

A clear path to gene function with single cell CRISPR screening

Single Cell 5' CRISPR Screening

Although pooled CRISPR screens offer a powerful method for identifying genes involved in complex biological mechanisms, such as cell proliferation, cell survival, and drug/toxin resistance, these screens provide limited insights into gene function. Chromium Single Cell CRISPR Screening offers deep characterization of perturbation effects by enabling whole transcriptome profiling of single cells for up to thousands of gene edits in one experiment. Leverage your existing CRISPR-Cas9 libraries for multiomic profiling with single cell resolution to analyze regulatory gene networks in development and disease, resolve complex pathways, and dissect cellular regulation.

Highlights

- Evaluate entire gene networks, key disease pathways, or specific gene functions with multiomic, single cell profiling of up to thousands of CRISPR-driven gene edits
- Perform large-scale pathway screens to access more information per target, enabling more confident decision making for drug candidates
- Validate hits from genome-wide association studies (GWAS) and obtain comprehensive functional information from CRISPR edits to elucidate gene function

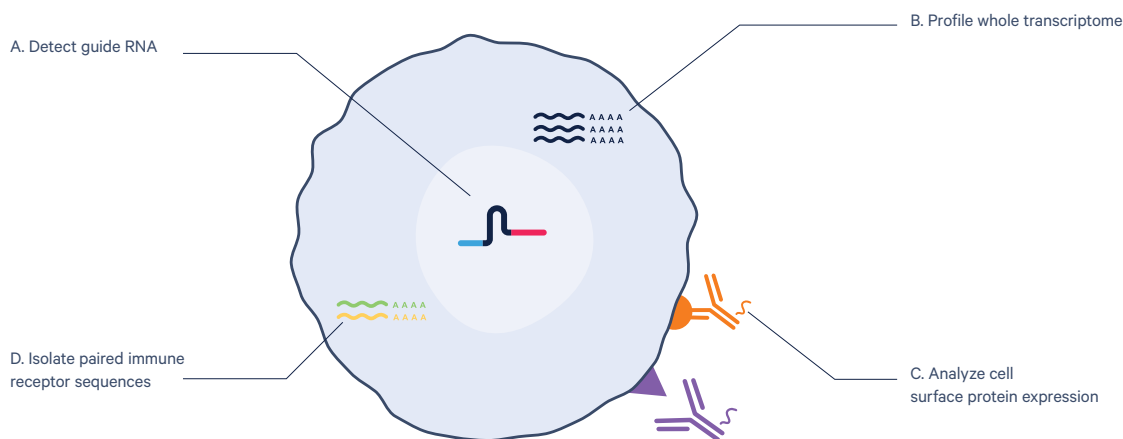


Figure 1. Chromium Single Cell CRISPR Screening enables high-throughput perturbation studies. Characterize perturbations at an even deeper level with Single Cell 5' Gene Expression, enabling detection of up to four modalities at single cell resolution, including guide RNAs (A), whole transcriptome gene expression (B), cell surface protein expression (C), and immune receptor sequences (D).

Product features

- Assess CRISPR perturbation phenotypes and gene expression simultaneously from the same cell to accelerate your functional genomics studies
- Screen thousands of genes in a single experiment, providing a holistic analysis of complex genetic pathways
- Access off-the-shelf compatibility with most CRISPR-Cas9 libraries, streamlining the path to single cell analysis
- Perform CRISPRko, CRISPRi, and/or CRISPRa screens, for flexibility to investigate a wide range of gene functions
- Leverage multiomic capabilities to simultaneously detect CRISPR guides, gene expression, cell surface proteins, including immune receptors from the same single cell for deeper characterization of cell types and states
- Apply easy-to-use data analysis and visualization software for powerful data interpretation

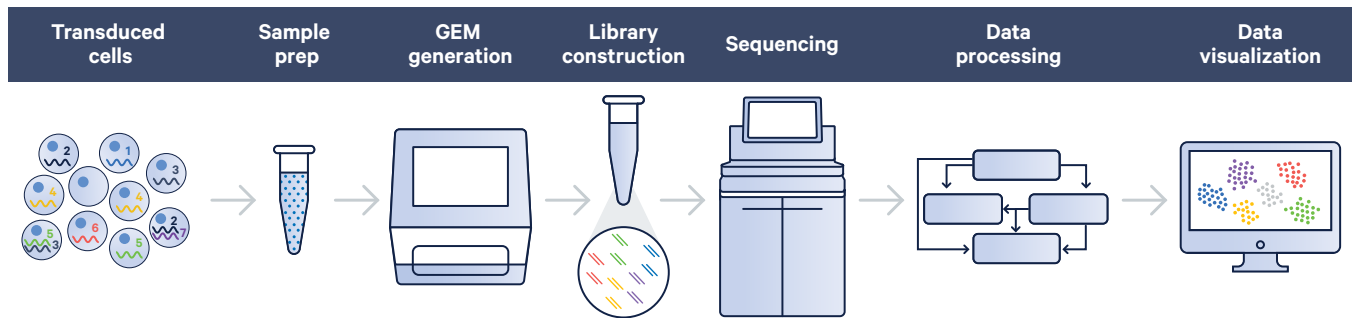


Figure 2. Efficient and streamlined workflow for high-throughput perturbation profiling. Cells expressing CRISPR-Cas9 are transduced with a pool of guide RNAs (gRNAs) before processing with the Single Cell 5' Gene Expression assay. After GEM generation with the Chromium instrument, separate libraries for CRISPR guide sequences, gene expression, and optional cell surface protein and immune receptor sequences can be constructed from a single sample, generating multiple readouts that can be linked back to the same single cell. Process data with Cell Ranger and visualize sample heterogeneity with Loupe Browser, our fully integrated and easy-to-use analysis and visualization software tools.

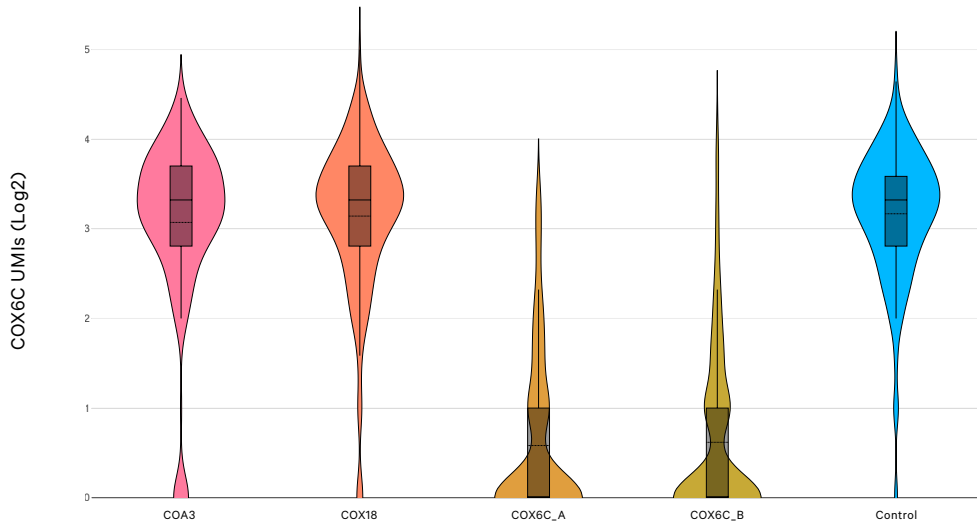


Figure 3. Violin plots demonstrate knockdown efficiency in a pooled CRISPR screen. Screening was performed on a human cell line (K562) constitutively expressing dCas9-KRAB. Data output from Loupe Browser shows UMI counts of the gene COX6C from cells containing experimental or control sgRNAs. Clear knockdown of COX6C is observed in the cell clusters that express the COX6C guide RNA.

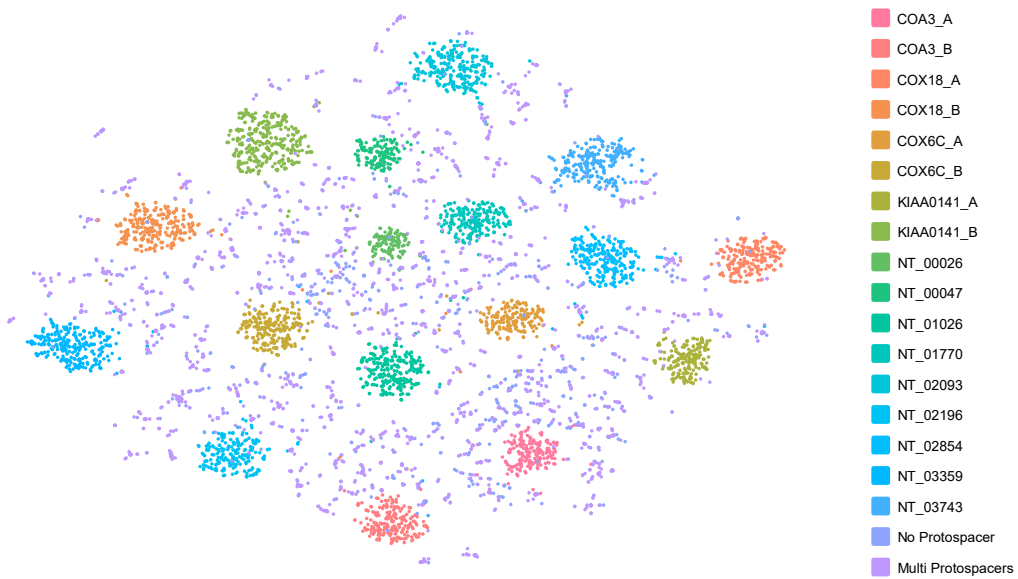


Figure 4. t-SNE plot of cells from the Single Cell 5' Gene Expression assay. Cells are grouped and colored according to guide identity (right legend). Good separation of cell clusters indicates clear identity assignment for each guide.

Product specifications

- Recover between 2000–320,000 cells for high-throughput assays or 500–80,000 cells for standard assays, per run
- Cell size flexibility, no lower limits
- Cell capture rates of up to 65%
- Low doublet rates of 0.4% per 1,000 cells for high-throughput assays or 0.8% per 1,000 cells for standard assays

5' CRISPR Product	Product code
5' CRISPR Kit, 16 rxns	1000451

5' Gene Expression and/or Immune Repertoire Profiling Products - Standard Throughput	Product code
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Chromium Next GEM Single Cell 5' Kit v2, 4 rxns	1000265
Chromium Next GEM Single Cell 5' Kit v2, 16 rxns	1000263
Chromium Next GEM Chip K Single Cell Kit, 16 rxns	1000287
Chromium Next GEM Chip K Single Cell Kit, 48 rxns	1000286
Library Construction Kit, 16 rxns	1000190
Dual Index Kit TT Set A, 96 rxns	1000215

5' Gene Expression Profiling Products - High Throughput	Product code
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Chromium Next GEM Single Cell 5' HT Kit v2, 8 rxns (includes 1 chip)	1000374
Chromium Next GEM Single Cell 5' HT Kit v2, 48 rxns (includes 5 chips)	1000356
Library Construction Kit, 48 rxns	1000352
Dual Index Kit TT Set A, 96 rxns	1000215
Chromium Next GEM Chip N Single Cell Kit, 16 rxns (includes 1 chip)	1000375

* One HT reaction requires two Feature Barcode reactions.

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Immune Repertoire Profiling Products	Product code
Chromium Single Cell Human TCR Amplification Kit, 16 rxns	1000252

Chromium Single Cell Human BCR Amplification Kit, 16 rxns	1000253
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Chromium Single Cell Mouse TCR Amplification Kit, 16 rxns	1000254
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Chromium Single Cell Mouse BCR Amplification Kit, 16 rxns	1000255
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5' Feature Barcode Products (for Cell Surface Protein profiling)	Product code
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5' Feature Barcode Kit, 16 rxns*	1000256
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Dual Index Kit TN Set A, 96 rxns	1000250
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Instrument Compatibility	Product code
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Chromium iX & Accessory Kit, 12 Mo. Warranty	1000328
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Chromium iX & Accessory Kit, 24 Mo. Warranty	1000329
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Chromium X & Accessory Kit, 12 Mo. Warranty	1000331
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Chromium X & Accessory Kit, 24 Mo. Warranty	1000332
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Chromium X Upgrade Package	1000330
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Chromium Controller & Next GEM Accessory Kit, 12 Mo. Warranty	1000202
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Chromium Controller & Next GEM Accessory Kit, 24 Mo. Warranty	1000204
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Software	Product code
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Cell Ranger 10xgen.com/scRNA-5-cell-ranger 10xgenomics.com/cloud	Download Run with Cloud Analysis
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Loupe Browser 10xgen.com/scRNA-5-loupe-cell	Download
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Loupe V(D)J Browser 10xgen.com/loupe-vdj	Download
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Compatible Partner Products	
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Compatible Partner Product: Biolegend TotalSeq™-C www.biolegend.com/totalseq	Learn More
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Compatible Partner Product: SigmaAldrich®** 10x Genomics Custom CRISPR Lentiviral Products www.SigmaAldrich.com/10xCRISPRpools	Learn More
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