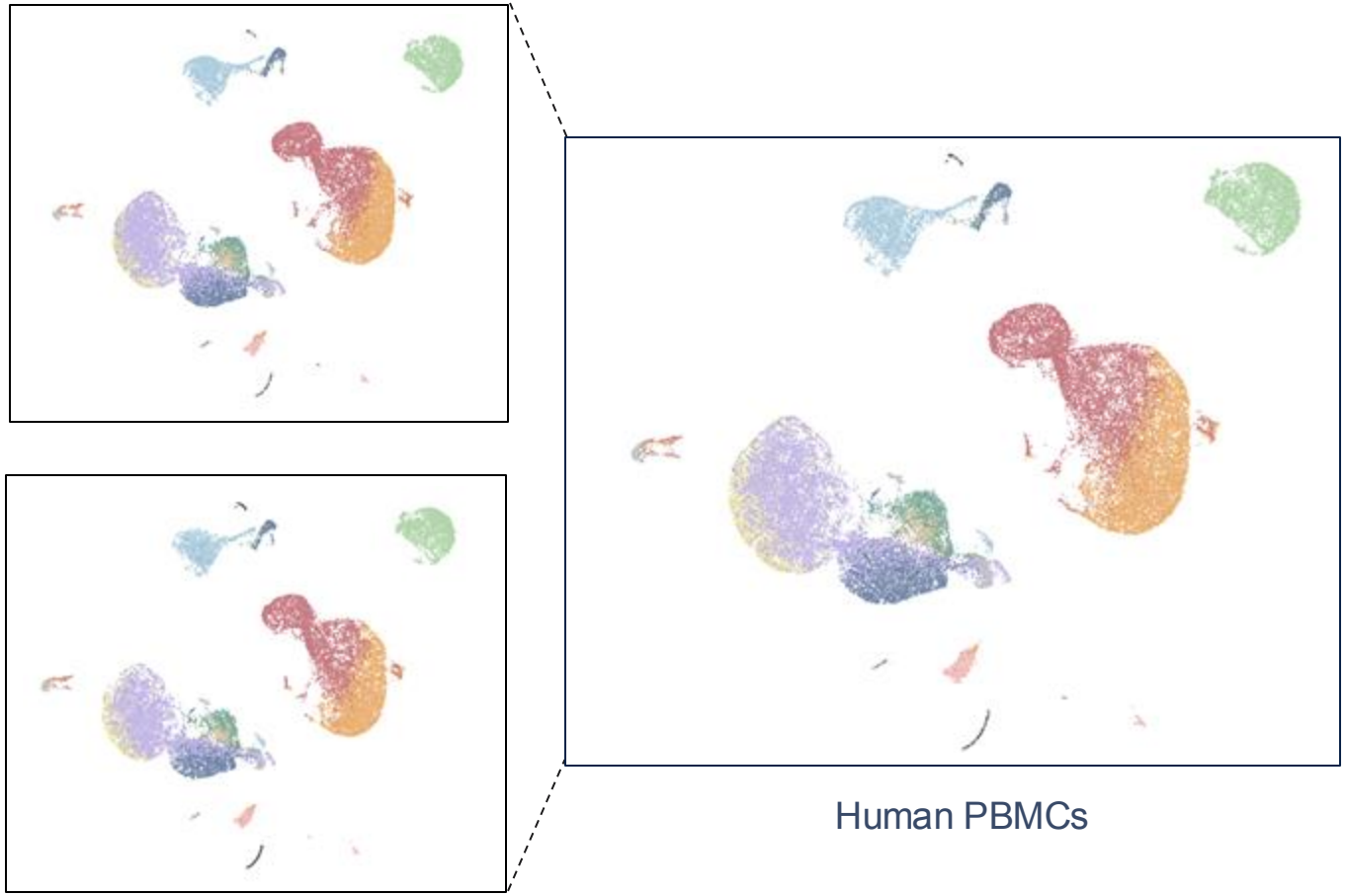
- **Unmatched GEM-X performance**
- **Easy multiplexing** - no extra steps, no extra costs
- **High cell recovery** with low cell inputs
- **Significantly lower cost per sample**
  - Process up to 8 samples per chip, 40K cells per chip
  - Multiplex 4 samples per GEM reaction, 5K cells/sample
  - Compatible with: Diverse species, low input samples, challenging sample types (including nuclei)

GEM-X Universal Multiplex delivers high performance data

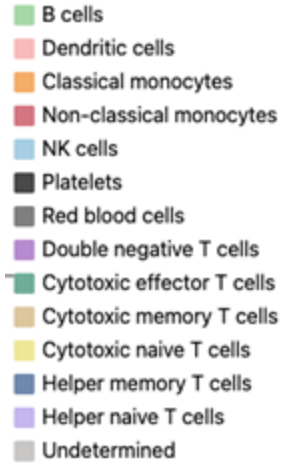
Consistent cell type proportions are obtained regardless of throughput methods

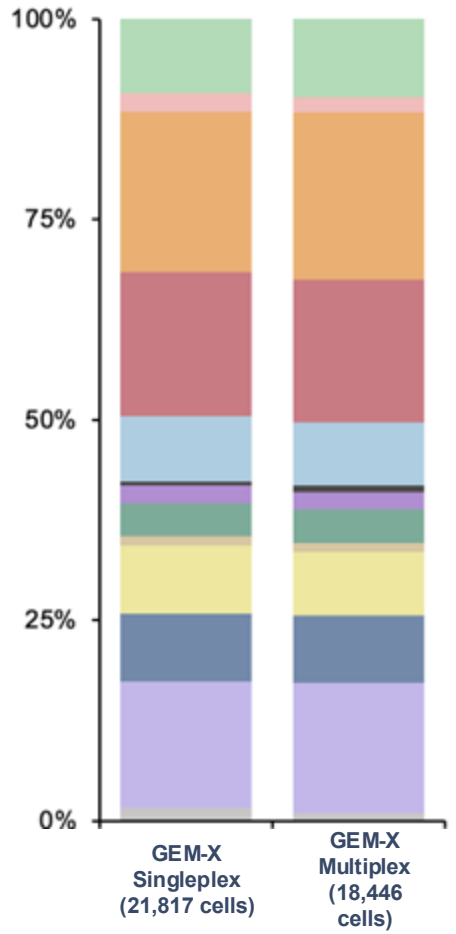
GEM-X 5’ Singleplex

GEM-X 5’ Multiplex



Human PBMCs





Introducing new Chromium Single Cell product families

Universal Assays

Universal 3’ Gene Expression
Formerly Single Cell Gene Expression

Universal 5’ Gene Expression
Formerly Single Cell Immune Profiling

Flex Assays

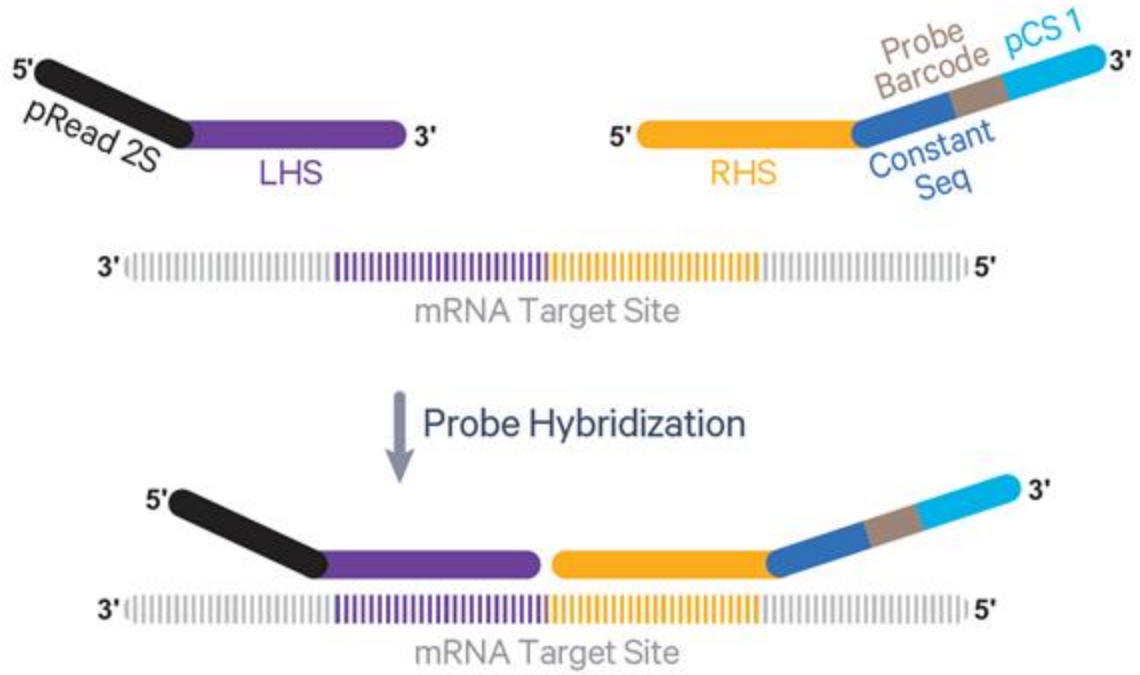
Flex Gene Expression
Formerly Single Cell Gene Expression Flex (or Fixed RNA Profiling)

Epi Assays

Epi Multiome ATAC + Gene Expression
Formerly Single Cell Mutiome ATAC + Gene Expression

Epi ATAC
Formerly Single Cell ATAC

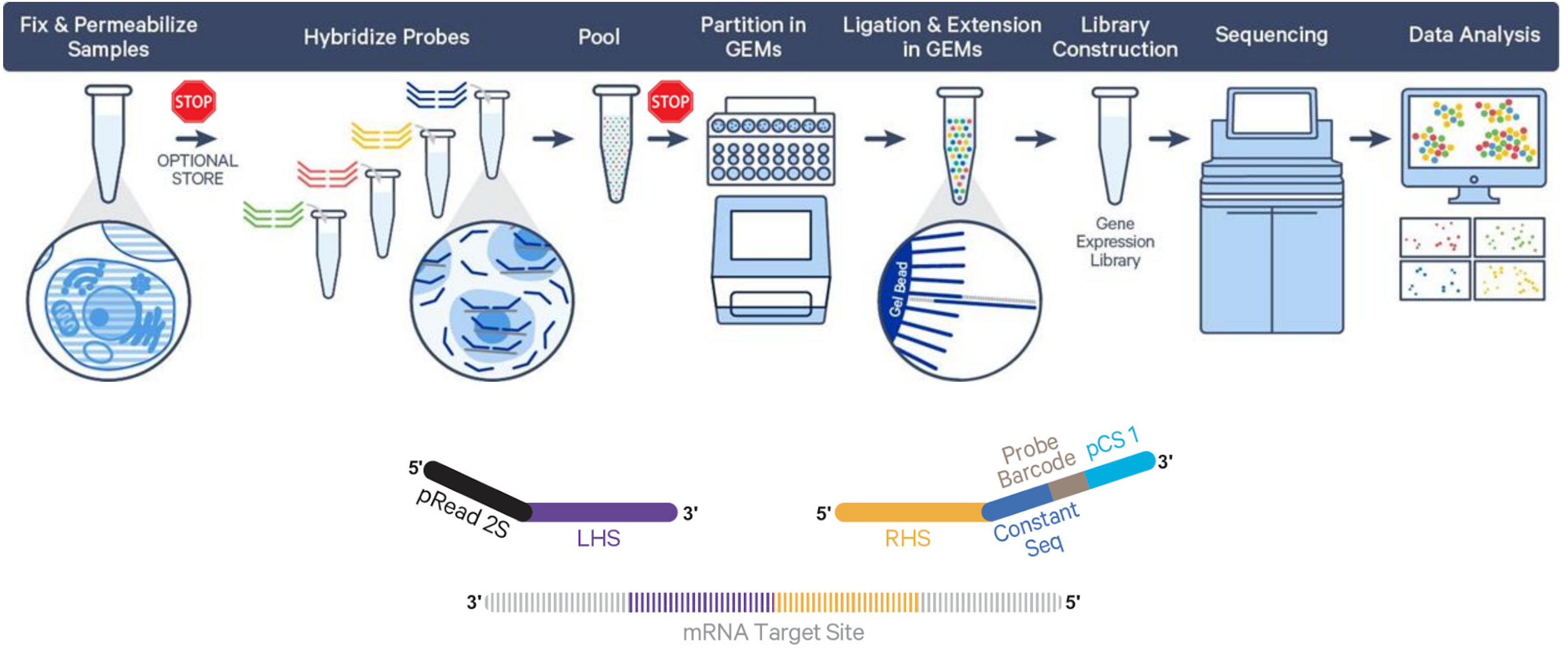
Flex Gene Expression - A novel probe-based design improves access and performance across all sample types



Innovative probe design enables

- Compatibility with low quality samples (probe footprint is only 50nt)
- Maximum sensitivity (three probe pairs per gene)
- Scale at ease (in-line multiplexing)

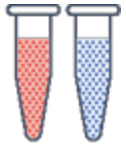
Streamlined Flex Gene Expression workflow



Flex Gene Expression – any sample at any scale

Broad sample compatibility

Fresh tissue
Frozen tissue



Cell suspensions
Nuclei suspensions

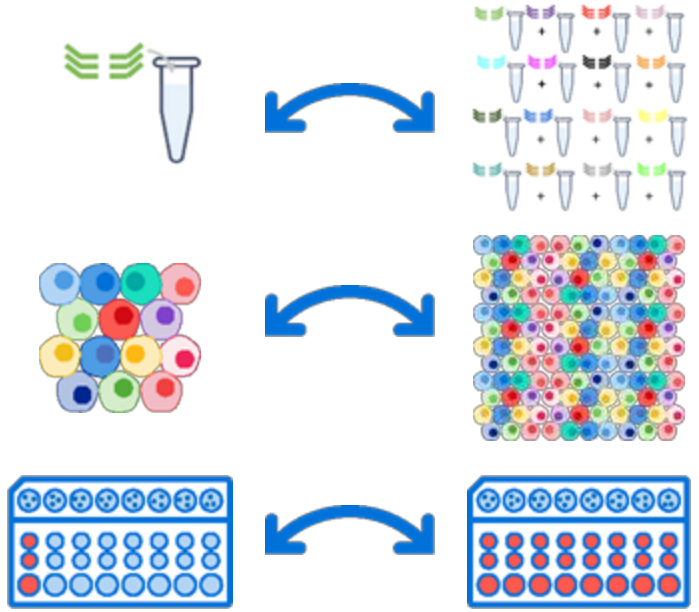
Whole blood

FFPE tissue

In-line multiplexing

- Up to 16 samples per channel

Flexible project input



- Millions of cells per chip
- Up to 128 samples per chip

10X GENOMICS

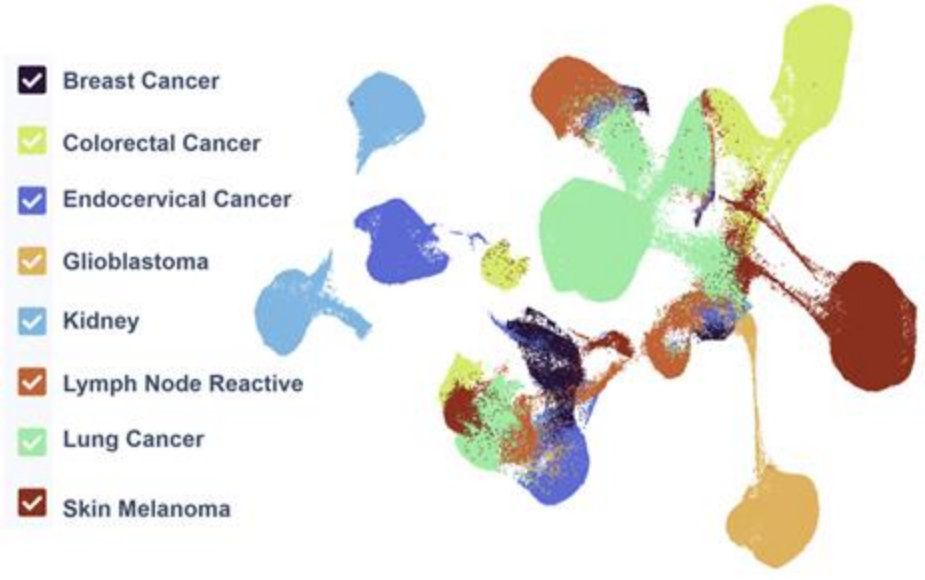
Introducing GEM-X Flex

Unprecedented scale.
Ultimate flexibility.
Incredible cost savings.

Available now!

GEM-X Technology: High performance, low cost, mega scale

Introducing GEM-X Flex Gene Expression



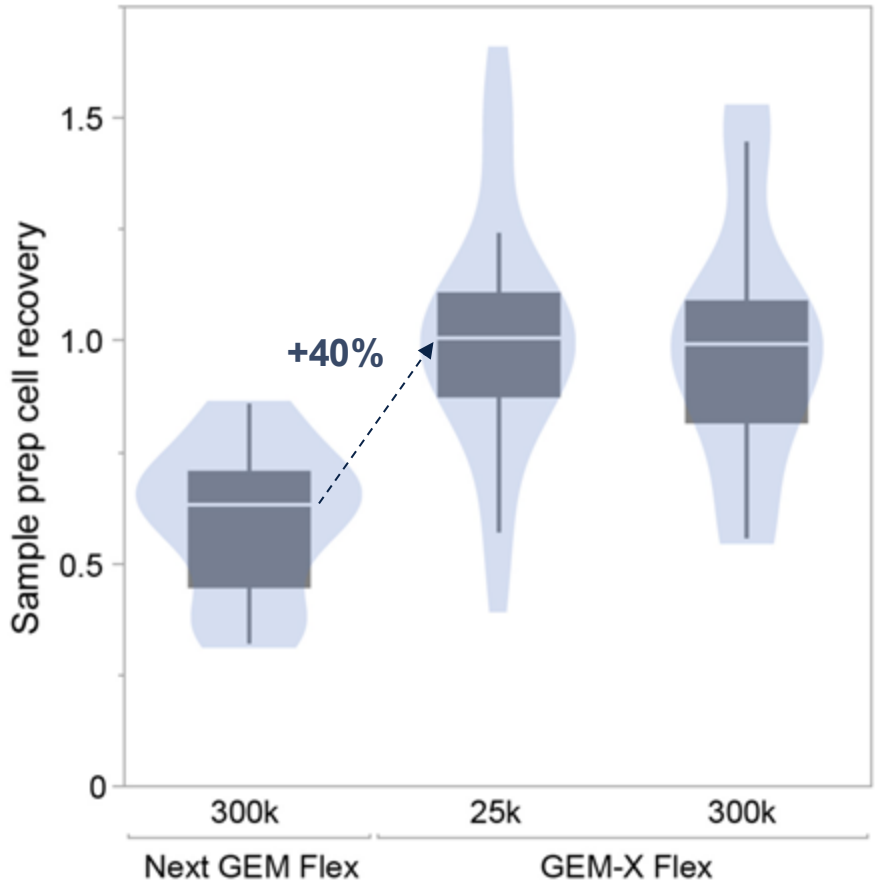
- **4x lower cell input recommendation:**

  From 100K cells → 25K cells/sample

- **Built to scale:** 2-fold increase in cell throughput - up to 320,000 cells per channel, for up to 2.56M cells per run, run up to 128 samples in parallel
- **More cost effective:** >2-fold reduction in cost per cell
- **Maximum sample recovery:** during sample preparation (up to 80%) and single cell partitioning (up to 80%)
- **Improved assay robustness:** Redesigned microfluidics

Substantially improved sample preparation cell recovery

Sample preparation enhancements boost recovery, particularly with challenging samples like FFPE



- Sample preparation improvements result in **up to 40% increase** in sample prep cell recovery compared to Next GEM Flex
- Substantially improved recovery for dissociated tissue, FFPE, and nuclei

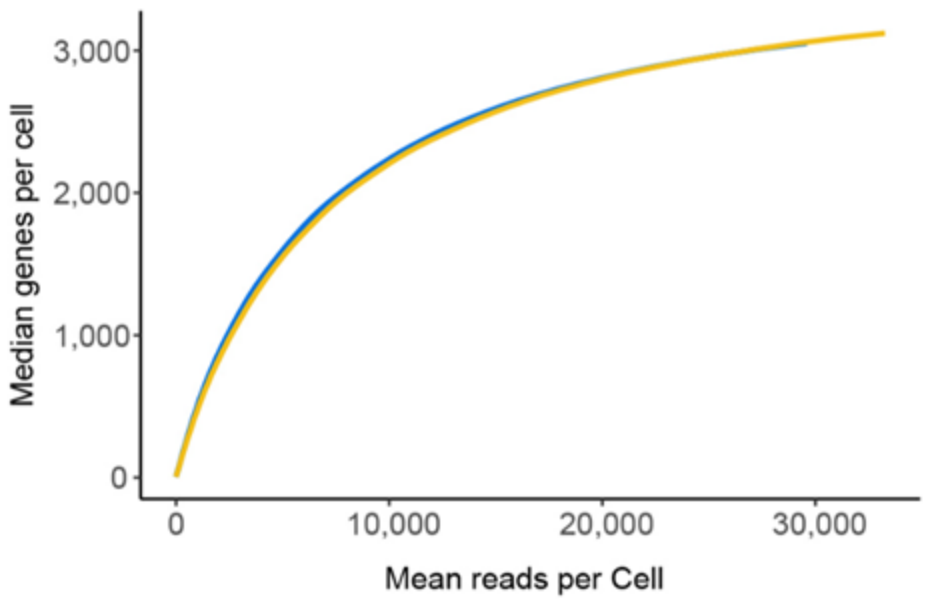
Lower cell input recommendations
(25K cells/sample)

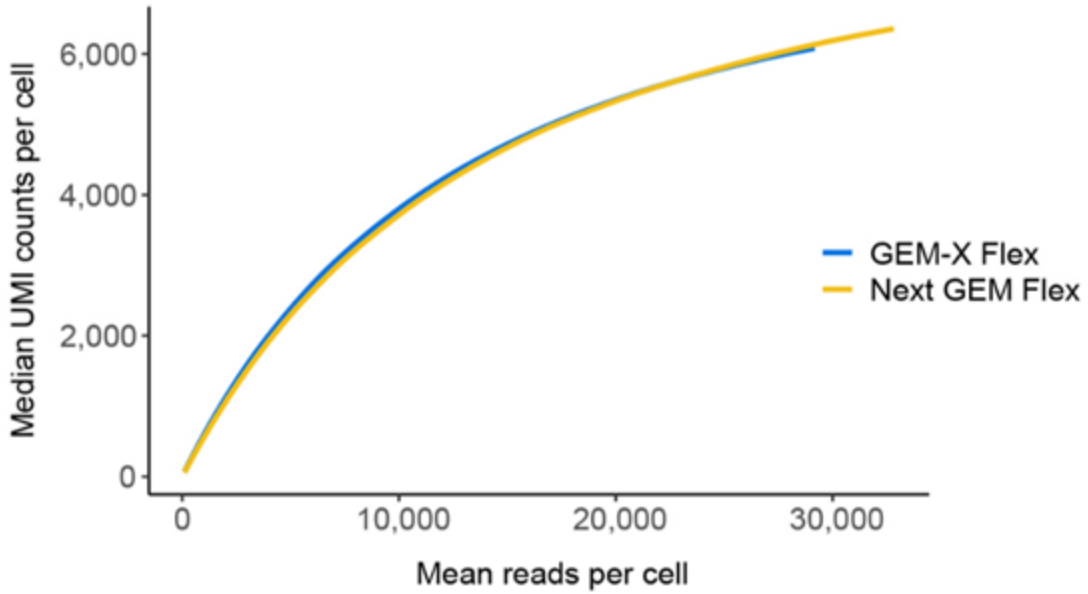
Making fixed SC more accessible for limited samples

GEM-X Flex delivers consistent data compared to Next GEM

GEM-X Flex shows consistent gene and transcript sensitivity

Human PBMCs



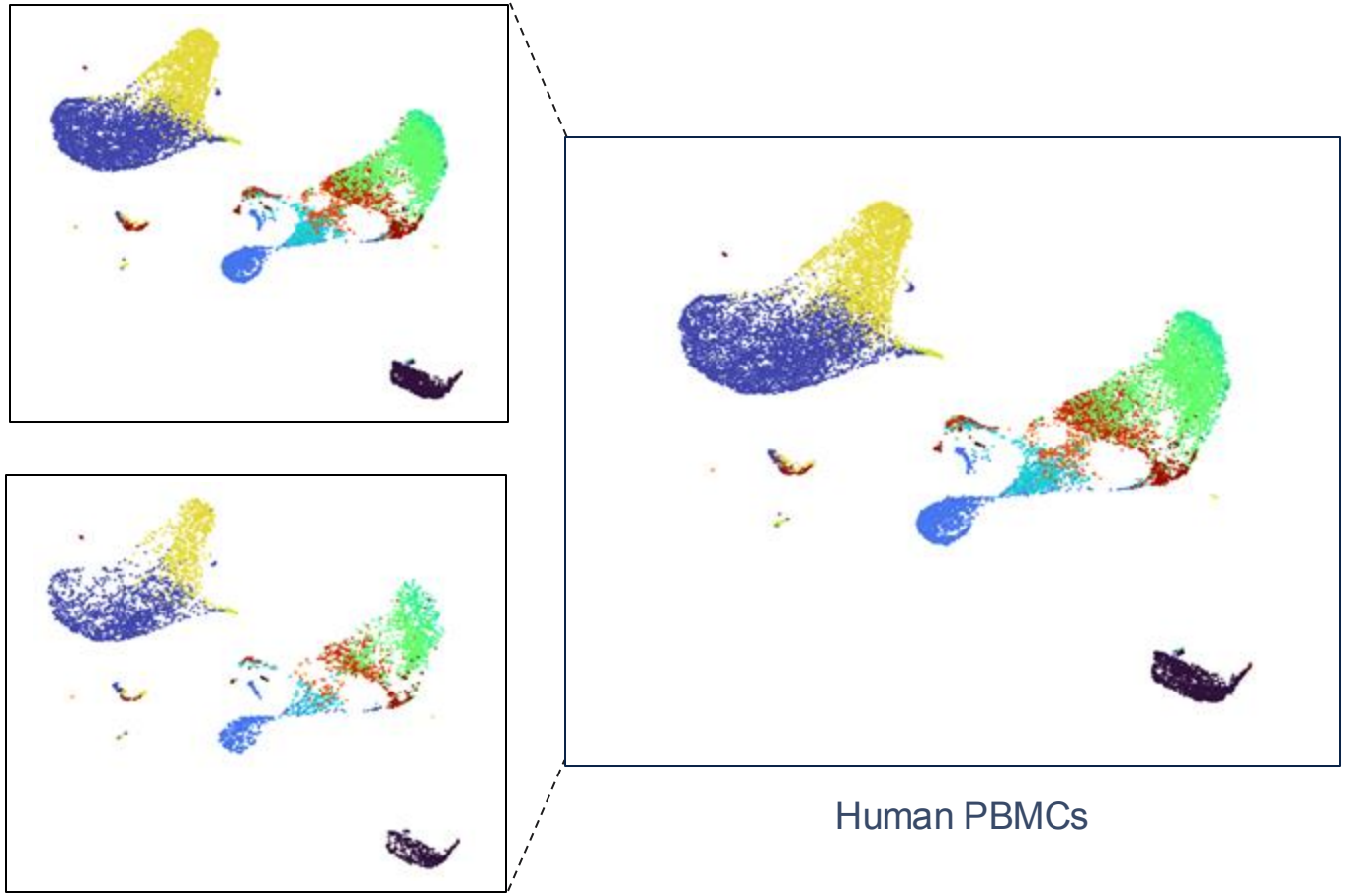


GEM-X Flex delivers consistent data compared to Next GEM

GEM-X Flex recovers consistent cell subpopulations and cell proportions

GEM-X Flex

Next GEM Flex



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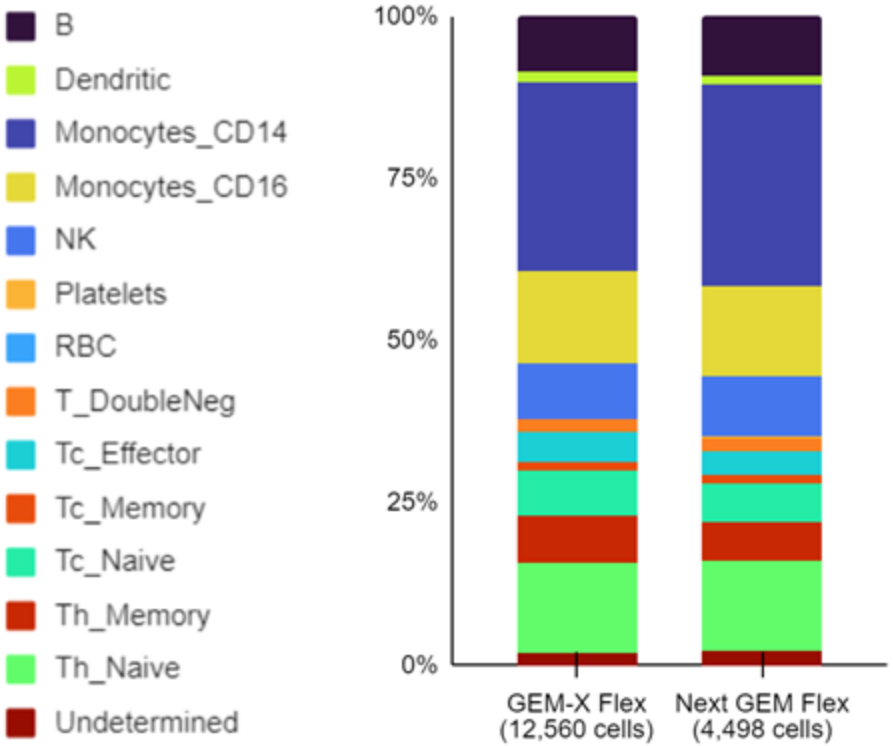
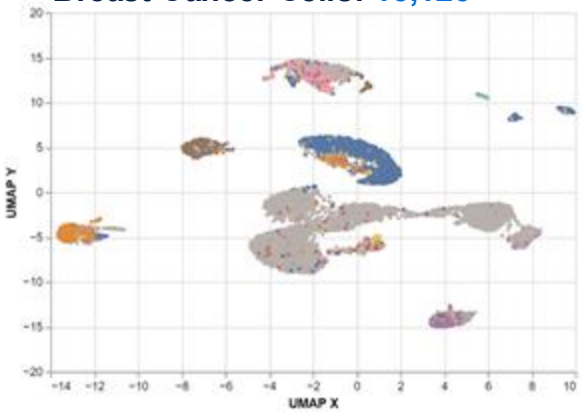


GEM-X Flex enables large scale studies at low cost per cell

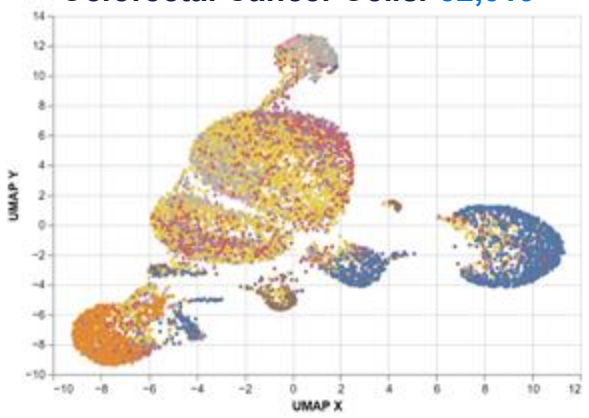
High throughput runs with 320K cells/channel and up to 2.56M cells/chip

8 FFPE tissues → across 2 barcodes, 20K cells per bc → **16-plex format** → **~320K cells in 1 channel**

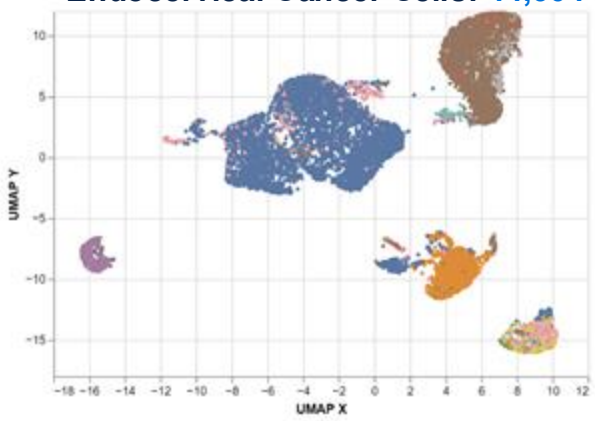
Breast Cancer Cells: 15,123



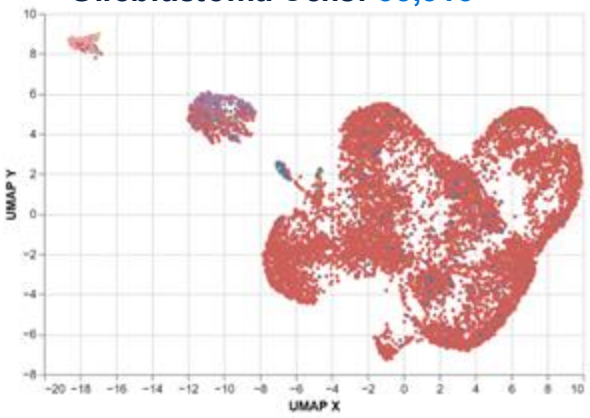
Colorectal Cancer Cells: 52,619



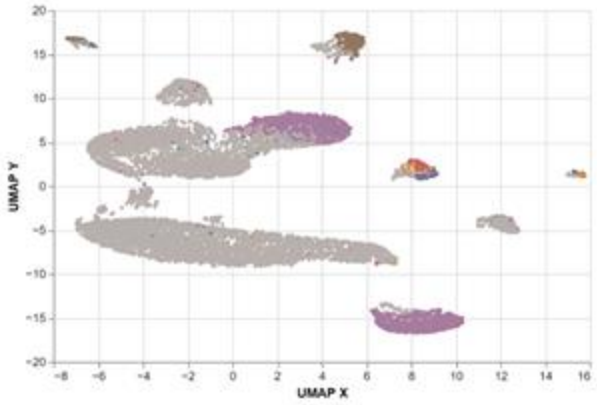
Endocervical Cancer Cells: 44,604



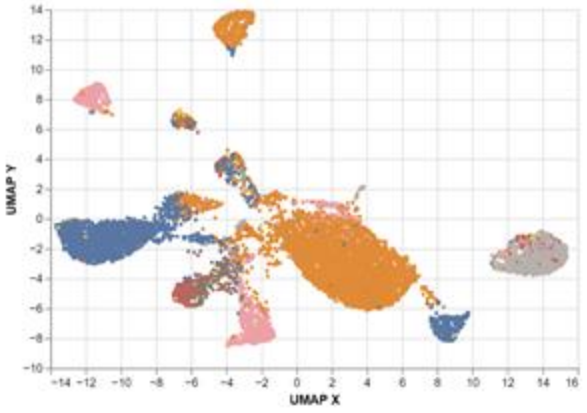
Glioblastoma Cells: 33,313



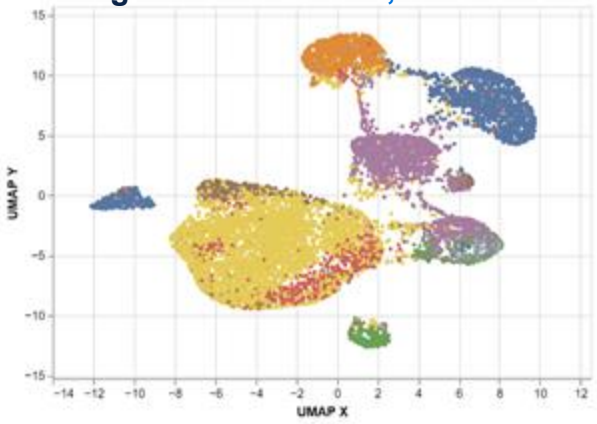
Healthy Kidney Cells: 33,676



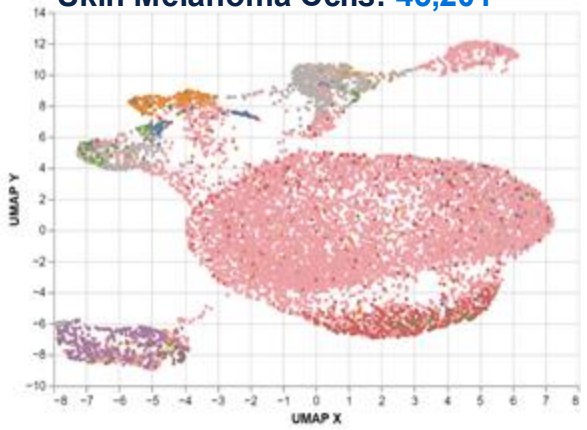
Reactive Lymph Node Cells: 31,231



Lung Cancer Cells: 69,309



Skin Melanoma Cells: 45,201



Automated Cell Annotation

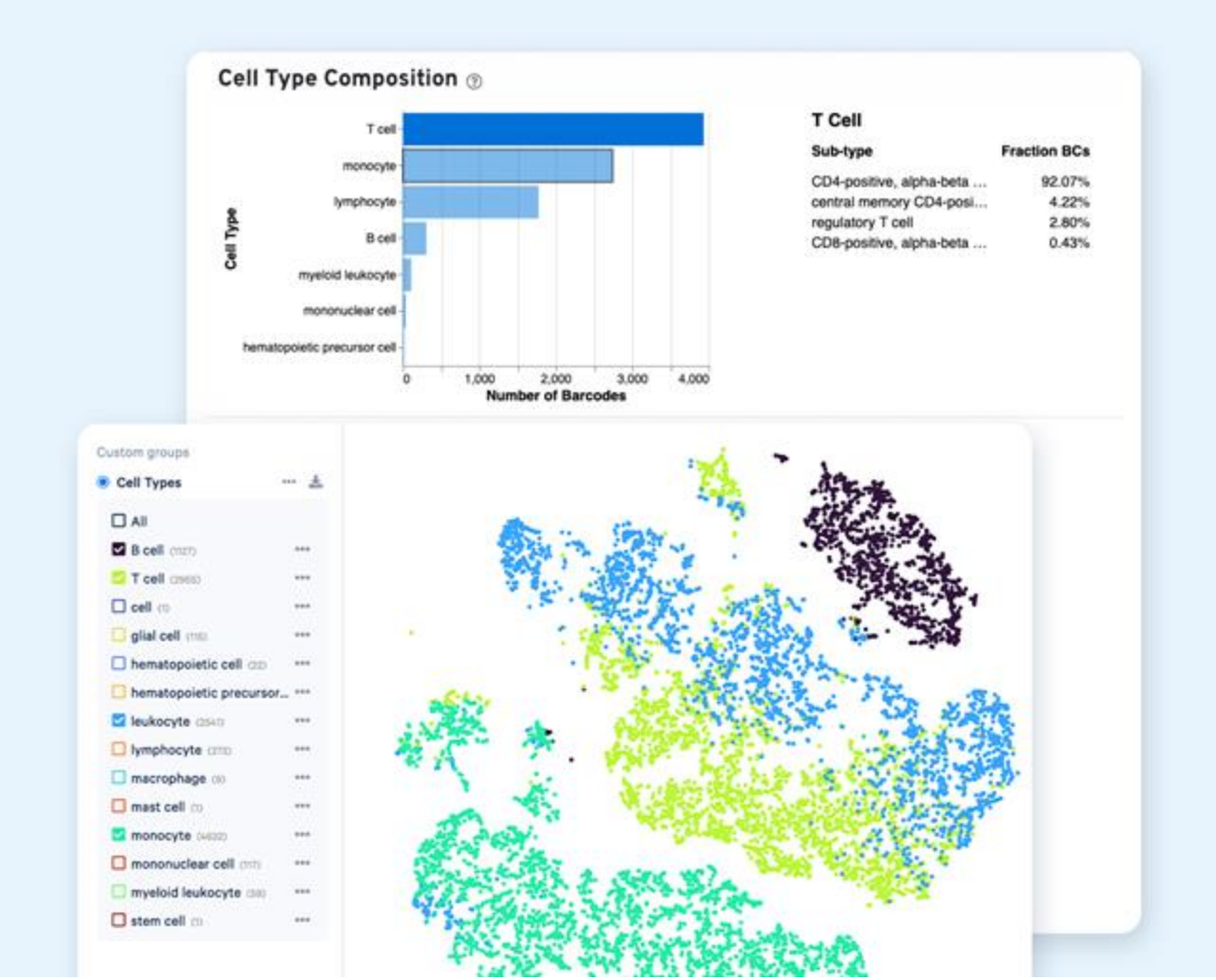
High level cell typing (e.g. T cell) creates an easy starting point for data analysis

Instant visualization in Loupe Browser without manual steps

More accurate insights with annotations from CELLxGENE database

Beta offering available now on 10x Cloud!

Annotation was performed using a model that was co-developed by 10x Genomics and the Cellarium AI Lab at the Data Sciences Platform of the Broad Institute.



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Driving the next step-up in scale

Low-cost assays at scale

Profile hundreds to millions of cells across one to hundreds of samples per run

Highest data quality

Long-trusted innovator in single cell analysis for quality, sensitivity, robustness, and throughput

Compatible across a wide range of species and sample types

Human to plants, insects to non-human primates; from cell suspensions, fresh or frozen tissue, and FFPE

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Transcriptomic
Epigenomic (ATAC)
Proteomic
CRISPR
Immune profiling (VDJ)