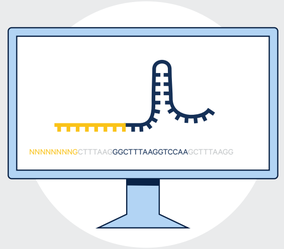
Bringing scale and single cell resolution to functional CRISPR screens

CRISPR screening is a powerful method to investigate how the quantitative expression of certain genes affects complex cellular phenotypes and processes. With Chromium Single Cell CRISPR Screening from 10x Genomics, researchers can profile thousands of different CRISPR perturbations and detect single-guide RNAs (sgRNAs) with directly linked gene expression phenotypes at single cell resolution. This comprehensive approach empowers researchers to explore the complete transcriptomic effects of genetic perturbations with greater throughput, experimental efficiency, and resolution than bulk CRISPR screening or individual knockouts.

01

Design your CRISPR library

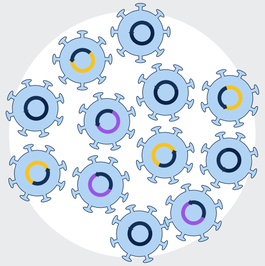
- Select your target genes
- Use 2–5 sgRNAs/gene
- Recover 100–250 cells/guide
- Design your guides with an online tool or select from a **validated database**



02

Assemble lentivirus

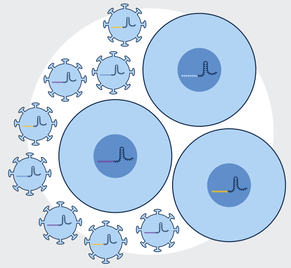
- Load vectors into virus or transfect directly into cells
- Find lentiviral production protocols **here**
- Alternatively, leverage existing CRISPR-Cas9 libraries for subsequent workflow steps



03

Infect and select your cells

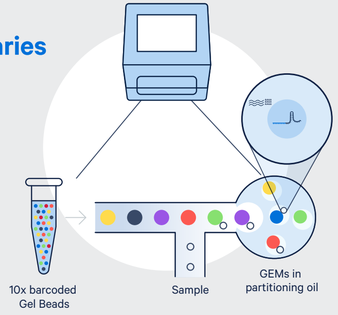
- Infect cells with your lentiviral library to deliver sgRNAs
- Select for cells expressing guides with FACS and/or antibiotic resistance
- Stimulate cells to engage a process or pathway of interest
- Learn more in this **transduction protocol**



04

Construct your 10x Genomics libraries

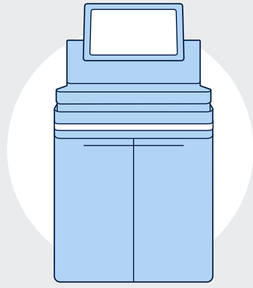
- Load your suspension of transduced single cells onto the Chromium X/iX or Controller
- Captured sgRNAs, mRNA transcripts, cell surface proteins, and/or immune receptor sequences will share a cell barcode, linking the guides with the perturbed cell phenotypes



05

Sequence libraries

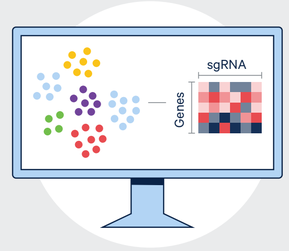
- The Chromium single cell workflows will produce gene expression, CRISPR guide RNA, and/or cell surface protein libraries
- Sequence libraries on a compatible short-read sequencer



06

Discover new insights

- Analyze your single cell data with easy-to-use 10x Genomics software tools, Cell Ranger and Loupe Browser
- Evaluate gene function across different cellular processes, assess genetic contributions to disease, or validate new drug targets



Find the speed, resolution, and scale you need for your functional CRISPR screens. Learn more at 10xgenomics.com/products/single-cell-crispr-screening

LIT000096 Rev C 10x Genomics CRISPR workflow