



Single-Nucleus ATAC Sequencing

Product Overview

The **10x Single Nucleus ATAC** (Assay for Transposase Accessible Chromatin) assay allows the identification of regions of open chromatin, providing a snapshot of where DNA is accessible for transcription factors and other regulatory proteins to bind DNA and influence gene expression. Single nuclei ATAC-seq brings this information to a single cell scale, revealing for instance the heterogeneity within a population of cells. 10x v2 kit allows the detection of several thousand transcripts per nuclei. This assay can be used with nuclei hashing for sample multiplexing to reduce technical variability (only for nuclei).

After a transposition step where a transposase fragments the DNA in regions of open chromatin, the 10x kit is based on the generation of nanoliter-scale droplets in which a single nucleus will bind to a gel bead coated with oligos containing a unique barcode and a capture sequence to bind transposed DNA fragments. An amplification step will generate barcoded single-stranded DNA products, followed by library preparation.

Sequencing will be performed on the NovaSeq X Plus platform (Illumina) with tailored sequencing settings based on the project design and the user's needs.

What is Included

- Cell sorting using FACS (optional)
- GEM generation and Single cell library preparation
- Quality control of library
- Library pooling and sequencing on Illumina NovaSeq X Plus.
- FASTQ files
- Standard data processing (CellRanger ARC)
- Demultiplexing of HTO (ASAP-seq), if applicable.

Input and quality requirements

Isolation of cells or nuclei

Isolation of nuclei is the responsibility of the user. Contact [SCOP](#) to consult.

Quality

The quality of the nuclei will reflect the downstream process – poor quality leads to poor data.

- Intact nuclei
- No to minimal debris and nuclei aggregates
- Optional quality measures: DV200 > 30% for nuclei.

SCOP strongly recommends performing a pilot experiment to assess both sample and data quality.

Cell Hashing

Cell hashing (if applied) is the responsibility of the user, and samples should be incubated with cell hashing antibodies (Hashtags, provided by SCOP) prior to sample drop-off. Contact [SCOP](#) to consult on nucleus hashing and receive protocols.

Sample drop-off

Single nuclei should be delivered at a specific concentration which depends on the assay type and the desired number of nuclei. Contact SCOP for more information.

Data Deliverables

SCOP's preprocessing workflow includes

- FASTQ files
- ATAC data output (CellRanger ARC)
- Preprocessed data stored in Seurat objects
- Figures visualizing the data.