10x GENOMICS

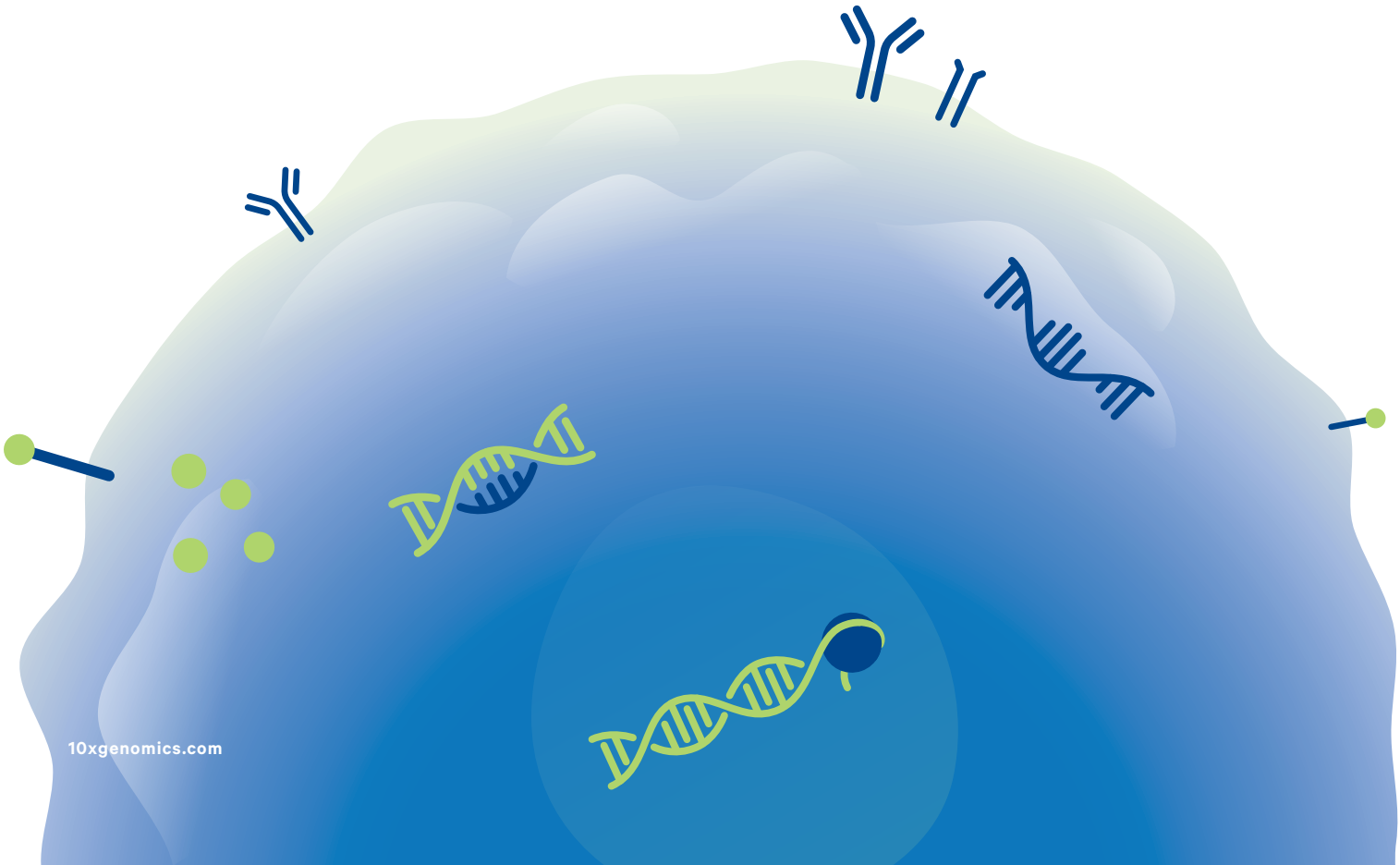
Single Cell Buyer's Guide

Gene Expression

Immune Profiling

Epigenomic Profiling

Protein Expression



Introduction

Why single cell sequencing?

Cell heterogeneity is a key contributor to biological complexity that is often masked by bulk techniques, like RNA sequencing (RNA-seq) or microarray analysis. Rather than providing an average snapshot of how cells work, single cell sequencing technology gives researchers the ability to more fully characterize tissue heterogeneity, identify rare cell types, and dissect molecular mechanisms cell by cell. This high level of resolution leads to groundbreaking insights, as evidenced by over 2,500 publications featuring 10x Genomics technology, the majority of which use single cell approaches.

Single cell publications featuring 10x Genomics technology

2,100+
TOTAL SINGLE CELL PUBLICATIONS

nature **108**

Cell **125**

Science **32**

How does it work?

Single cell sequencing starts with a suspension of single cells or nuclei. Droplets containing a single cell or nucleus are generated using advanced microfluidics with a Chromium instrument. Library construction follows a streamlined workflow. After sequencing, data can be processed and analyzed using our integrated data analysis pipelines and visualization software—intuitive enough for novice users yet powerful enough for the experts. Support resources provide guidance for the entire workflow, from sample preparation to data analysis.

Tackle your single cell experiments confidently with personalized support and detailed guidance across an end-to-end workflow.

Single cell product offerings

10x Genomics provides robust solutions that let you analyze gene and protein expression, perform comprehensive immune phenotyping, and map regions of open chromatin, all at single cell resolution.

Gene Expression

Perform molecular and cellular characterization of cells at scale with single cell RNA-sequencing for whole transcriptome or targeted gene expression.

Immune Profiling

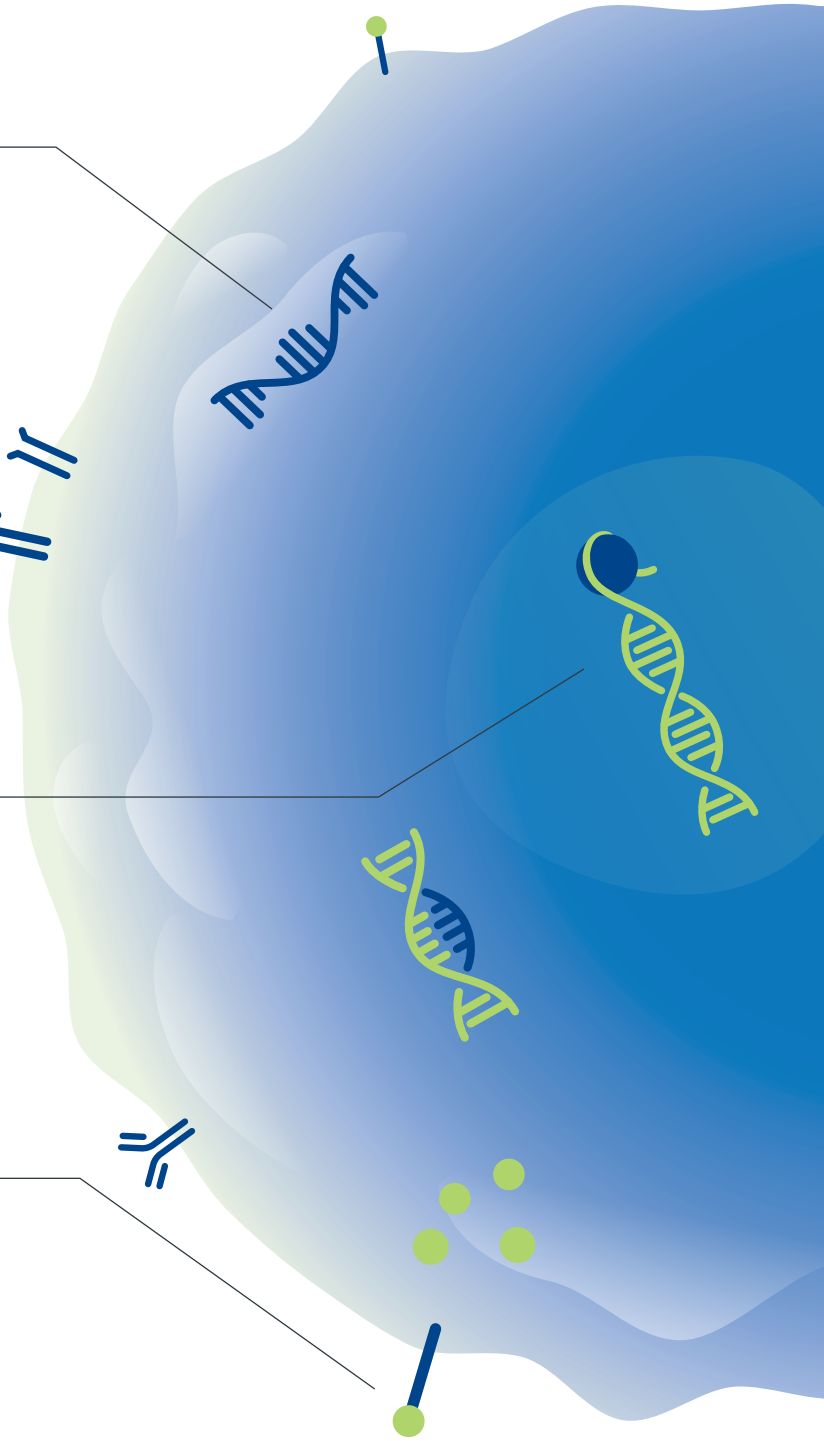
Gain a comprehensive view of the immune system with paired, full-length receptor sequences from T and/or B cells, surface protein expression, antigen specificity, and gene expression, all from a single cell.

Epigenomic Profiling

Uncover hidden insights with single cell epigenomic profiling using the assay for transposase-accessible chromatin, ATAC-seq, alone or in combination with single cell RNA-seq to simultaneously measure chromatin accessibility and gene expression.

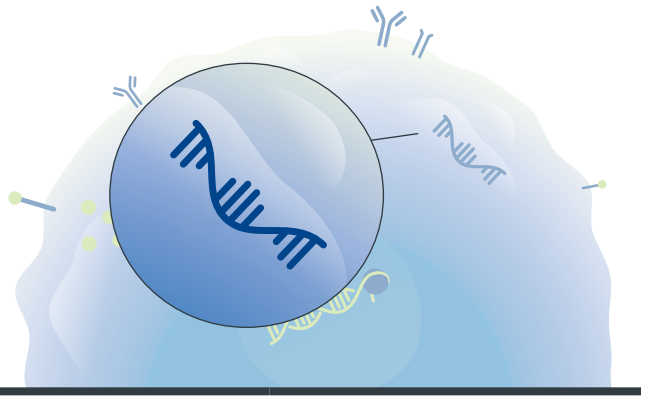
Protein Expression

Reveal cell phenotypes and uncover functional information at single cell resolution with simultaneous measurement of hundreds of cell surface proteins and gene expression.



Single Cell Gene Expression

Characterize cellular heterogeneity, explore mechanisms driving development and disease, and trace cell lineages with comprehensive 3'- or 5'-based transcriptome sequencing at single cell resolution for hundreds to hundreds of thousands of cells.

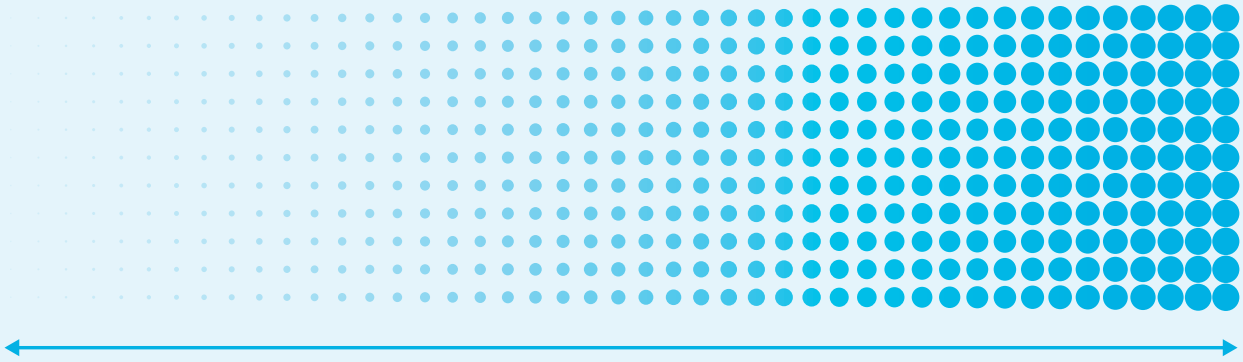


At-a-glance comparison

	Single Cell Gene Expression	Single Cell Immune Profiling	Single Cell Multiome ATAC + Gene Expression
Description	A flexible solution providing 3' gene expression with multiomic capabilities	Enhanced immune profiling combining 5' gene expression with multiomic profiling	Multiomic profiling of 3' gene expression and open chromatin
Additional multiomic capabilities	Cell Surface Protein CRISPR Screening	Cell Surface Protein Antigen Specificity BCR/TCR sequencing	-
Extensions	Sample multiplexing Automated workflow	Automated workflow	-
Targeted gene expression panels	Human pre-designed and custom; Mouse custom	Human pre-designed and custom; Mouse custom	-
Throughput	Low, standard, or high	Standard or high	Standard
Sample & species compatibility	Cells or nuclei Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Demonstrated on multiple species, including human, mouse, and rat	Cells Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Amplification of human or mouse TCR/BCR sequences Demonstrated on multiple species, including human and mouse	Nuclei Demonstrated with cell lines, primary cells, cryopreserved samples, and fresh- and flash-frozen tissue Demonstrated on multiple species, including human, mouse, and rat
Analysis software	Cell Ranger Cloud Analysis	Cell Ranger Cloud Analysis	Cell Ranger ARC
Visualization software	Loupe Browser	Loupe Browser Loupe V(D)J Browser	Loupe Browser
Resources	Product sheet Kits and part numbers	Product sheet Kits and part numbers	Product sheet Kits and part numbers

Match the scale you need for your Single Cell Gene Expression studies

From pilot experiments to comprehensive translational studies, Single Cell Gene Expression lets you scale up or down with ease. Choose the kit and instrument that work for you and your research aims.



Small scale

- Analysis of 100–1,000 cells per sample; up to 4 samples per chip
- Preliminary data for pilot studies or grant applications
- Optimization of experimental design or sample preparation
- Studies with low cell throughput needs

Kit: Chromium Single Cell Gene Expression LT

Instrument: Chromium X, Chromium iX, Chromium Controller

Standard scale

- Analysis of 500–10,000 cells per sample; up to 8 samples per chip
- Option to combine with 3' CellPlex sample multiplexing to increase cell and sample throughput
- Comprehensive cell or tissue characterization
- Rare cell type detection
- Analysis of precious samples with limited cell number
- Most research applications

Kit: Chromium Single Cell Gene Expression, with optional 3' CellPlex for sample multiplexing

Instrument: Chromium X, Chromium iX, Chromium Connect, Chromium Controller

Large scale

- Analysis of 2,000–20,000 cells per sample; up to 16 samples per chip
- Option to combine with 3' CellPlex sample multiplexing and recover up to 730,000 singlets* per chip with increased sample throughput
- In-depth characterization of numerous complex samples
- Large-scale single cell CRISPR screens
- Analysis of very rare cell types that require higher cell throughput
- Multi-sample or time course validation studies

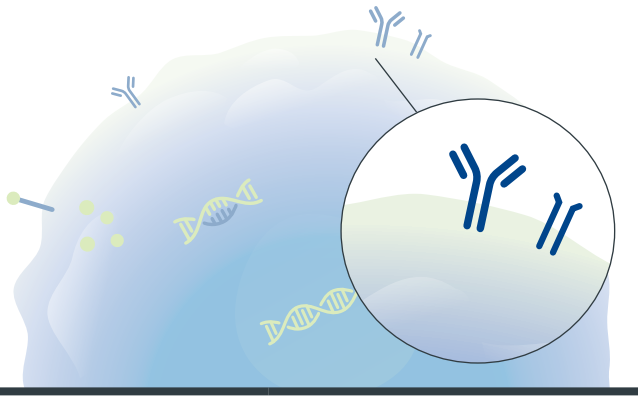
Kits: Chromium Single Cell Gene Expression HT, with optional 3' CellPlex for sample multiplexing

Instrument: Chromium X

*Singlets are single cells or nuclei captured after multiplet removal.

Single Cell Immune Profiling

Reveal the full diversity of the immune system to understand clonal expansion, accelerate immunotherapy, and investigate disease states.

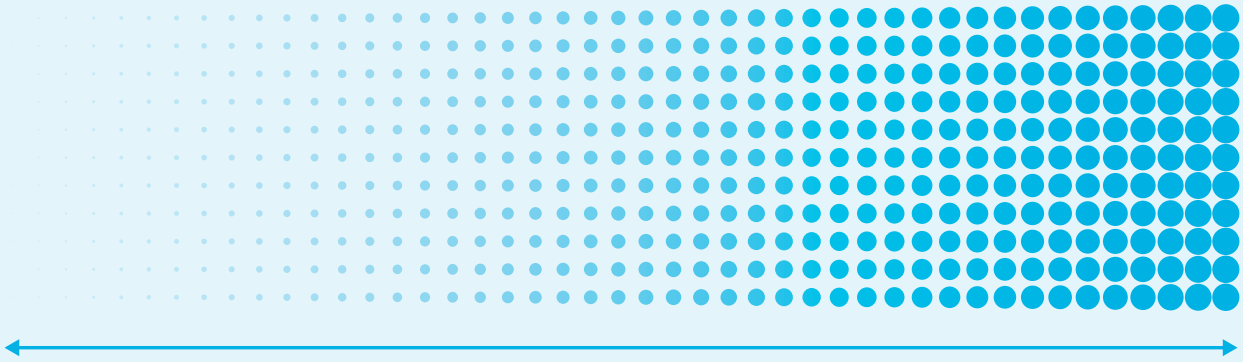


At-a-glance comparison

	Immune Receptor Profiling	Immune Receptor Mapping	Single Cell 5' Gene Expression
Description	Perform BCR/TCR sequencing to obtain paired, full-length receptor sequences from T cells and/or B cells with complete isotype resolution	Determine antigen specificity by mapping B- and T-cell receptors with antigens at scale	Study innate and adaptive immunity by combining single cell 5' gene expression with multiomic profiling
Additional multiomic capabilities	Antigen Specificity Gene Expression Cell Surface Protein	BCR/TCR sequencing Gene Expression Cell Surface Protein	Antigen Specificity BCR/TCR sequencing Cell Surface Protein
Extensions	Automated workflow	-	Automated workflow
Targeted gene expression panels	Human pre-designed and custom; Mouse custom	Human pre-designed and custom; Mouse custom	Human pre-designed and custom; Mouse custom
Throughput	Standard or high	Standard or high	Standard or high
Sample compatibility	Cells Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Amplification of human or mouse TCR/BCR sequences Demonstrated on multiple species, including human and mouse	Cells Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Amplification of human or mouse TCR/BCR sequences Compatible across species, including mouse and human	Cells or nuclei Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Demonstrated on multiple species, including human and mouse
Analysis software	Cell Ranger Cloud Analysis	Cell Ranger	Cell Ranger Cloud Analysis
Visualization software	Loupe Browser Loupe V(D)J Browser	Loupe Browser Loupe V(D)J Browser	Loupe Browser Loupe V(D)J Browser
Resources	Product sheet Kits and part numbers	Product sheet Kits and part numbers	Product sheet Kits and part numbers

Adapt the scale you need for immune cell profiling

From clonotyping studies to large-scale antibody and TCR discovery projects, Single Cell Immune Profiling lets you scale up easily. Select the kit and instrument that enable your projects, from discovery to translational research.



Standard scale

- Process 500–10,000 cells per sample; up to 8 samples per chip
- Explore adaptive and innate immune cell diversity
- Identify and characterize rare cell types and biomarkers
- Analyze tissue microenvironments, disease progression, and drug immune response
- Characterize immune response to infection by measuring clonal expansion and immune cell phenotypes

Kit: Chromium Single Cell Immune Profiling

Instrument: Chromium X, Chromium iX, Chromium Connect, Chromium Controller

Large scale

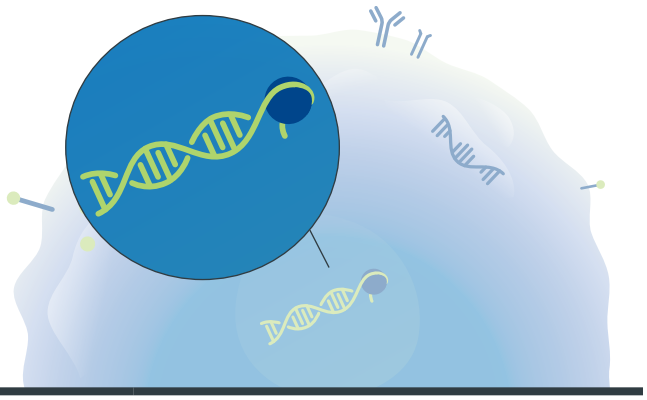
- Process 2,000–20,000 cells per sample; up to 16 samples per chip
- Perform large-scale antibody and TCR discovery for novel antigens
- Detect ultra-rare cell populations with increased throughput and multiomic readouts
- Perform large-scale time course experiments for clonal tracking
- Achieve economy of scale for immune repertoire profiling with Targeted Gene Expression and simultaneous marker protein profiling

Kit: Chromium Single Cell Immune Profiling HT

Instrument: Chromium X

Single Cell Epigenomic Profiling

Unmask epigenomic profiles, explore gene regulatory interactions, and resolve cell lineage relationships to transform your understanding of biology and uncover hidden insights.

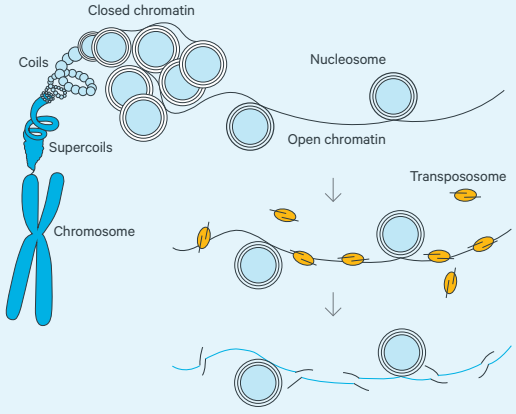


At-a-glance comparison

	Single Cell Multiome ATAC + Gene Expression	Single Cell ATAC
Description	Simultaneously profile single cell 3' gene expression and open chromatin from the same nucleus	Profile chromatin accessibility with single cell resolution
Chromatin accessibility profiling	Yes	Yes
Transcriptional profiling	Yes	No
Throughput	Standard	Standard
Sample & species compatibility	Nuclei Demonstrated with cell lines, primary cells, cryopreserved samples, and fresh- and flash-frozen tissue Demonstrated on multiple species, including human and mouse	Nuclei Demonstrated with cell lines, primary cells, cryopreserved samples, and fresh- and flash-frozen tissue Demonstrated on multiple species, including human and mouse
Analysis software	Cell Ranger ARC	Cell Ranger ATAC
Visualization software	Loupe Browser	Loupe Browser
Resources	Product sheet Kits and part numbers	Product sheet Kits and part numbers

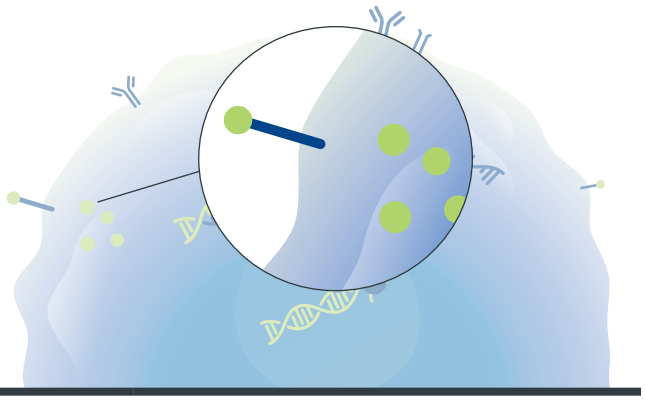
Why ATAC-seq?

The assay for transposase-accessible chromatin (ATAC) is a sequencing method that surveys the physical structure of the genome by identifying regions of open chromatin, where regulatory sequences are accessible to DNA-binding proteins. Single cell ATAC-seq can provide information about gene regulatory elements, including their cell-type specificity and binding site motifs.



Single Cell Protein Expression

Comprehensively resolve cell types and phenotypes, validate your single cell RNA-seq, and unravel cell signaling pathways to explore molecular mechanisms or transform drug discovery.

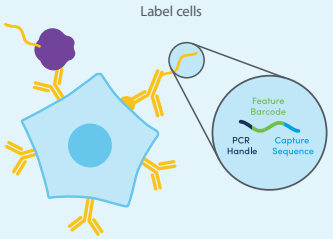


At-a-glance comparison

	Single Cell Gene Expression	Single Cell Immune Profiling
Description	A flexible multiomic solution providing single cell 3' gene expression and cell surface protein profiling	Enhanced immune profiling combining single cell 5' gene expression with cell surface protein profiling
Additional multiomic capabilities	-	Antigen Specificity BCR/TCR sequencing
Extensions	Sample multiplexing	-
Targeted gene expression panels	Human pre-designed and custom; Mouse custom	Human pre-designed and custom; Mouse custom
Throughput	Low, standard, or high	Standard or high
Sample & species compatibility	Cells Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Demonstrated on multiple species, including human and mouse	Cells Tested on diverse sample types, including cell lines, primary cells, and dissociated fresh tissue Amplification of human or mouse TCR/BCR sequences Demonstrated on multiple species, including human and mouse
Analysis software	Cell Ranger	Cell Ranger
Visualization software	Loupe Browser	Loupe Browser Loupe V(D)J Browser
Resources	Product sheet Kits and part numbers	Product sheet Kits and part numbers

Enabling multiomic cytometry

Unlike traditional flow cytometry, Single Cell Protein Expression from 10x Genomics uses Feature Barcode technology, leveraging oligonucleotide-tagged antibodies to simultaneously measure hundreds of proteins at once. With a sequencing-based readout, multiomic cytometry enables combined gene expression and protein profiling at single cell resolution for comprehensive cellular phenotyping at scale.



Instrumentation that works for you

Key to our single cell sequencing technology is the ability to generate tens of thousands of single cell partitions, each containing an identifying barcode for downstream analysis. Each of the Chromium instruments uses advanced microfluidics to perform single cell partitioning and barcoding in a matter of minutes.

Next-generation technology for ultimate single cell flexibility

The Chromium X Series is designed with modern functionality plus enhanced hardware technology to offer the most optimized approach to single cell studies, with the option to match the scale of single cell research at any level and enable routine high-throughput experiments. All of our single cell assays are supported on Chromium X Series instruments.

Learn more about the Chromium X Series

Automate your single cell workflows

Chromium Connect provides automation of the full single cell gene expression and immune profiling workflows, including cell partitioning and library construction, letting you go from single cell suspensions to up to eight sequencing-ready libraries with walk-away convenience.

Learn more about Chromium Connect

Tried and true technology for single cell studies

The Chromium Controller is our compact single cell instrument, with capacity for low- and standard-throughput solutions and support for all of our single cell assays.

Learn more about the Chromium Controller

Resources from 10x Genomics

We are dedicated to helping you get the most out of your 10x Genomics system by offering multiple helpful resources:

Technology brochure
Discover the power of single cell partitioning and learn how Next GEM technology enables integrated analysis of single cells at massive scale.

Learn more ⟶

10x Genomics publications
Get inspired by more than 2,500 peer-reviewed publications and search papers by product, research area, or sample type.

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Access our list of key partner products that have been certified compatible to work with our various solutions.

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10x Genomics library
Learn more about what you can do with our single cell solutions from our collection of product literature, application notes, and scientific posters.

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Keep up to date with the 10x Genomics Blog, where you'll find everything from tips and tricks to the latest 10x news.

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