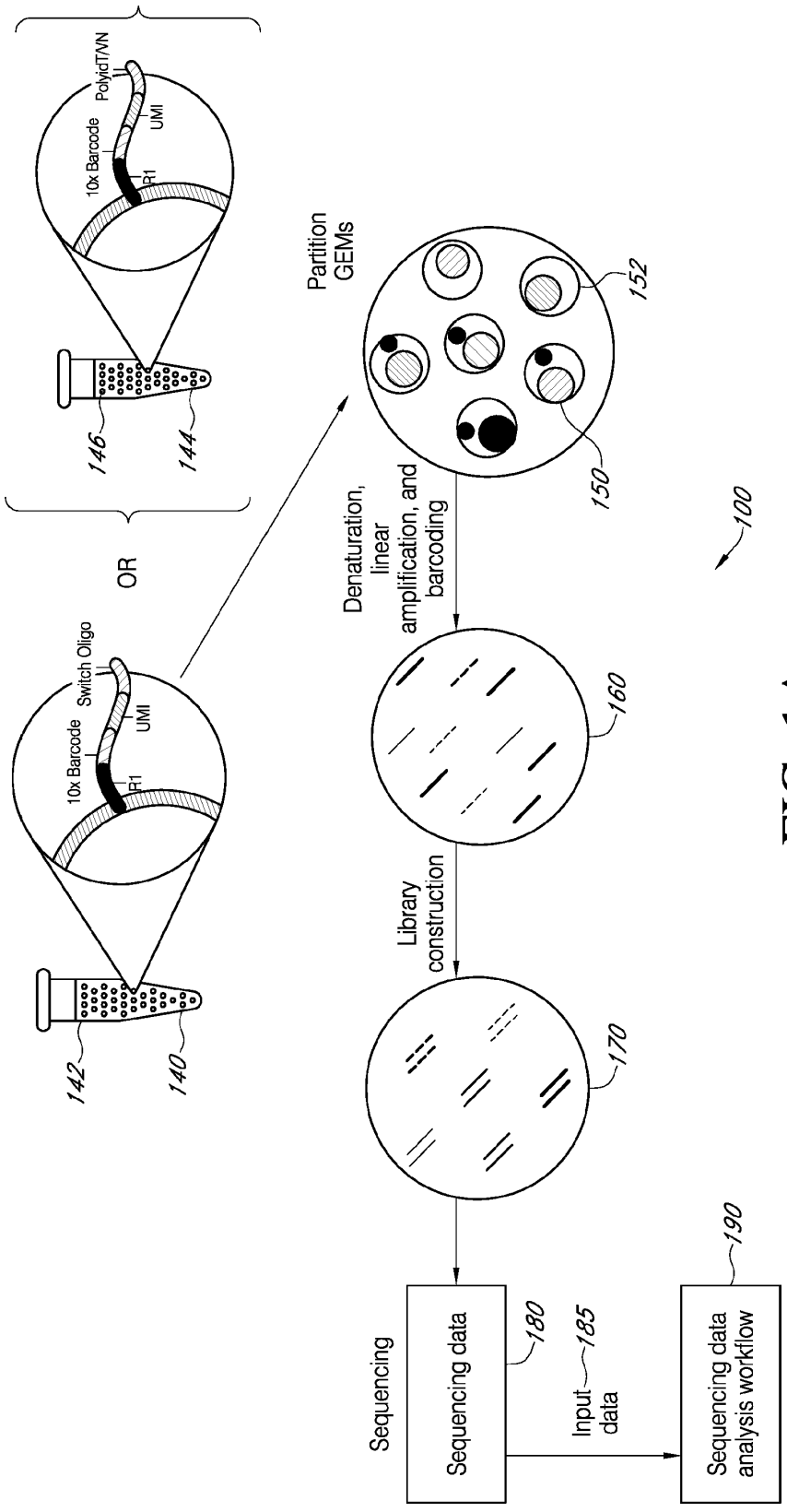
PolydT/VN
10x Barcode
UMI
R1
146
144
OR
Switch Oligo
10x Barcode
UMI
R1
142
140
Partition GEMs
152
150
Denaturation, linear amplification, and barcoding
160
Library construction
170
Sequencing
Sequencing data
180
Input data
185
Sequencing data analysis workflow
190
100

FIG. 1A

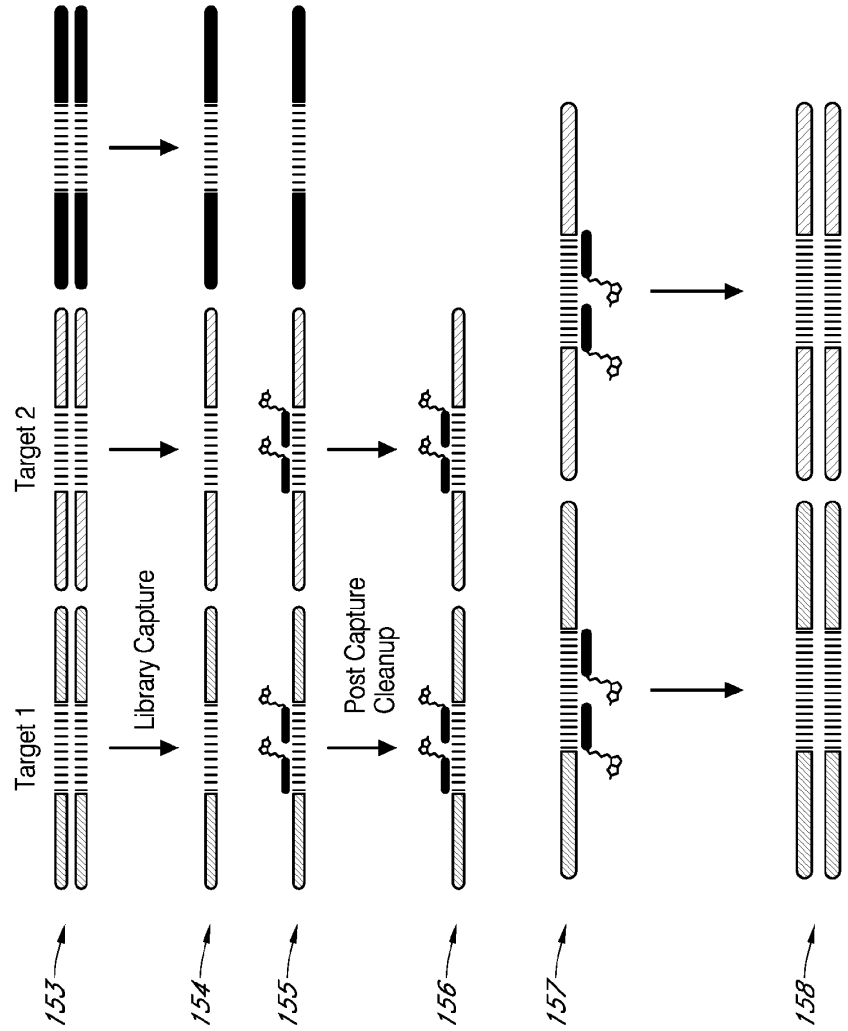
Target 1
Target 2
Library Capture
Post Capture Cleanup
153
154
155
156
157
158

FIG. 1B

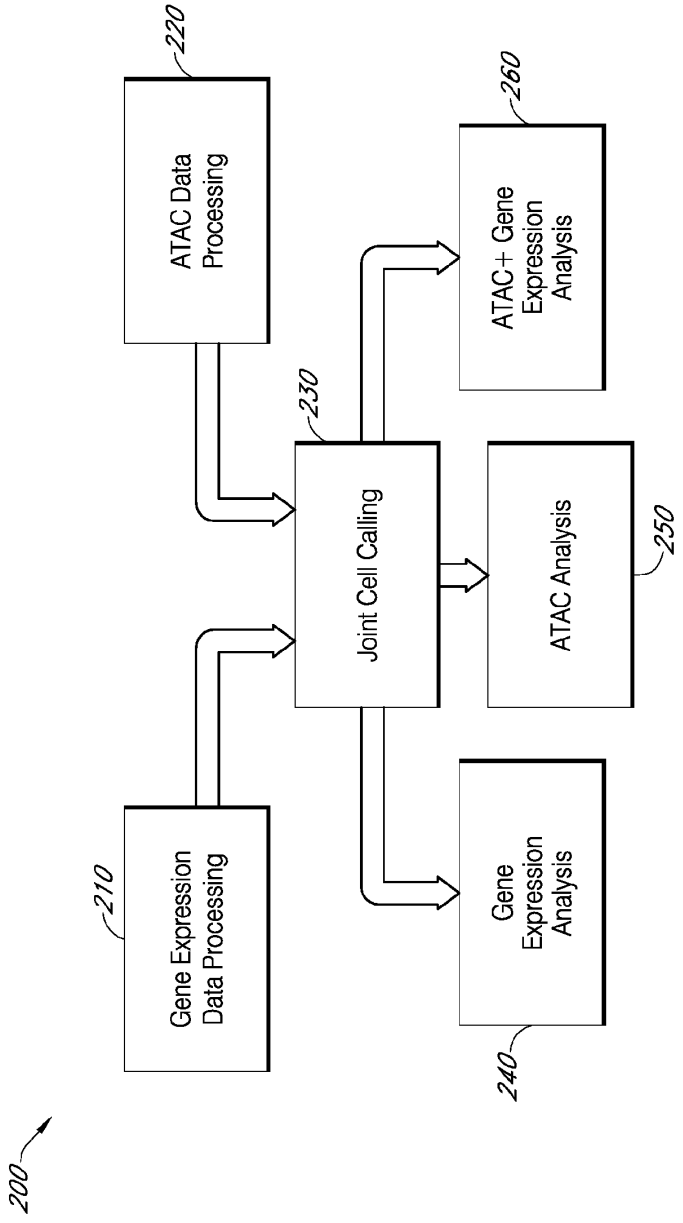
200
210
Gene Expression Data Processing
220
ATAC Data Processing
230
Joint Cell Calling
240
Gene Expression Analysis
250
ATAC Analysis
260
ATAC+ Gene Expression Analysis

FIG. 2

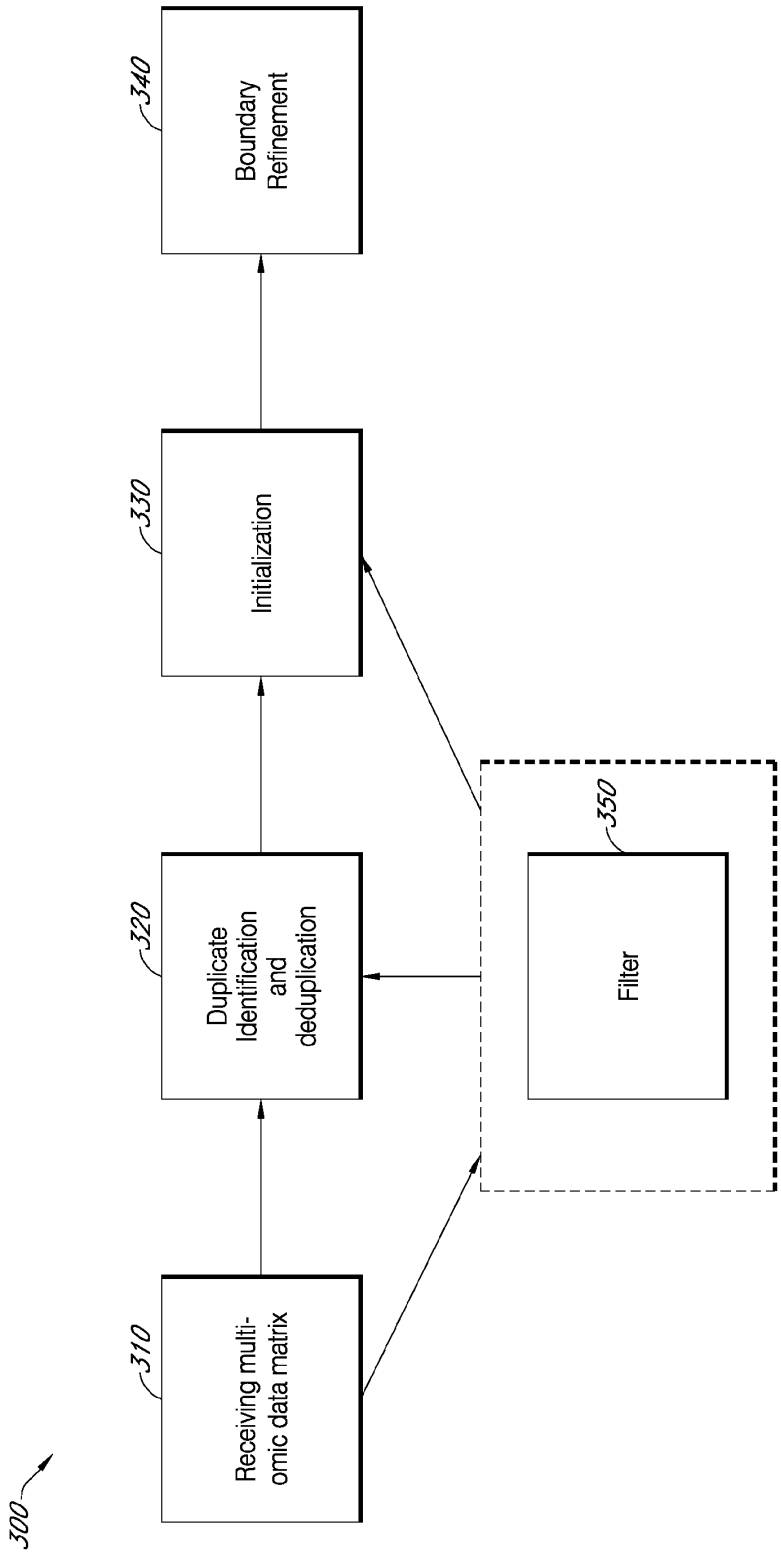
300
310
Receiving multi-omic data matrix
320
Duplicate Identification and deduplication
330
Initialization
340
Boundary Refinement
350
Filter

FIG. 3

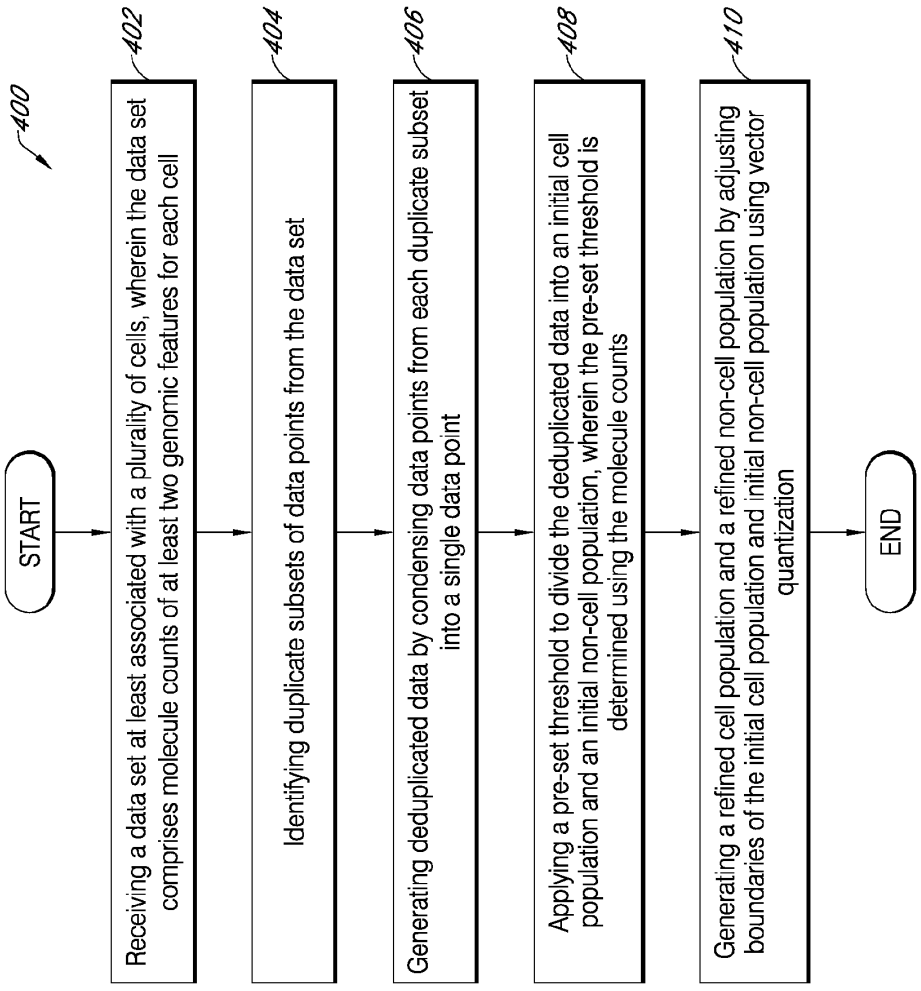
400
START
402
Receiving a data set at least associated with a plurality of cells, wherein the data set comprises molecule counts of at least two genomic features for each cell
404
Identifying duplicate subsets of data points from the data set
406
Generating deduplicated data by condensing data points from each duplicate subset into a single data point
408
Applying a pre-set threshold to divide the deduplicated data into an initial cell population and an initial non-cell population, wherein the pre-set threshold is determined using the molecule counts
410
Generating a refined cell population and a refined non-cell population by adjusting boundaries of the initial cell population and initial non-cell population using vector quantization
END

FIG. 4

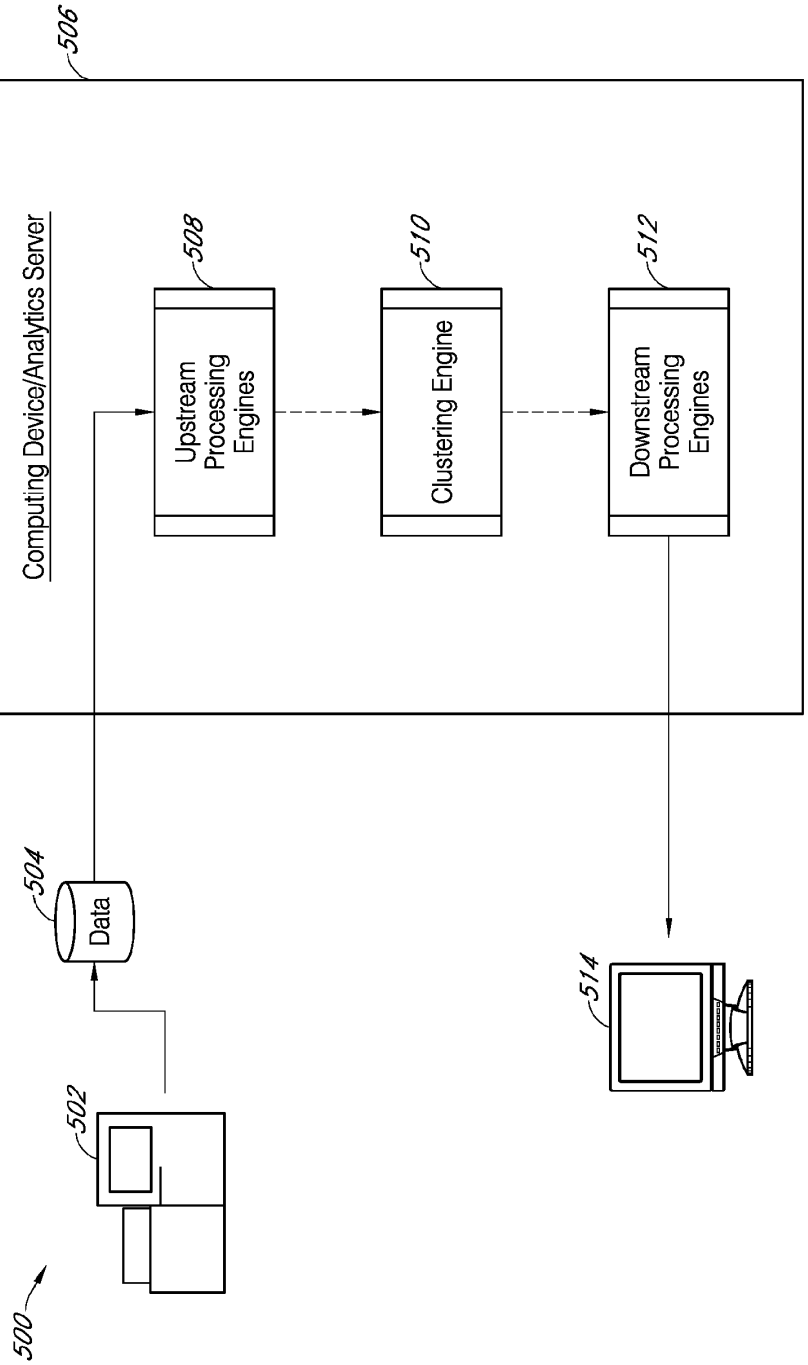
506
Computing Device/Analytics Server
508
Upstream Processing Engines
510
Clustering Engine
512
Downstream Processing Engines
504
Data
502
514
500

FIG. 5

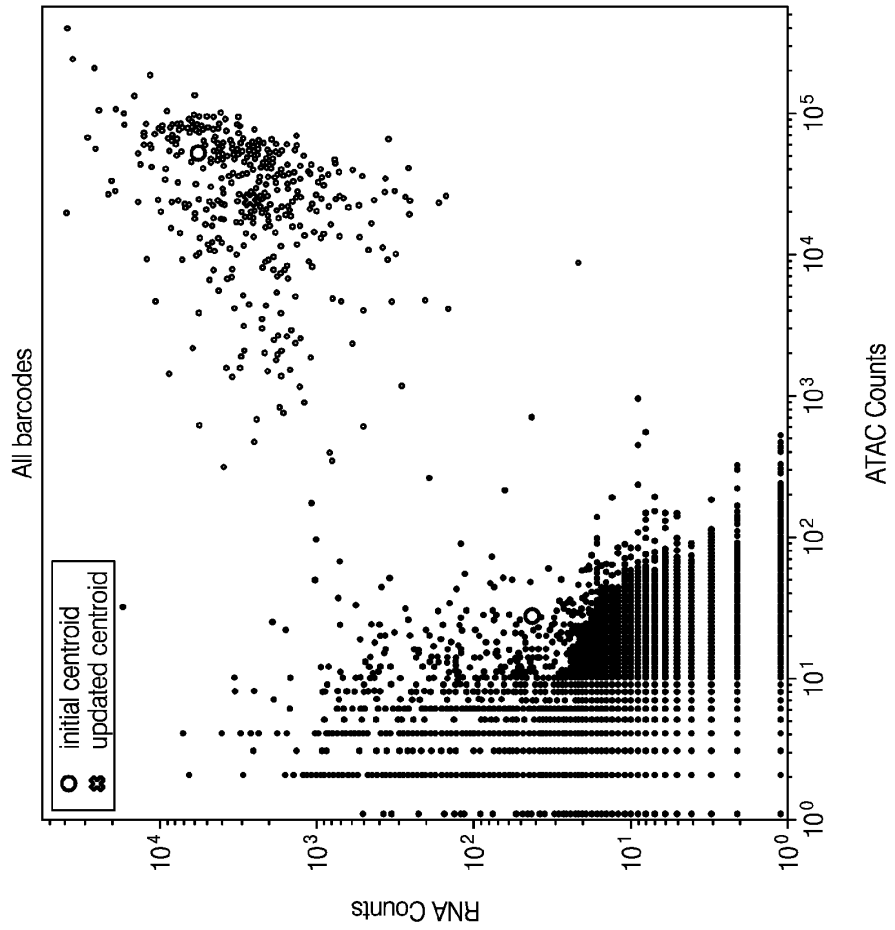
All barcodes
initial centroid
updated centroid
RNA Counts
ATAC Counts
10^0
10^1
10^2
10^3
10^4
10^5

FIG. 6A

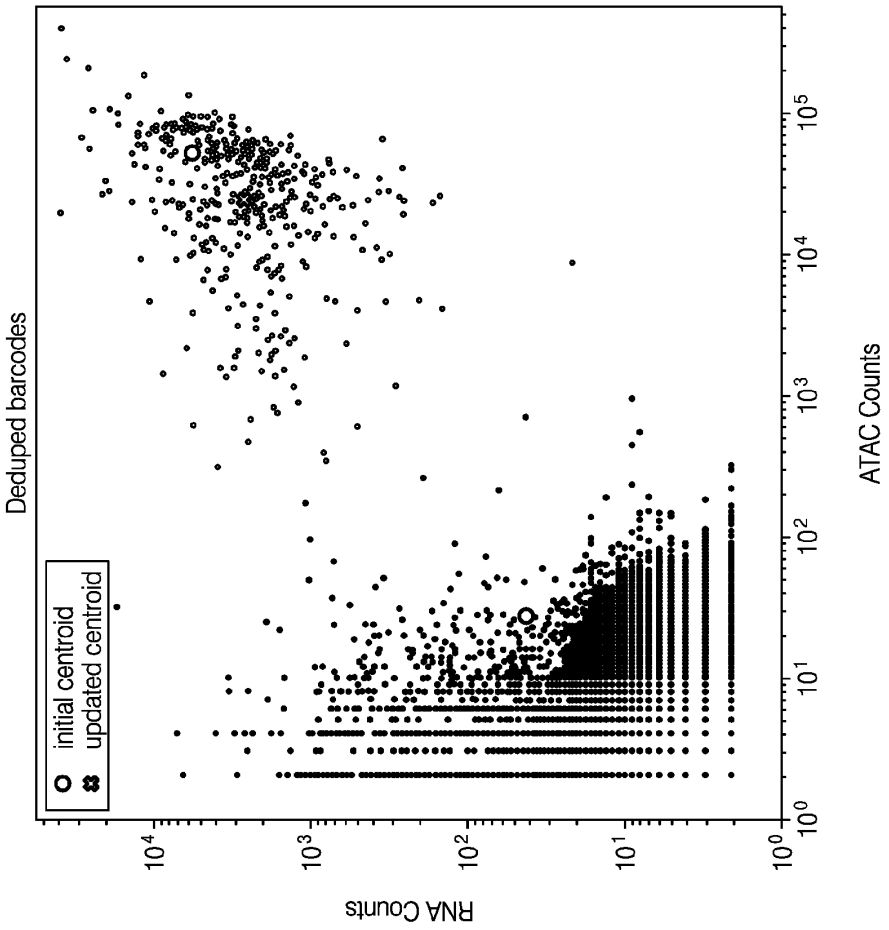
Deduped barcodes
initial centroid
updated centroid
RNA Counts
ATAC Counts
10^0
10^1
10^2
10^3
10^4
10^5

FIG. 6B

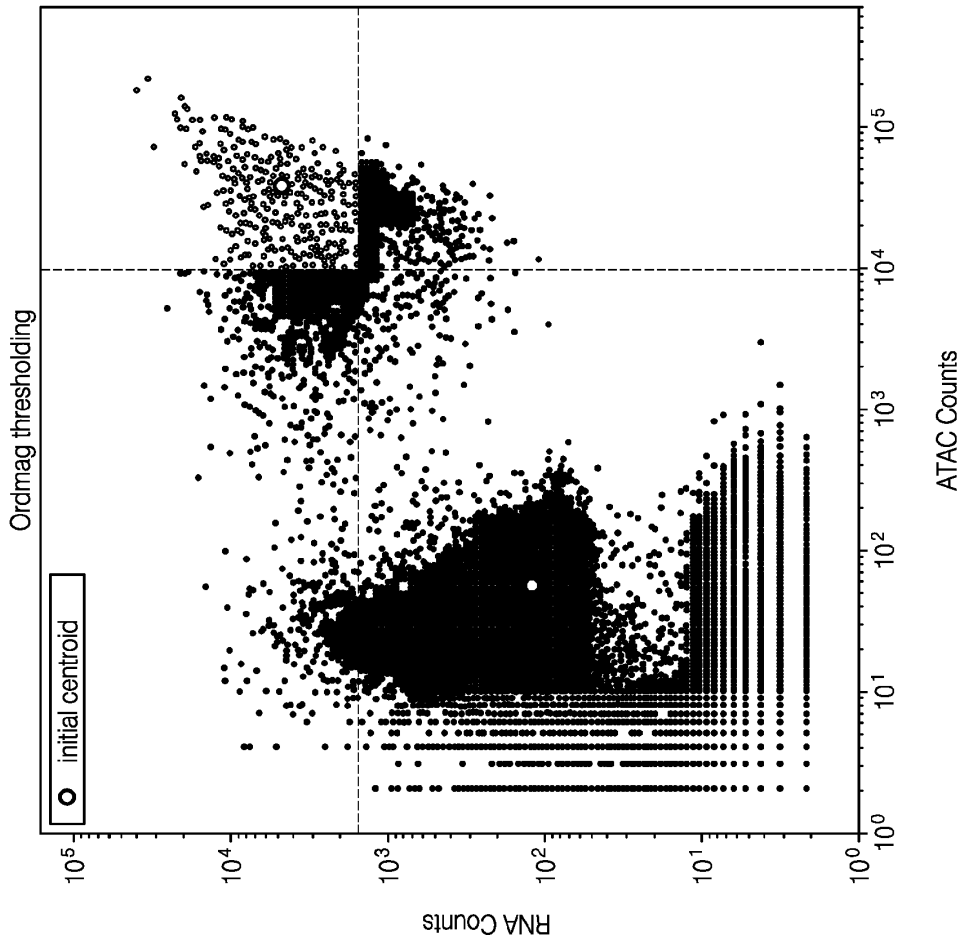
Ordmag thresholding
initial centroid
RNA Counts
ATAC Counts
10^0
10^1
10^2
10^3
10^4
10^5

FIG. 7

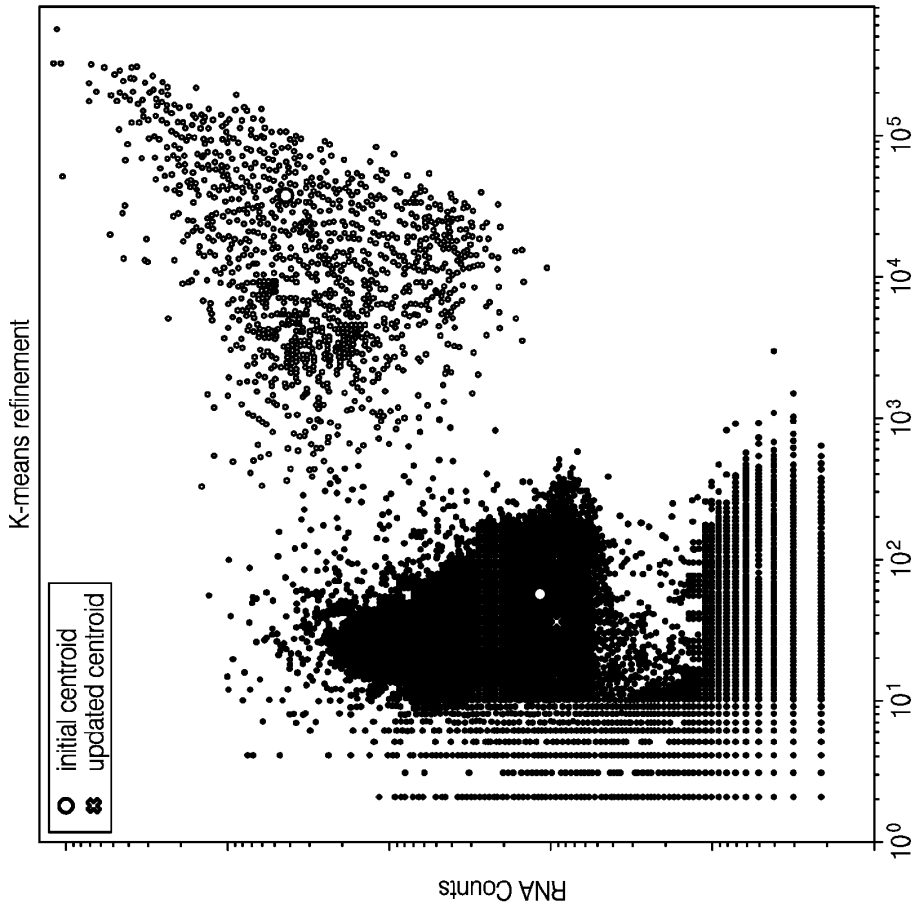
K-means refinement
initial centroid
updated centroid
RNA Counts
ATAC Counts
10^0
10^1
10^2
10^3
10^4
10^5

FIG. 8

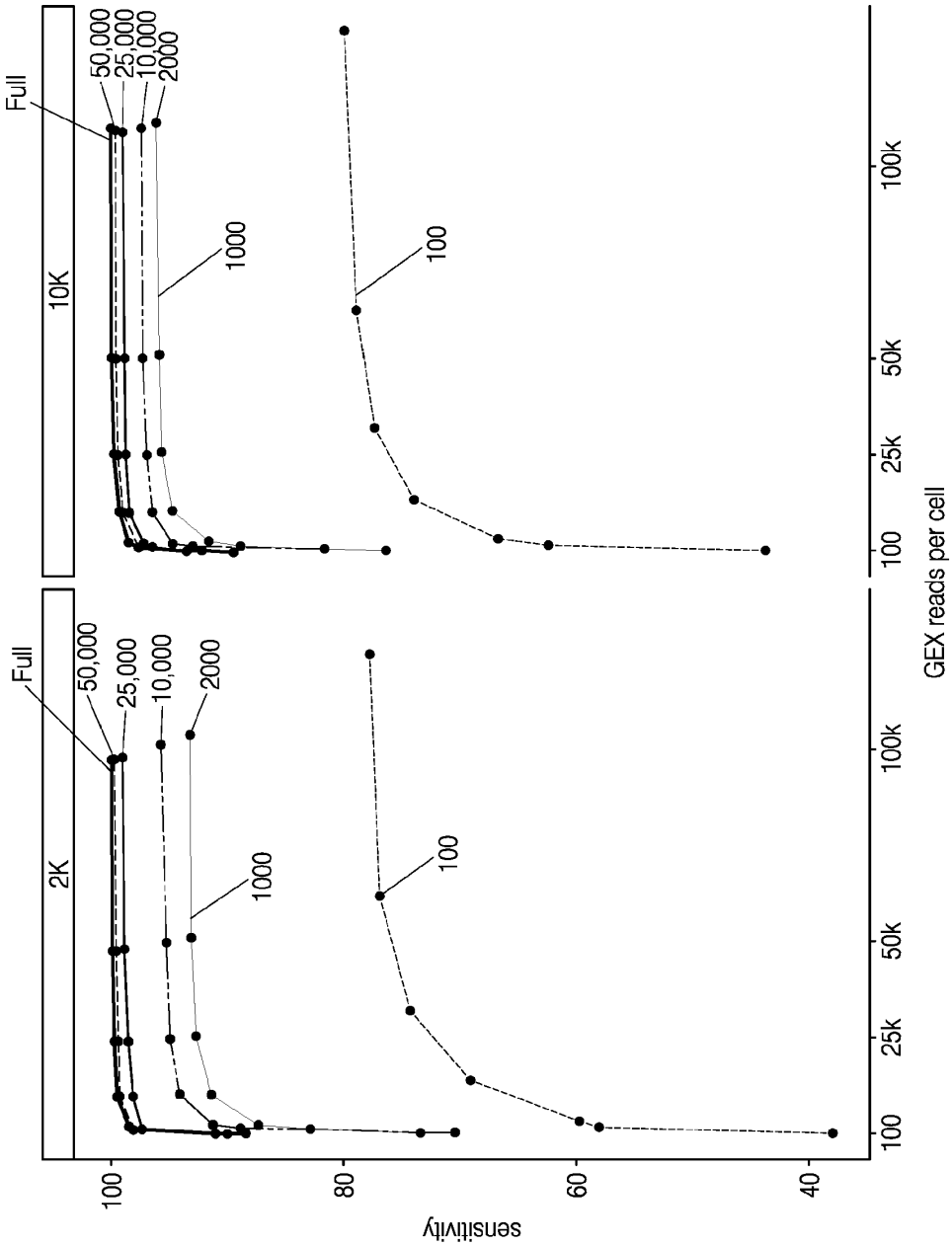
Full
50,000
25,000
10,000
2000
1000
100
2K
10K
sensitivity
100
80
60
40
100
25k
50k
100k
GEX reads per cell

FIG. 9

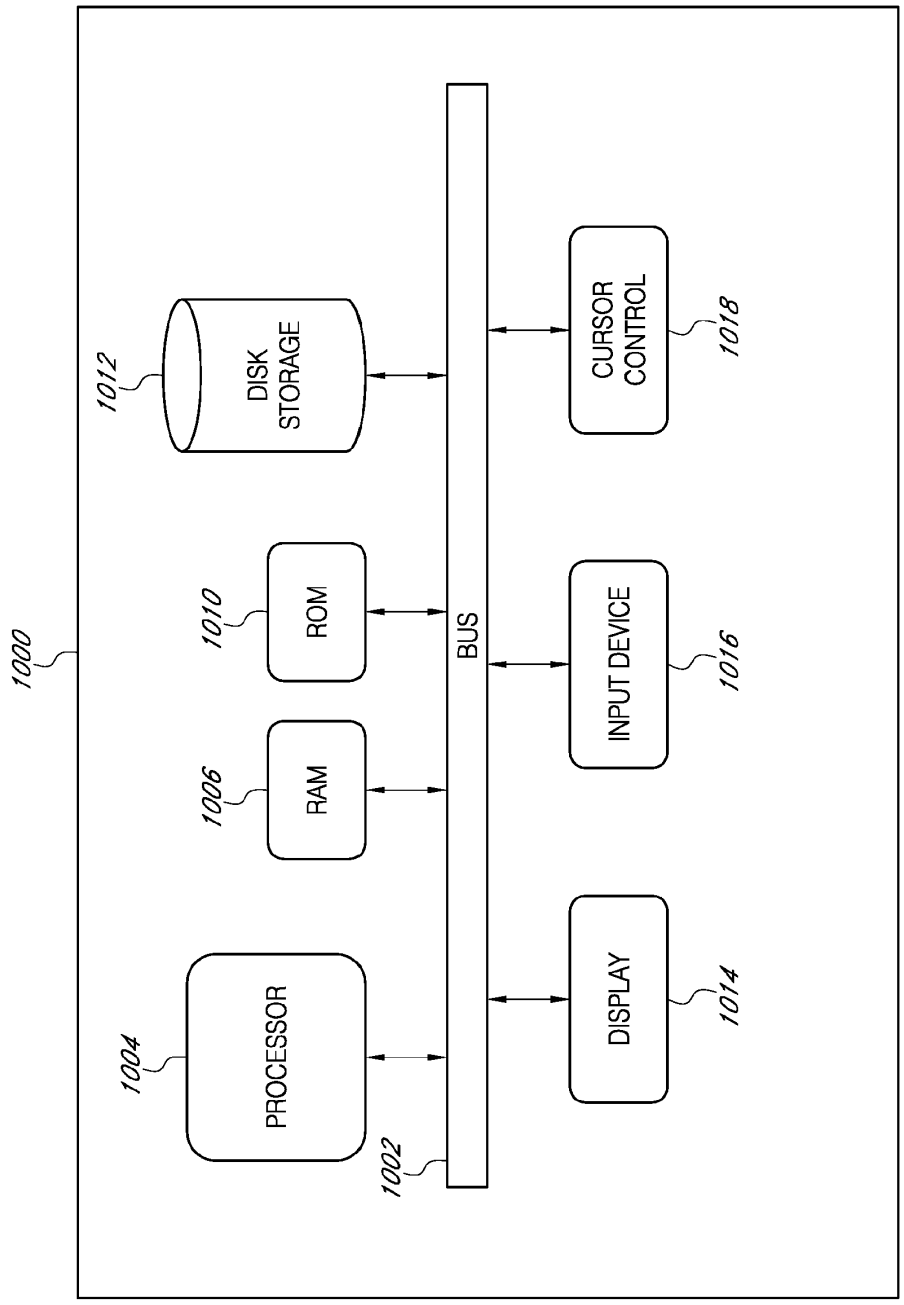
1000
1002
BUS
1004
PROCESSOR
1006
RAM
1010
ROM
1012
DISK STORAGE
DISPLAY
1014
INPUT DEVICE
1016
CURSOR CONTROL
1018

FIG. 10