TECHNICAL NOTE

Chromium Next GEM Single Cell ATAC v1.1: Reagent & Workflow Updates

Introduction

The Chromium Single Cell ATAC Solution provides a comprehensive, scalable approach to determine the regulatory landscape of chromatin in hundreds to thousands of cells in a single sample. This document highlights the key changes in Chromium Next GEM Single Cell ATAC v1.1 reagents along with workflow updates for generating and analyzing Illumina-ready sequencing libraries.

Refer to the Chromium Next GEM Single Cell ATAC Reagent Kits v1.1 User Guide for the complete protocol.

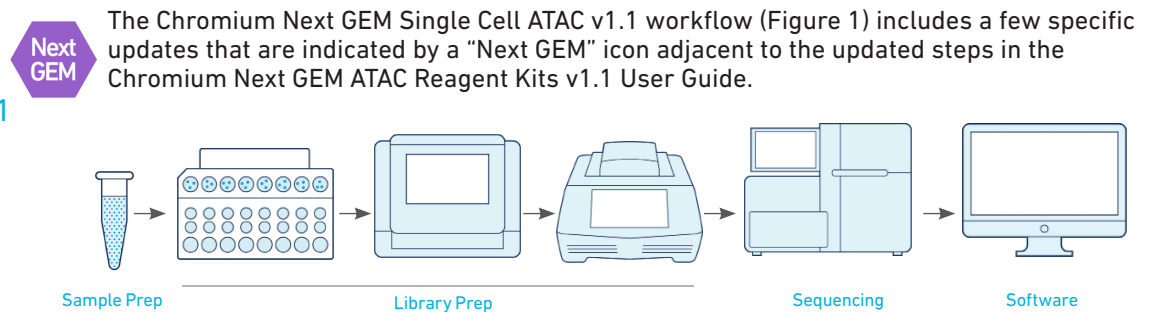## Chromium Next GEM Single Cell ATAC v1.1 Workflow

The Chromium Next GEM Single Cell ATAC v1.1 workflow (Figure 1) includes a few specific updates that are indicated by a "Next GEM" icon adjacent to the updated steps in the Chromium Next GEM ATAC Reagent Kits v1.1 User Guide.

Sample Prep   Library Prep   Sequencing   Software

Figure 1. Chromium Next GEM Single Cell ATAC v1.1 workflow.

Chromium Next GEM Chip H

The Chromium Next GEM Chip H is assembled in the Chromium Next GEM Secondary Holder. The location of the rows labeled 1-3 and the NO FILL (not used) wells are unique to the Chromium Next GEM Chip H (Figure 2A). GEMs are generated by combining a Master Mix containing transposed nuclei and enzymes, barcoded Single Cell ATAC Gel Beads v1.1, and Partitioning Oil onto the Chromium Next GEM Chip H (Figure 2B).
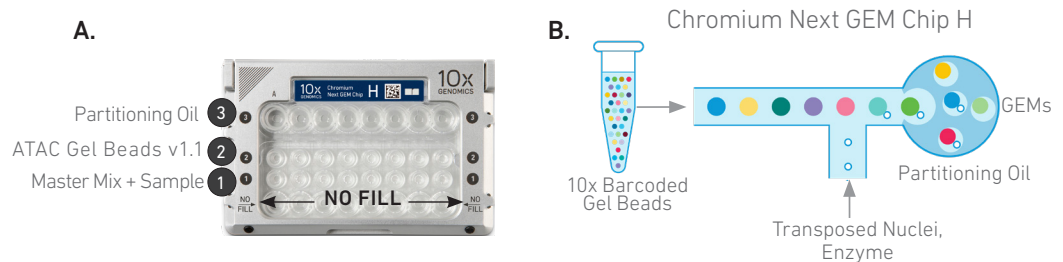

A.

Partitioning Oil — 3
ATAC Gel Beads v1.1 — 2
Master Mix + Sample — 1
NO FILL

B.

Chromium Next GEM Chip H

10x Barcoded Gel Beads

Transposed Nuclei, Enzyme

Partitioning Oil

GEMs

Figure 2. Chromium Next GEM Chip H assembled in a Chromium Next GEM Secondary Holder (A). GEM generation in Chromium Next GEM Chip H (B).
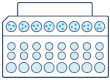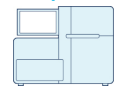
Sample Prep

20X Nuclei Buffer (name and PN change only) for nuclei isolation included in the Chromium Next GEM ATAC Library Kit v1.1.

Library Prep

Protocol Steps	Single Cell ATAC	Next GEM Single Cell ATAC v1.1
Reagent Kits		
10x Genomics Reagents	Chromium Single Cell ATAC Reagent Kits	Chromium Next GEM Single Cell ATAC Reagent Kits v1.1
	Chromium i7 Multiplex Kit N, Set A	Single Index Kit N, Set A
Transposition		
Nuclei Buffer Name	Nuclei Buffer	20X Nuclei Buffer (name change only)
Transposition Mix	ATAC Buffer	ATAC Buffer B
GEM Generation & Barcoding		
Reagents in Master Mix	Barcoding Reagent	Barcoding Reagent B (updated reagent volumes in Master Mix; 60 µl Master Mix volume added to Transposed Nuclei)
Gel Bead	Single Cell ATAC Gel Beads	Single Cell ATAC Gel Bead v1.1 (updated handling instructions; vortex 30 sec, centrifuge 5 sec before use)
Chip Loading (Chips cannot be used interchangeably)		

	Single Cell ATAC	Next GEM Single Cell ATAC v1.1
Master Mix + Sample / Gel Beads / Partitioning Oil	75 µl – row labeled 1 / 40 µl – row labeled 2 / 240 µl – row labeled 3	● 70 µl – row labeled 1 / ● 50 µl – row labeled 2* / ● 40 µl – row labeled 3**

* After loading the Gel Beads, wait 30 sec before loading Partitioning Oil.

After loading Partitioning Oil, attach the gasket and run the chip in the Chromium Controller **immediately

Chromium Controller		
Firmware Version	3.16 or higher	4.0 or higher
Run Time	~8.5 min	~18 min
GEM Recovery		

	Single Cell ATAC	Next GEM Single Cell ATAC v1.1
	From top row labeled "NO FILL"	From top row labeled "3"
Library Construction		
SI-PCR Cycles	–	Updated cycle numbers

Sequencing

Recommendations for sequencing libraries generated using the Chromium Next GEM Single Cell ATAC Reagent Kits v1.1 protocol are same as sequencing recommendations for libraries generated using the Chromium Single Cell ATAC Reagent Kit protocol.

Software

Libraries generated using the Chromium Next GEM Single Cell ATAC Reagent Kits v1.1 can be analyzed and visualized using the current versions of Cell Ranger ATAC and Loupe Cell Browser.

Chromium Next GEM Single Cell ATAC v1.1 – Product List & Documents

Product list for generating Chromium Single Cell ATAC Libraries:

REAGENT KITS	REACTIONS	PART NUMBER (PN)
Chromium Next GEM Single Cell ATAC Library & Gel Bead Kit v1.1	16 rxns 4 rxns	1000175 1000176
Chromium Next GEM Chip H Single Cell Kit	48 rxns 16 rxns	1000161 1000162
Single Index Kit N, Set A	96 rxns	1000212
INSTRUMENT		
Chromium Controller & Next GEM Accessory Kit	–	120223 (12 month warranty) 120246 (24 month warranty)
SOFTWARE		
Cell Ranger ATAC (DOWNLOAD)		
Loupe Cell Browser (DOWNLOAD)		
DOCUMENTS		
User Guide : Chromium Next GEM Single Cell ATAC Reagent Kits v1.1 (CG000209) Demonstrated Protocol : Nuclei Isolation for Single Cell ATAC Sequencing (CG000169) Demonstrated Protocol : Nuclei Isolation from Mouse Brain Tissue for Single Cell ATAC Sequencing (CG000212)		

10x GENOMICS