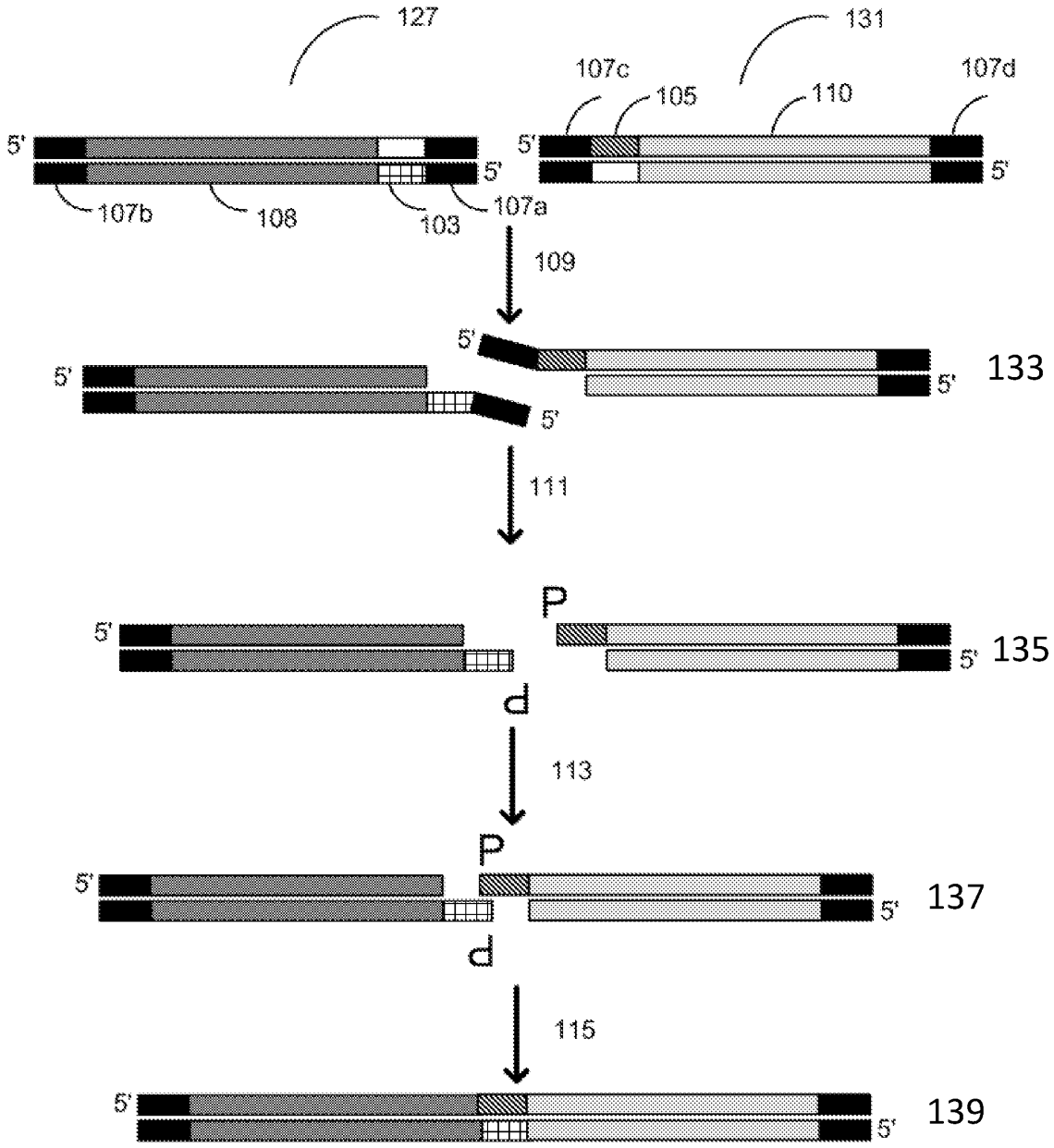

127
131
107c
105
110
107d
5'
5'
5'
5'
107b
108
103
107a
109
5'
5'
5'
5'
133
111
P
5'
5'
135
d
113
P
5'
5'
137
d
115
5'
5'
139

FIG. 1A

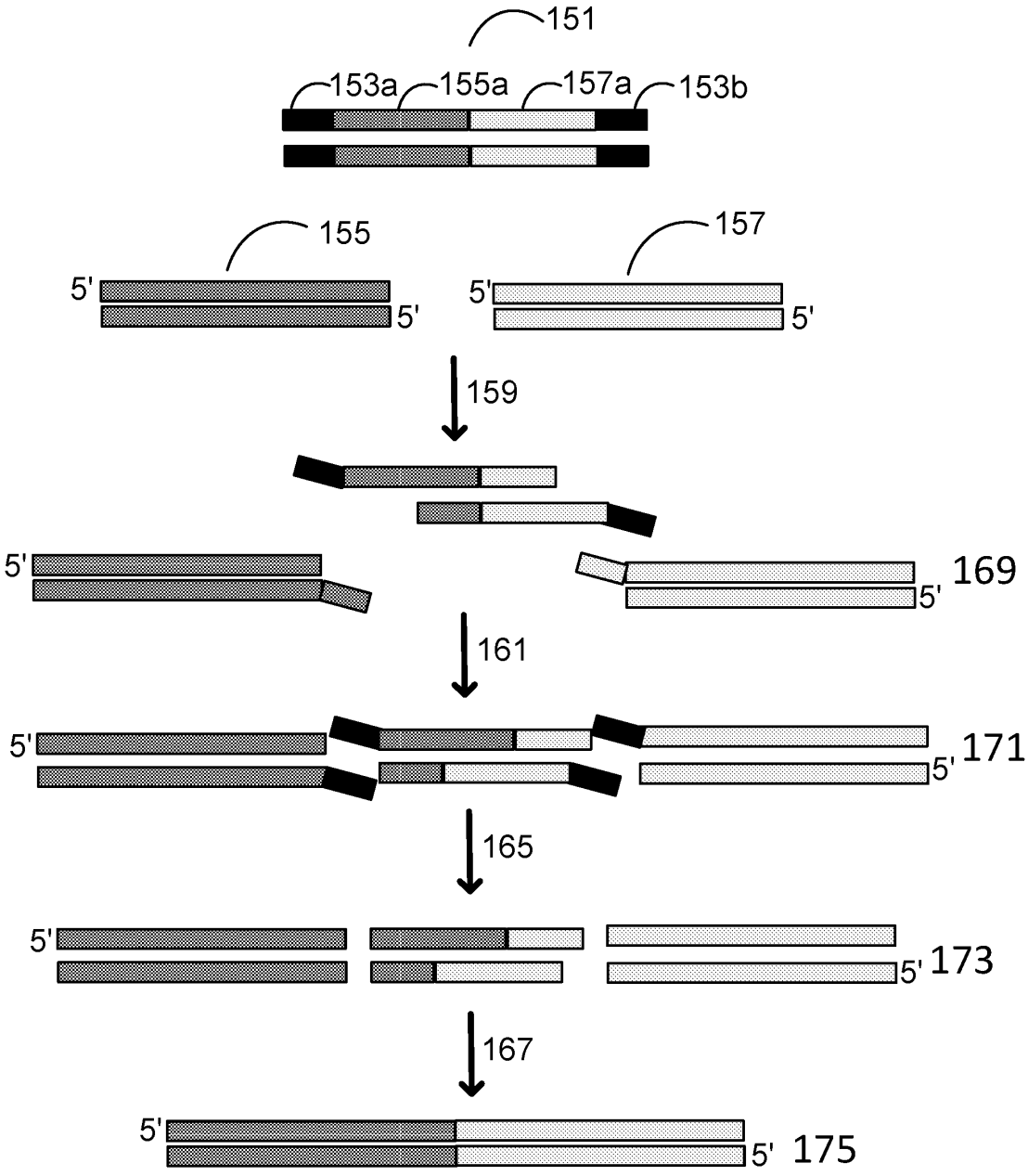

151
153a
155a
157a
153b
155
157
5'
5'
5'
5'
159
5'
5'
169
161
5'
5'
171
165
5'
5'
173
167
5'
5'
175

FIG. 1B

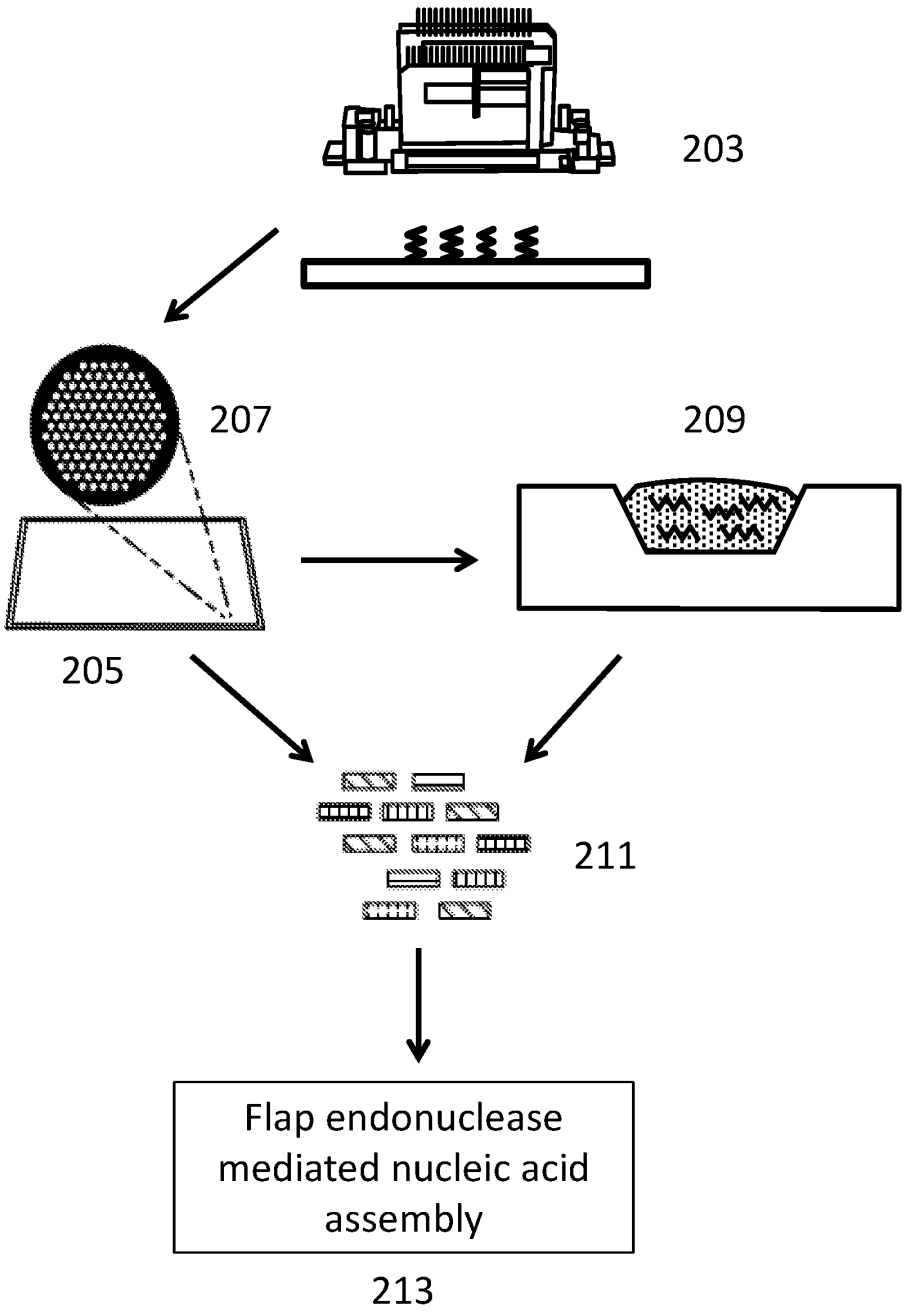

203
207
209
205
211
Flap endonuclease mediated nucleic acid assembly
213

FIG. 2

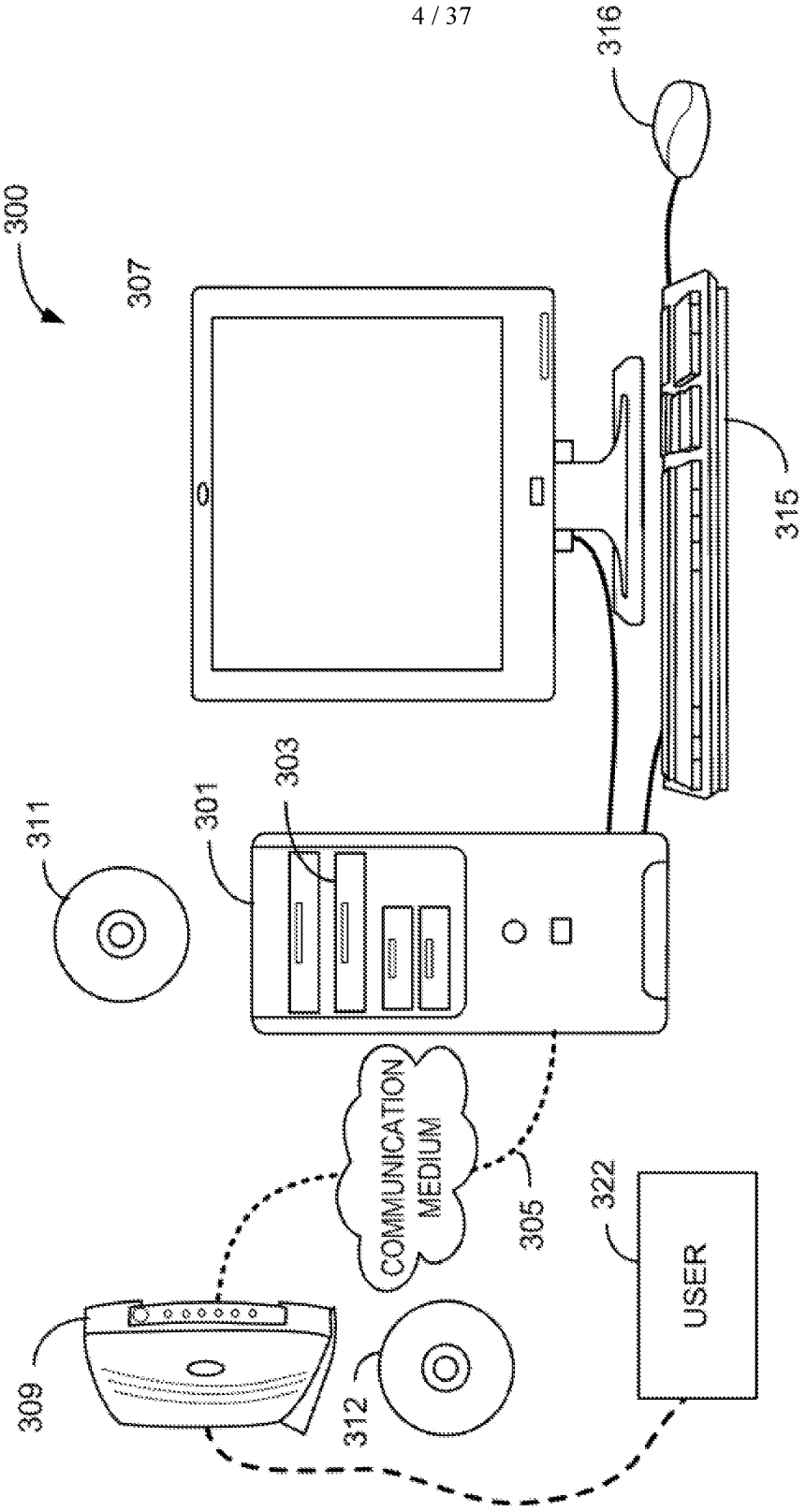

300
307
316
315
303
301
311
COMMUNICATION MEDIUM
305
322
USER
309
312

FIG. 3

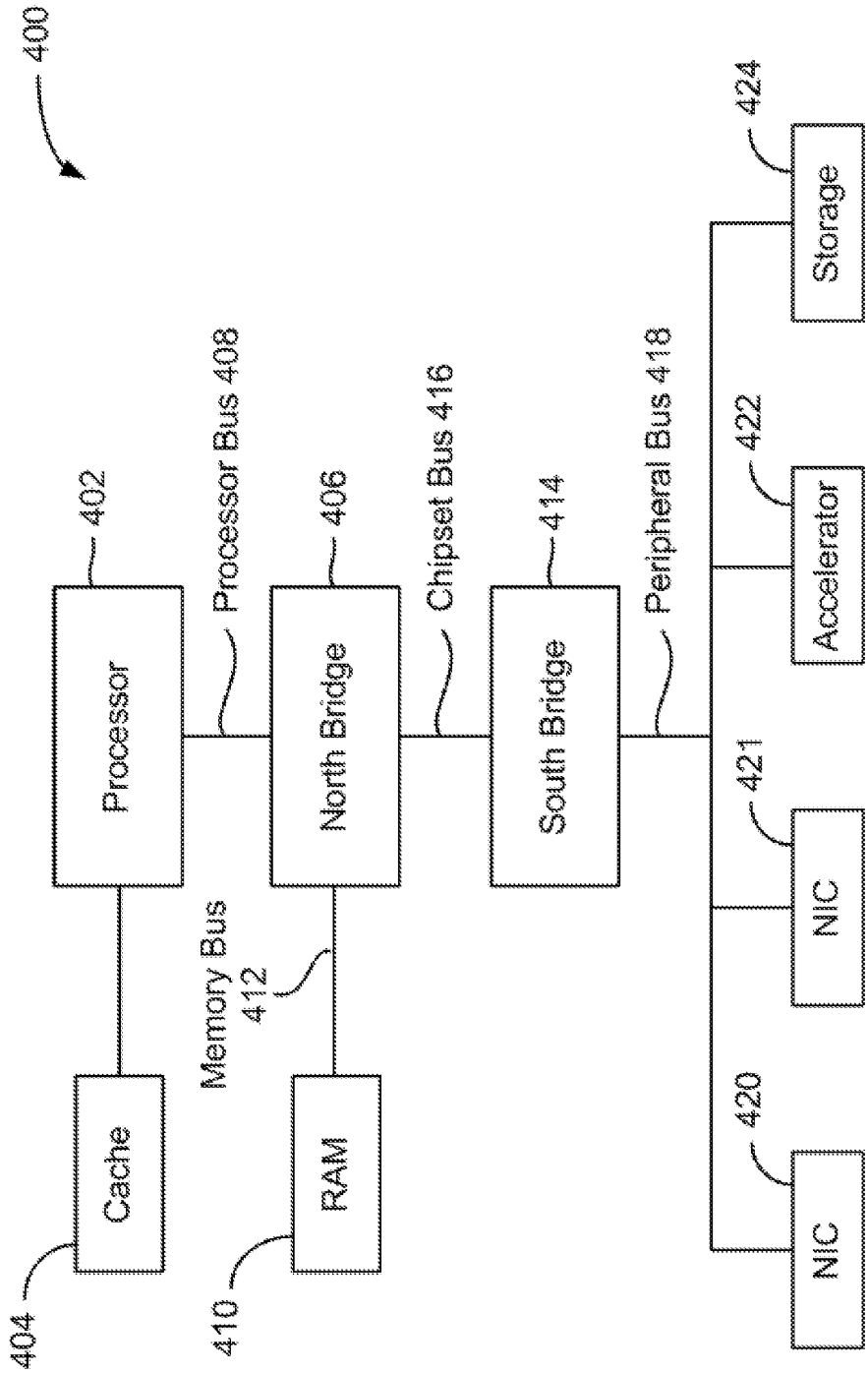

400
Processor
402
Processor Bus 408
North Bridge
406
Chipset Bus 416
South Bridge
414
Peripheral Bus 418
Storage
424
Accelerator
422
NIC
421
NIC
420
Cache
404
Memory Bus
412
RAM
410

FIG. 4

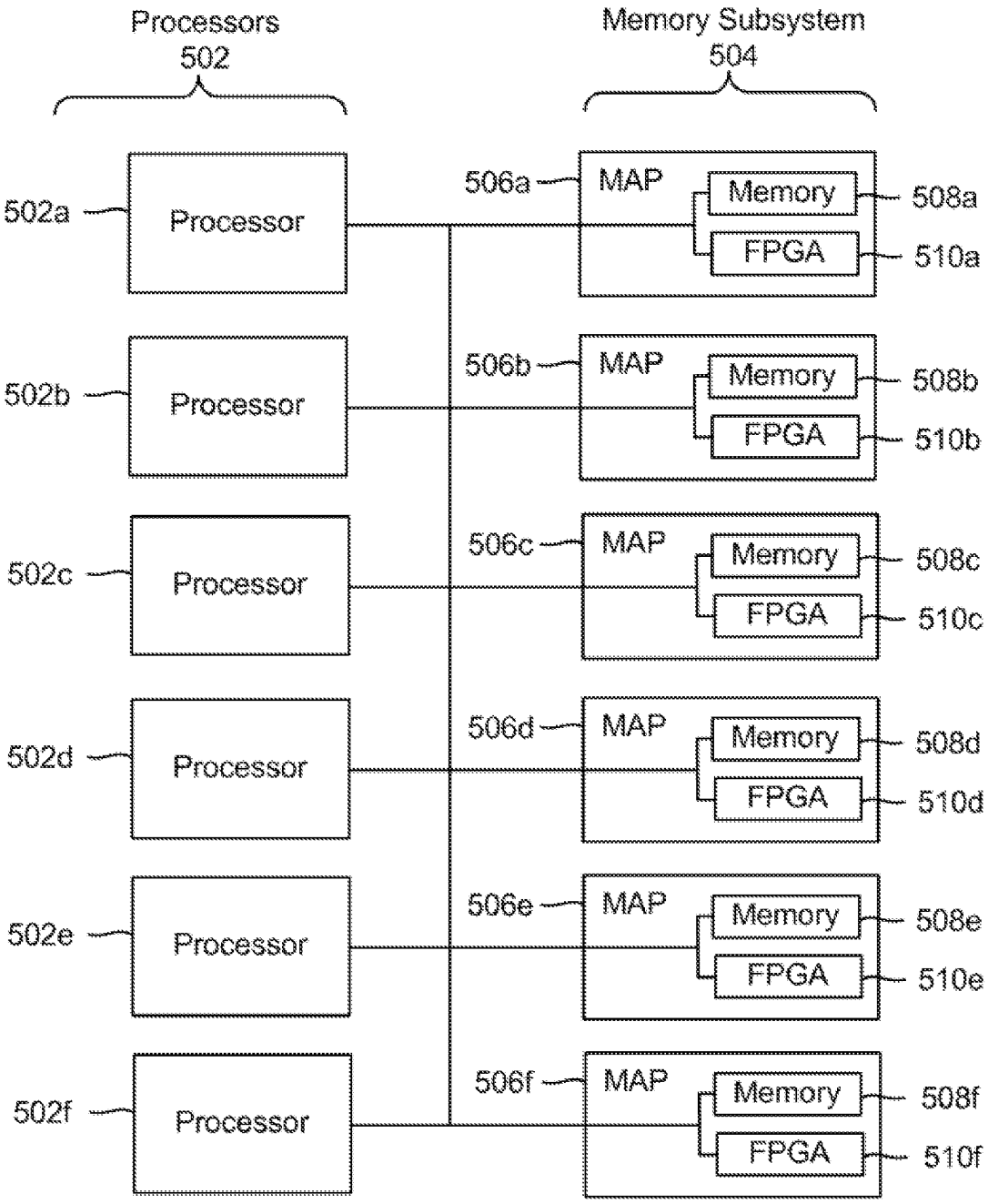

Processors
502
Memory Subsystem
504
502a
Processor
506a
MAP
Memory
508a
FPGA
510a
502b
Processor
506b
MAP
Memory
508b
FPGA
510b
502c
Processor
506c
MAP
Memory
508c
FPGA
510c
502d
Processor
506d
MAP
Memory
508d
FPGA
510d
502e
Processor
506e
MAP
Memory
508e
FPGA
510e
502f
Processor
506f
MAP
Memory
508f
FPGA
510f

FIG. 5

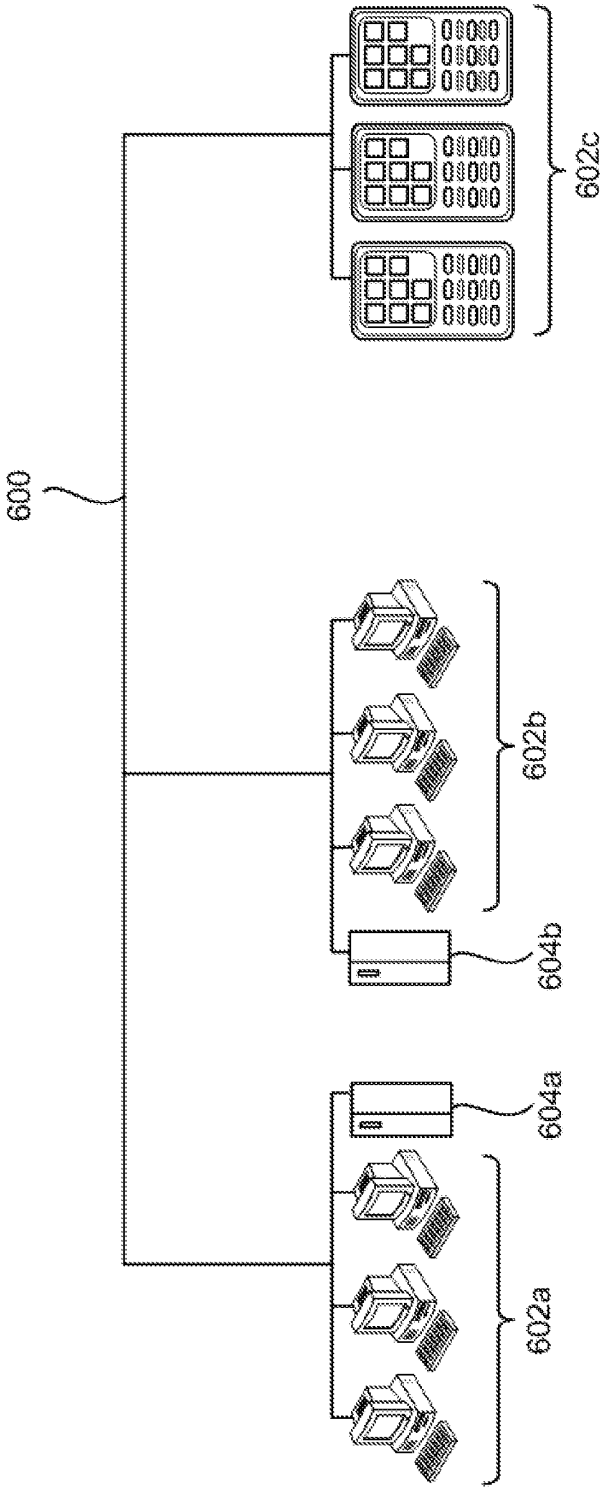


FIG. 6

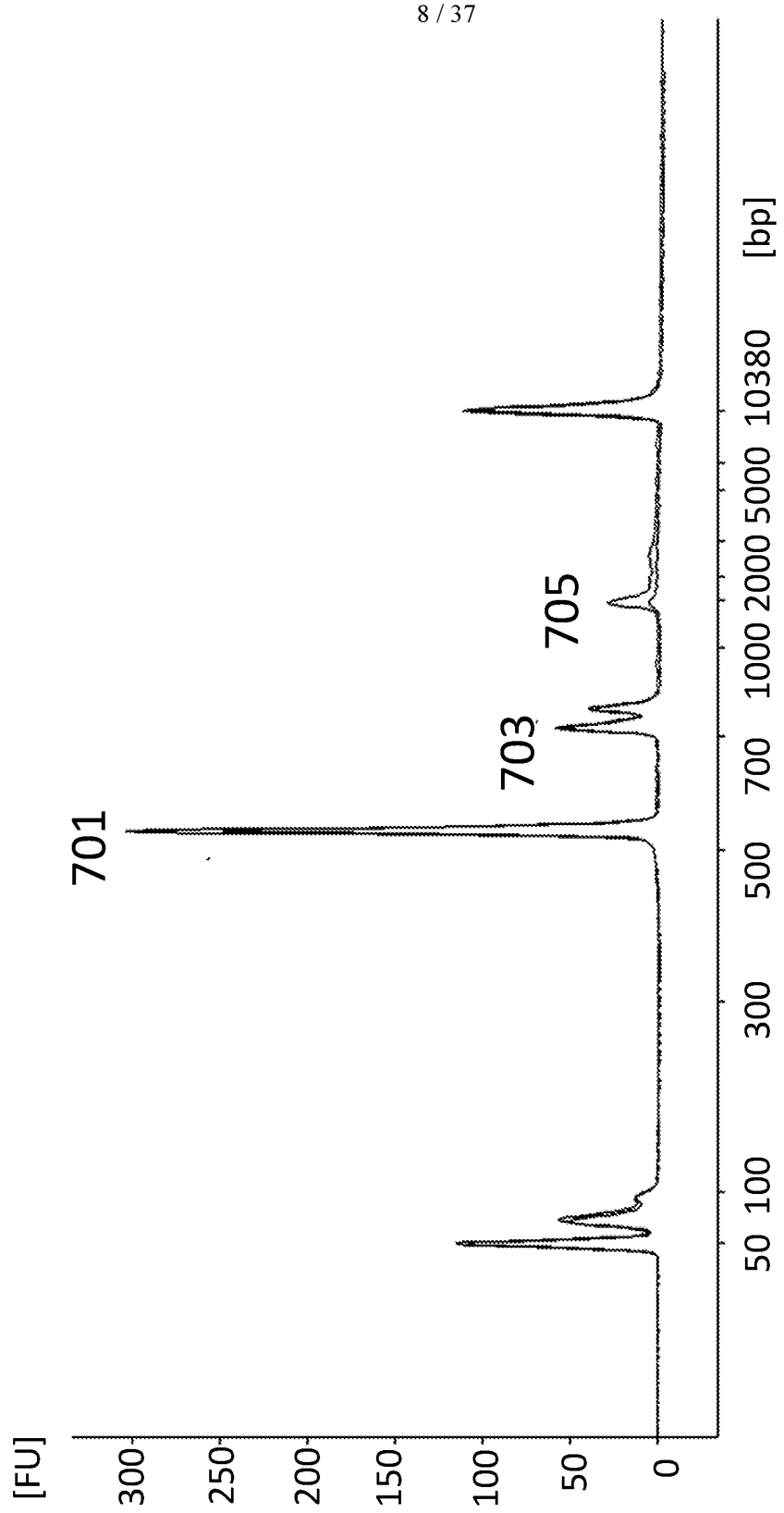

[FU]
300
250
200
150
100
50
0
50 100 300 500 700 1000 2000 5000 10380 [bp]
701
703
705

FIG. 7

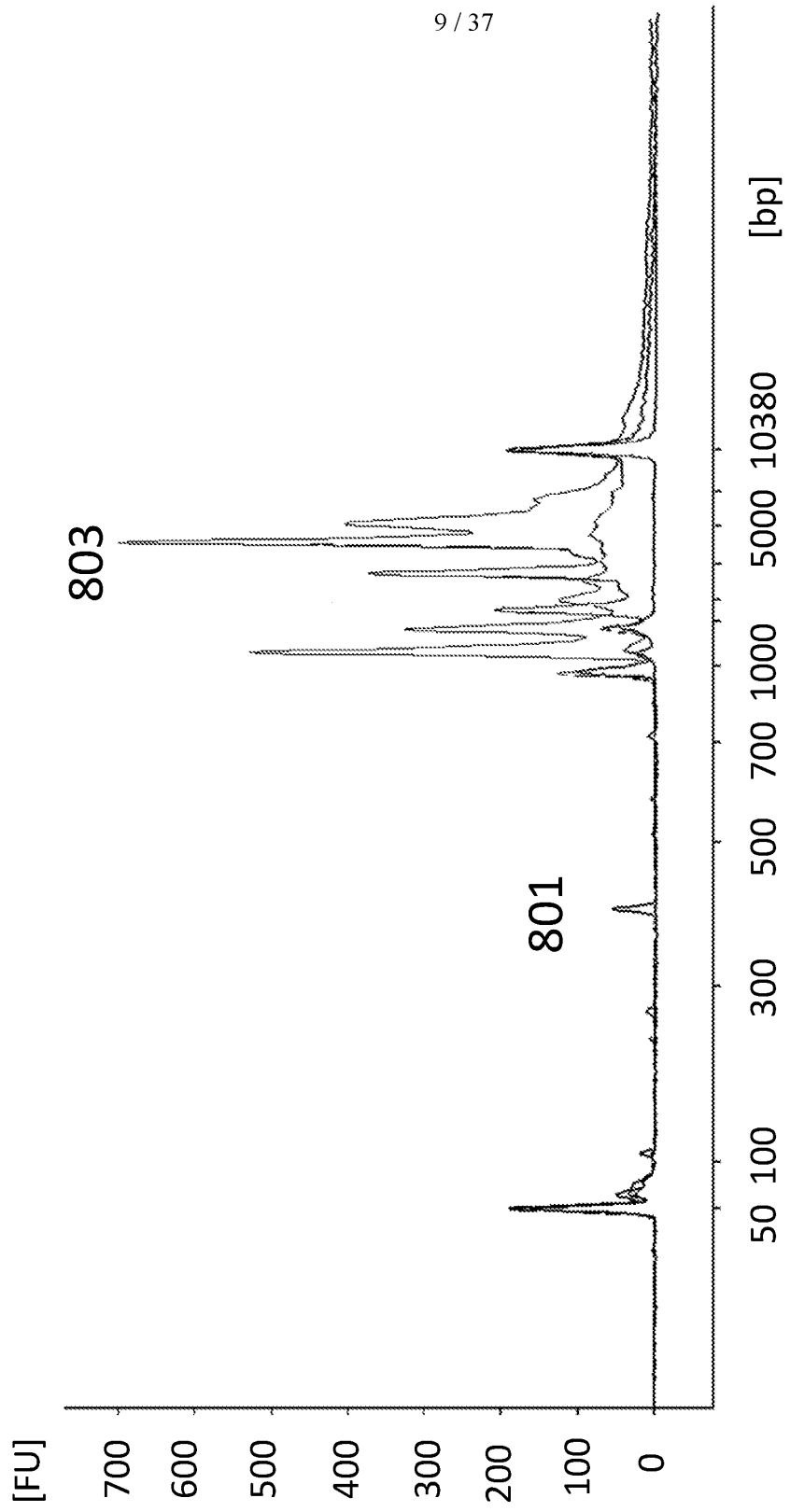

[FU]
700
600
500
400
300
200
100
0
803
801
50 100 300 500 700 1000 5000 10380
[bp]

FIG. 8

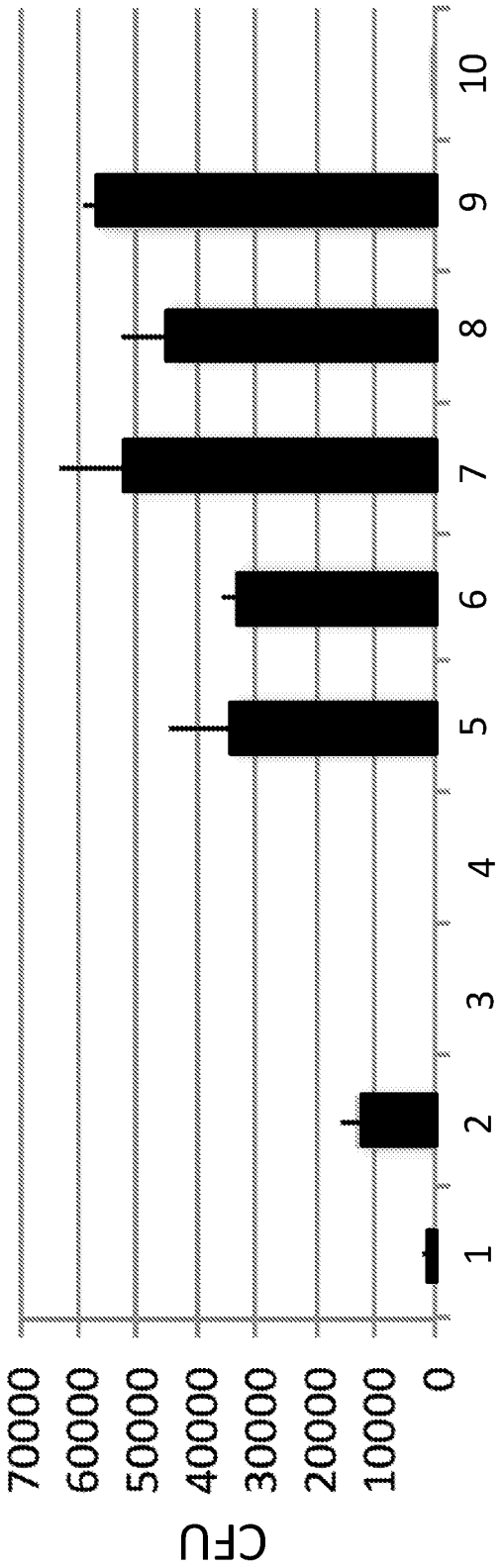

CFU
70000
60000
50000
40000
30000
20000
10000
0
1
2
3
4
5
6
7
8
9
10

FIG. 9

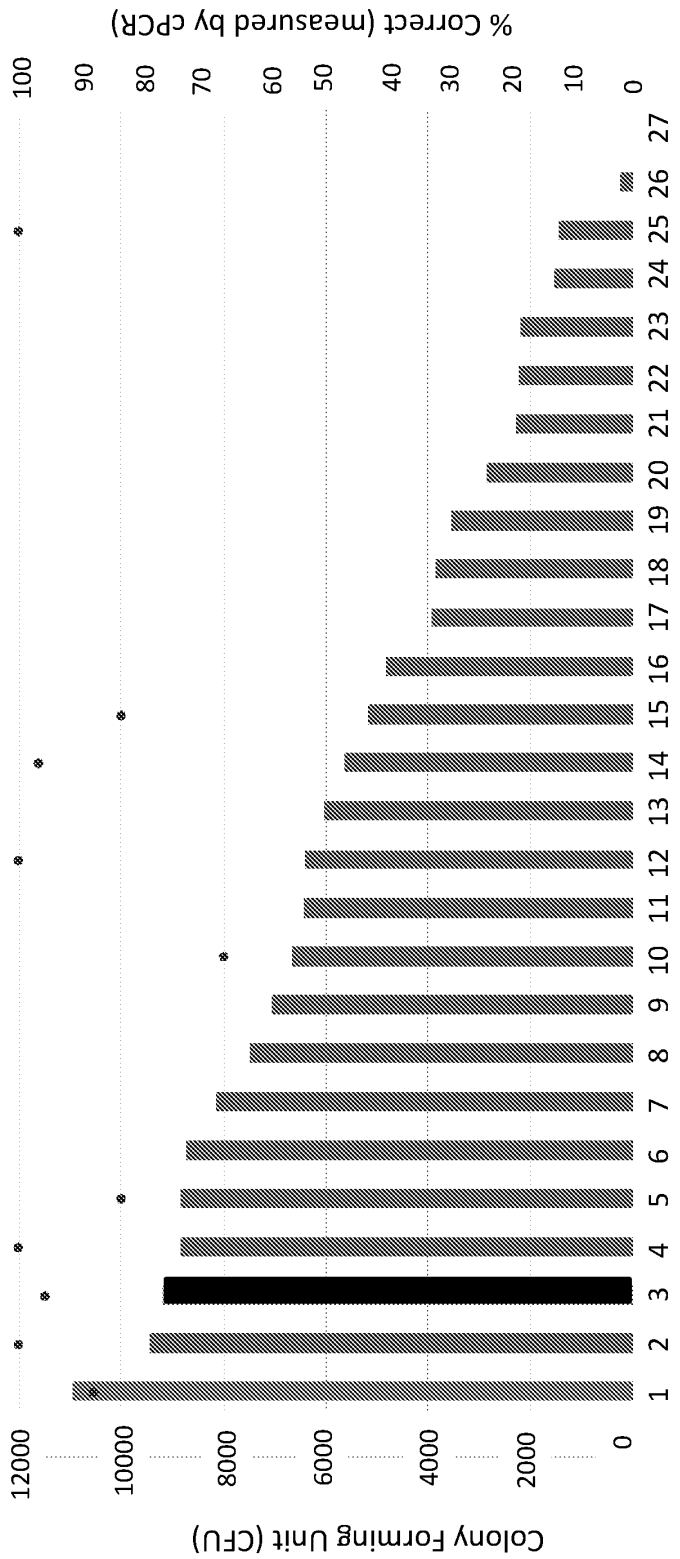

% Correct (measured by cPCR)
100
90
80
70
60
50
40
30
20
10
0
Colony Forming Unit (CFU)
12000
10000
8000
6000
4000
2000
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

FIG. 10

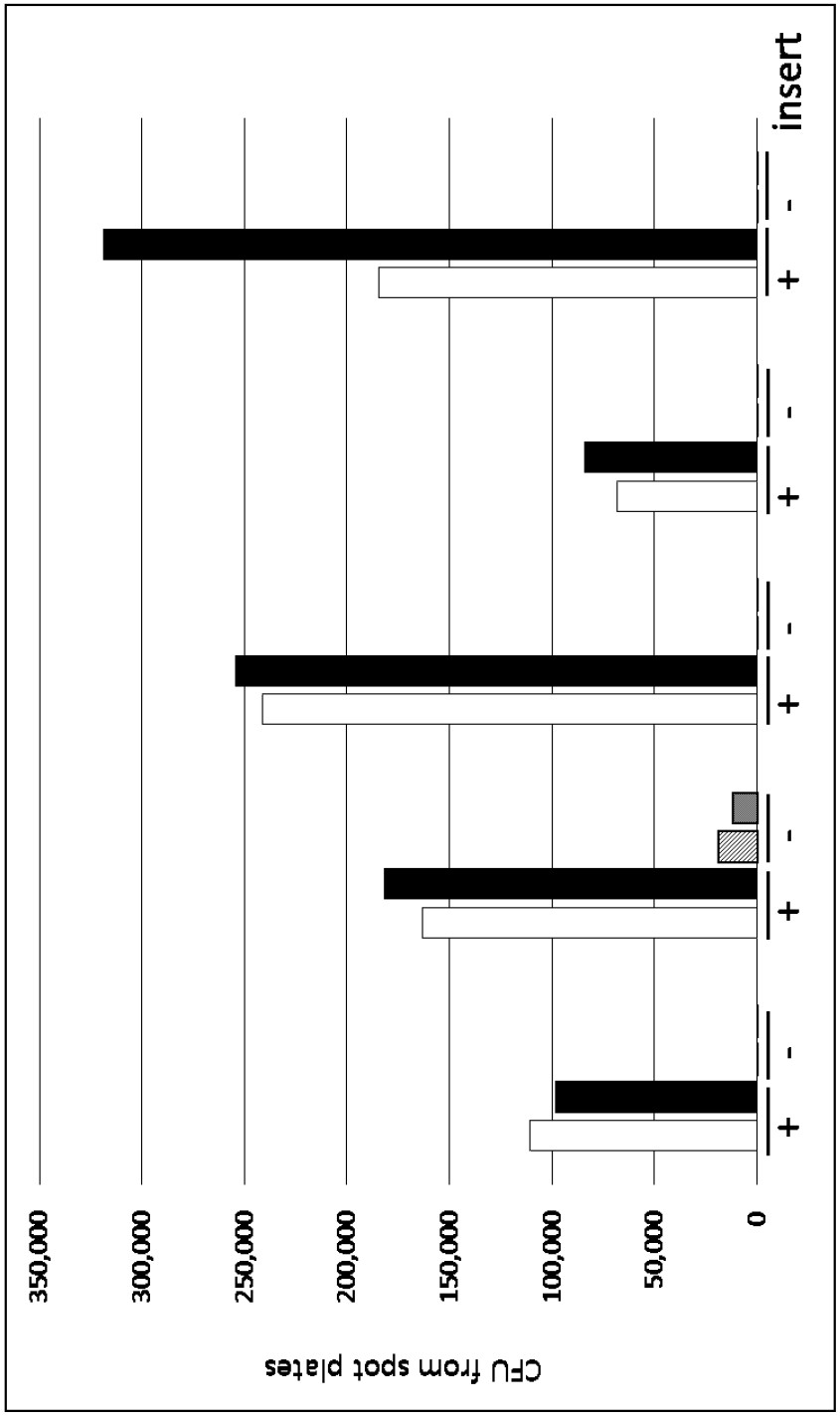

CFU from spot plates
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
+
-
+
-
+
-
+
-
+
-
insert

FIG. 11

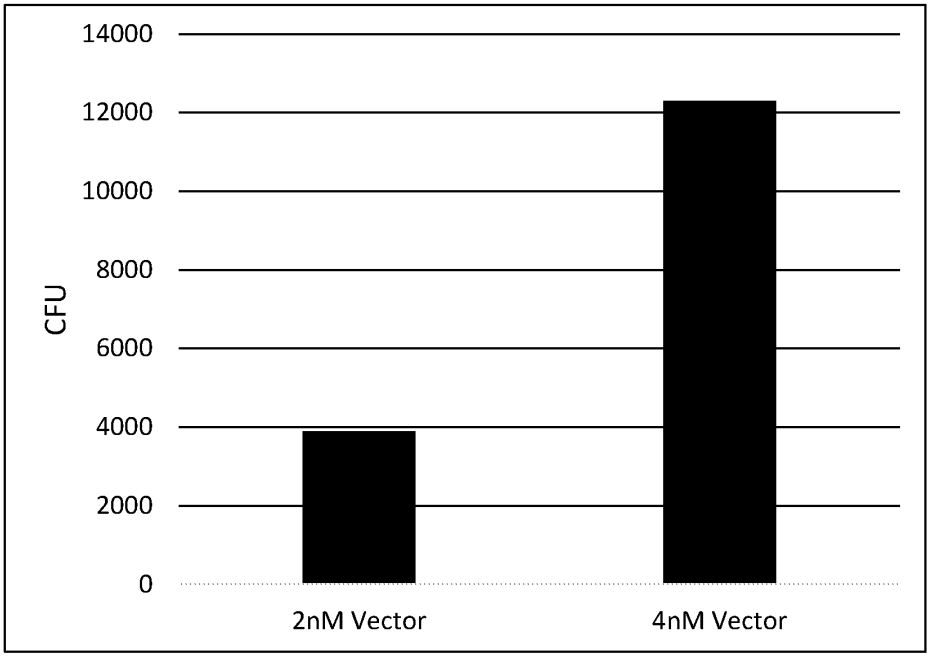

14000
12000
10000
8000
6000
4000
2000
0
CFU
2nM Vector
4nM Vector

FIG. 12

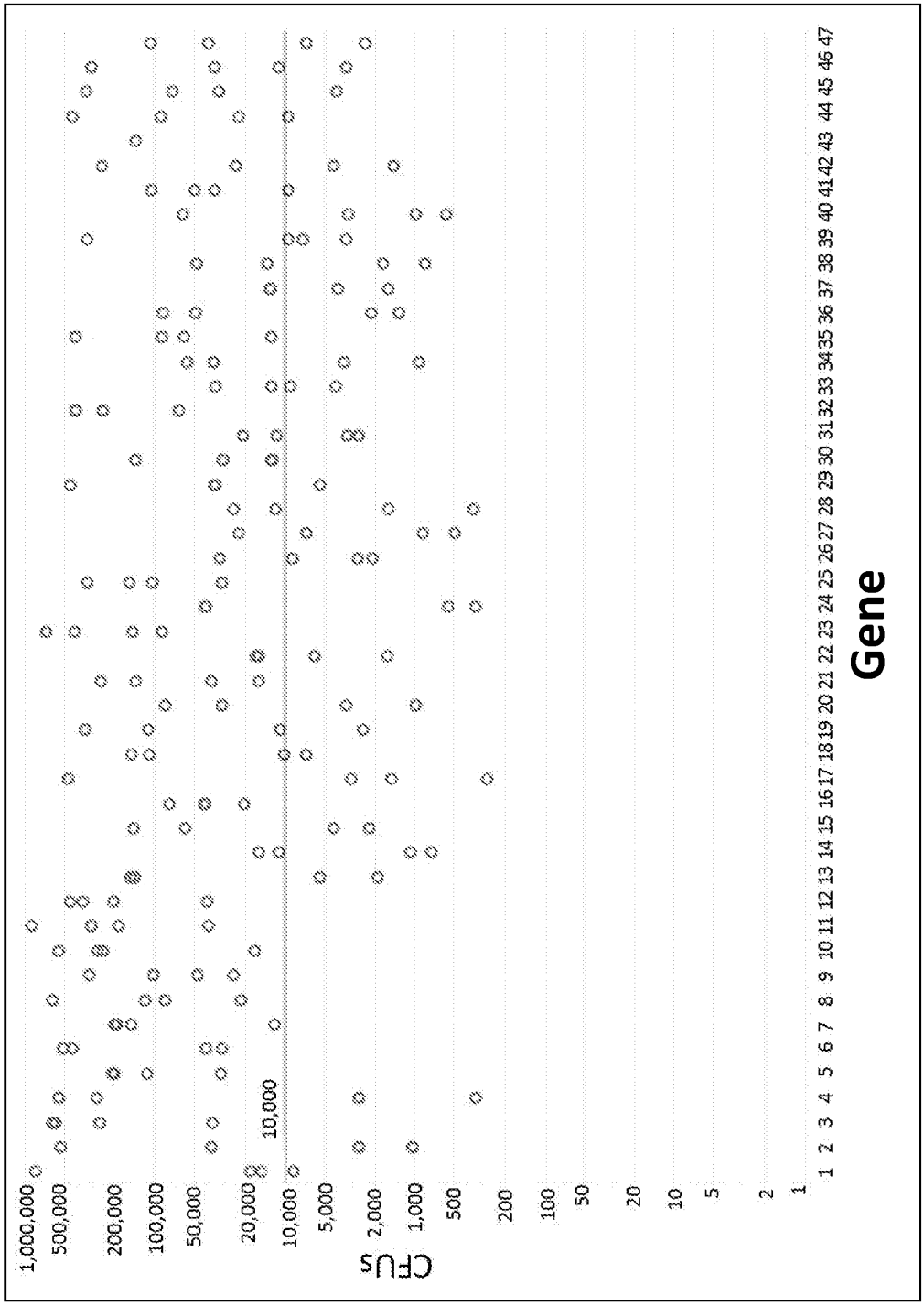

CFUs
1,000,000
500,000
200,000
100,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
Gene

FIG. 13

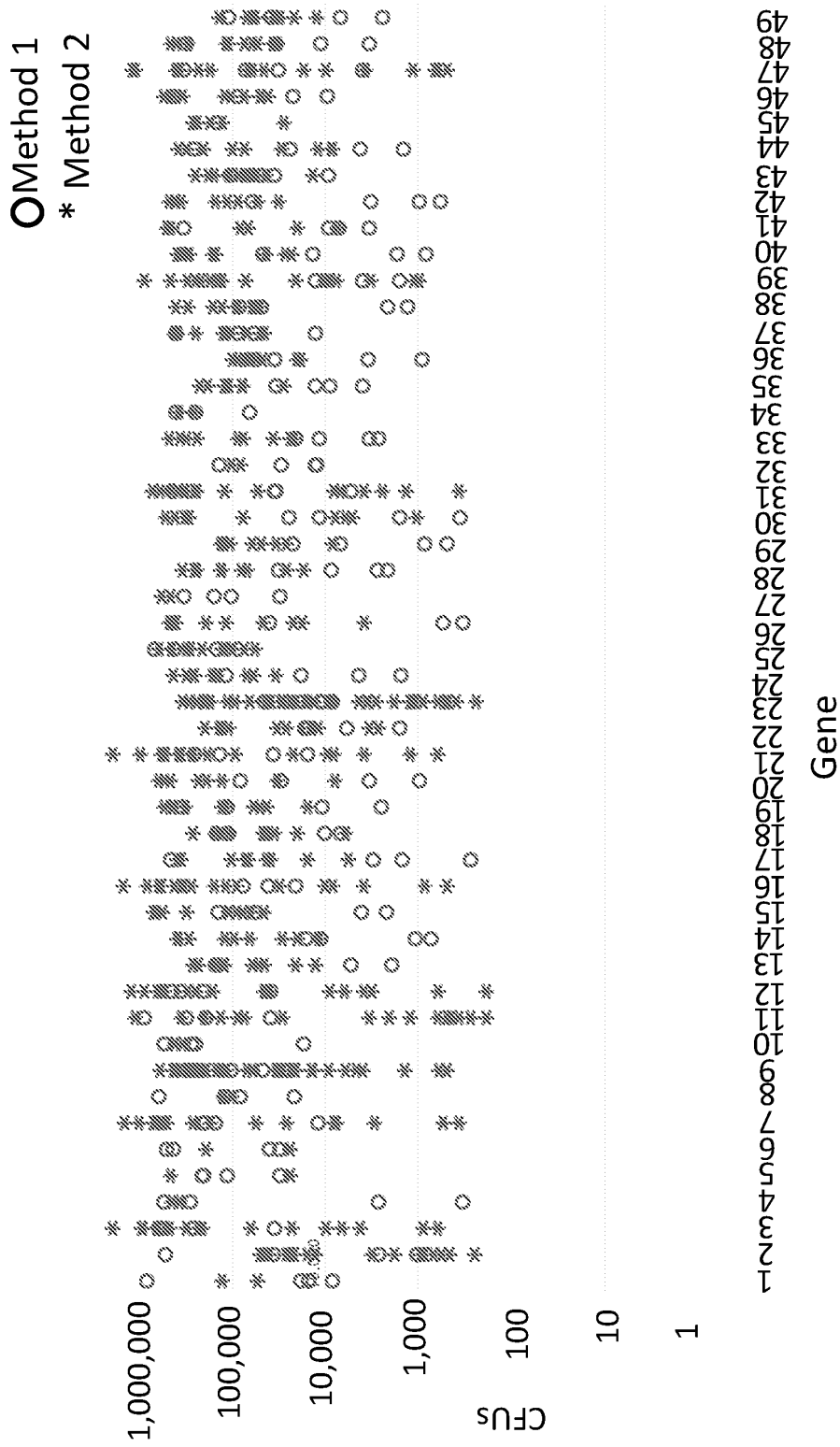

Method 1
Method 2
CFUs
1,000,000
100,000
10,000
1,000
100
10
1
Gene
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49

FIG. 14A

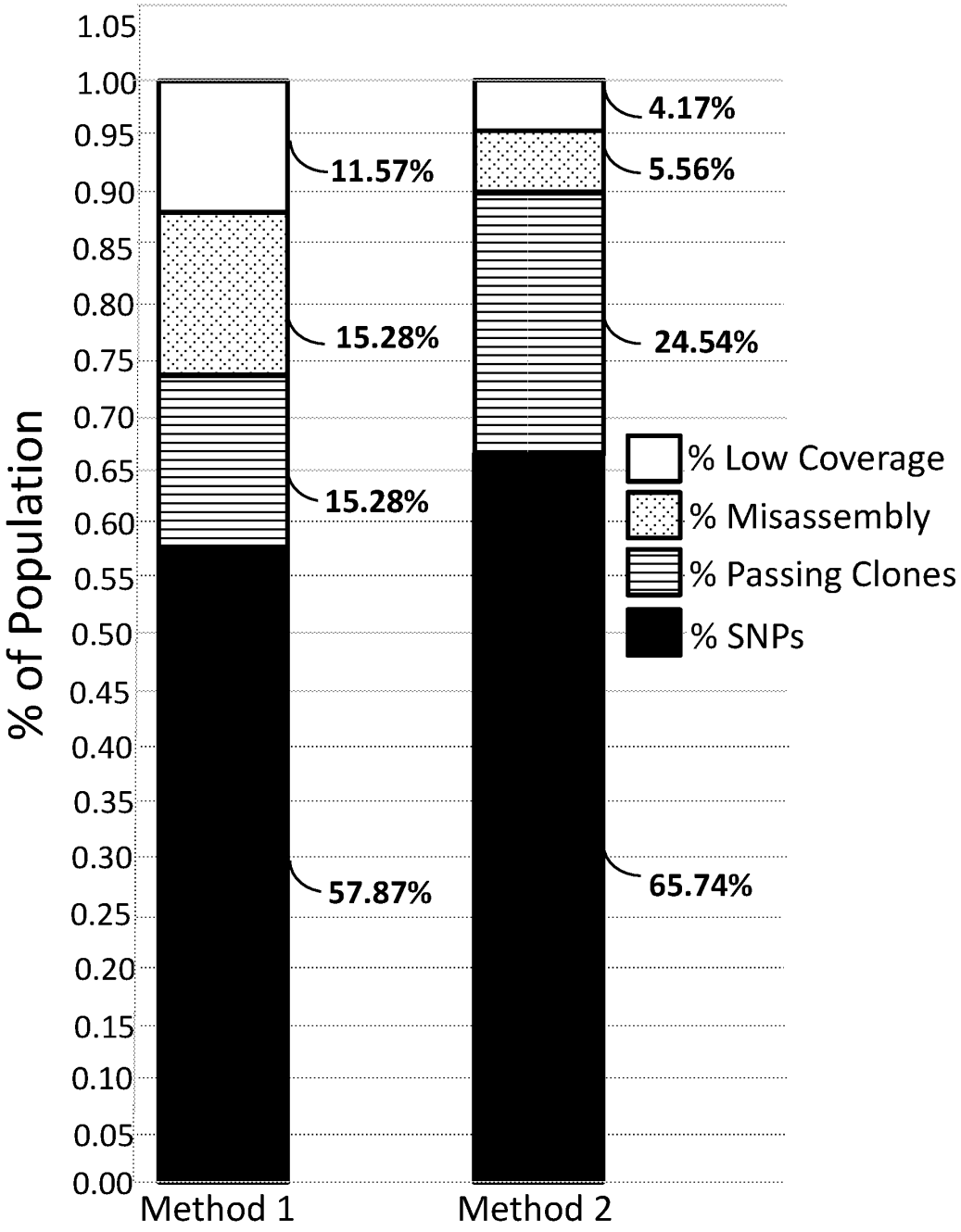

1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
% of Population
11.57%
15.28%
15.28%
57.87%
4.17%
5.56%
24.54%
65.74%
% Low Coverage
% Misassembly
% Passing Clones
% SNPs
Method 1
Method 2

FIG. 14B

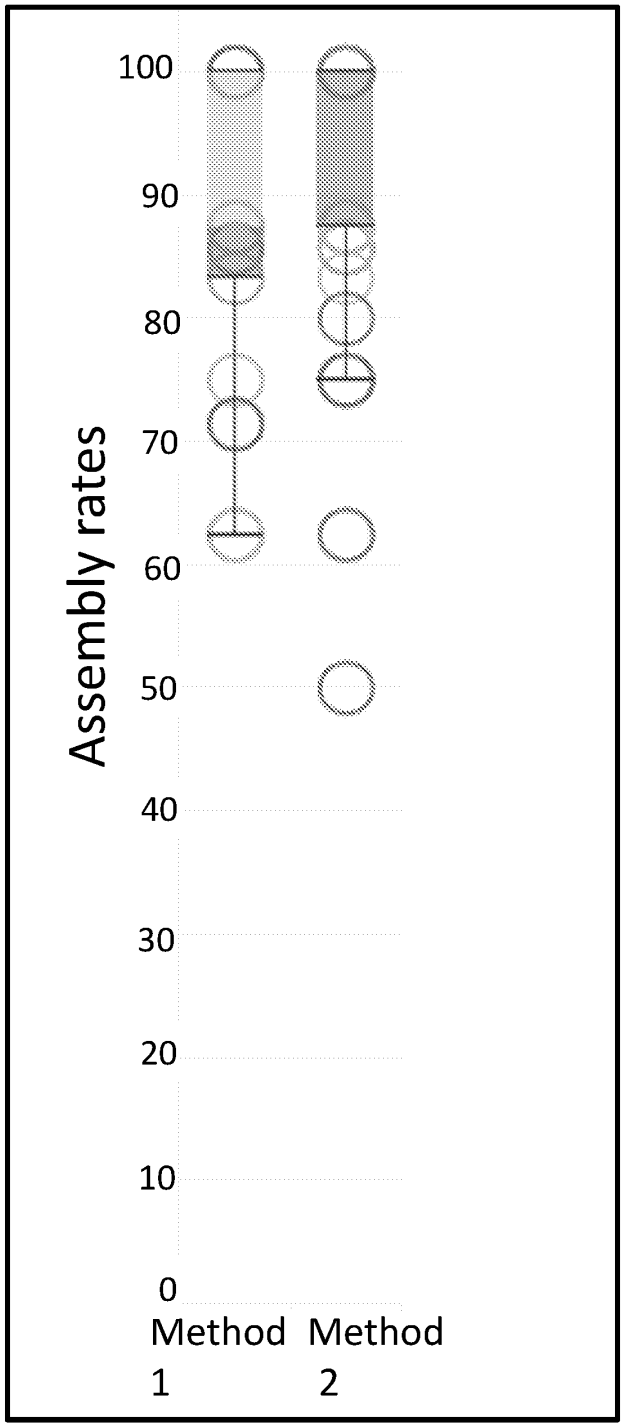


FIG. 14C

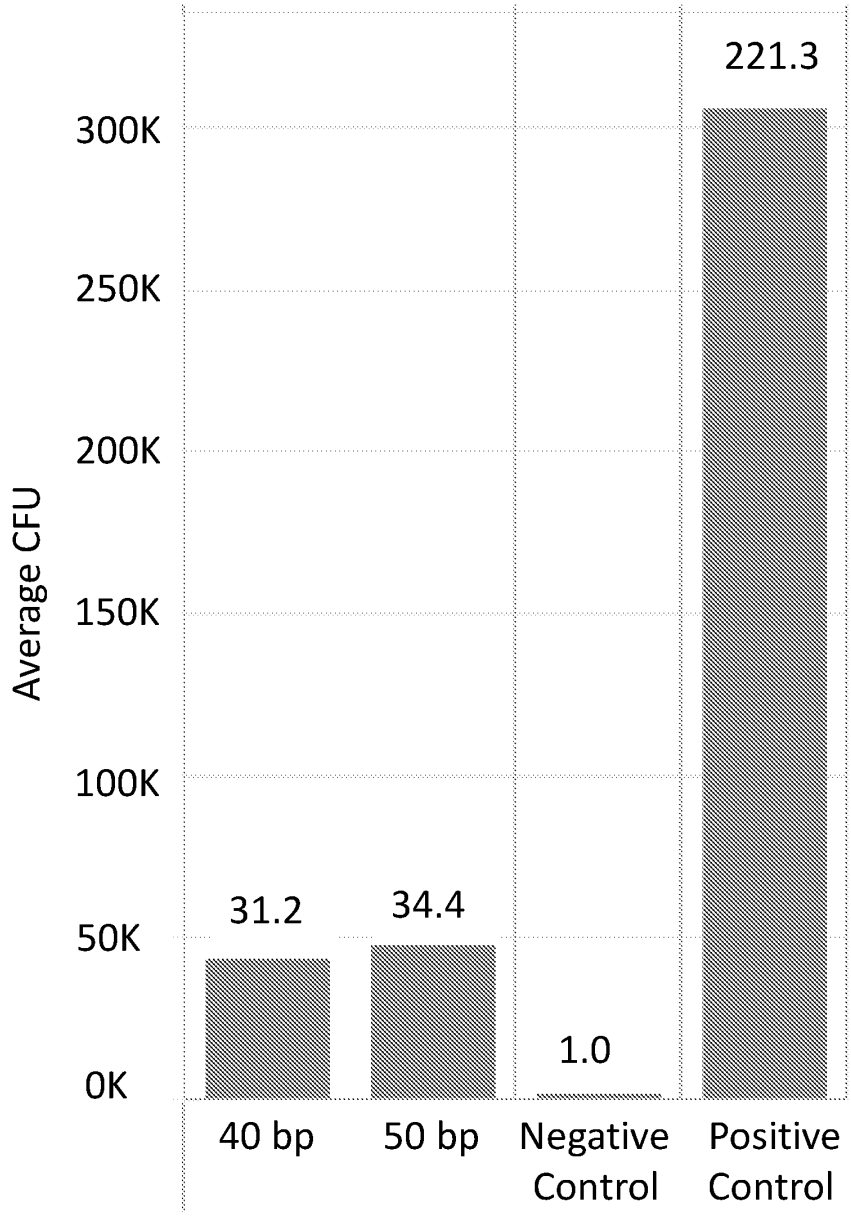

Average CFU
300K
250K
200K
150K
100K
50K
0K
31.2
34.4
1.0
221.3
40 bp
50 bp
Negative Control
Positive Control

FIG. 15A

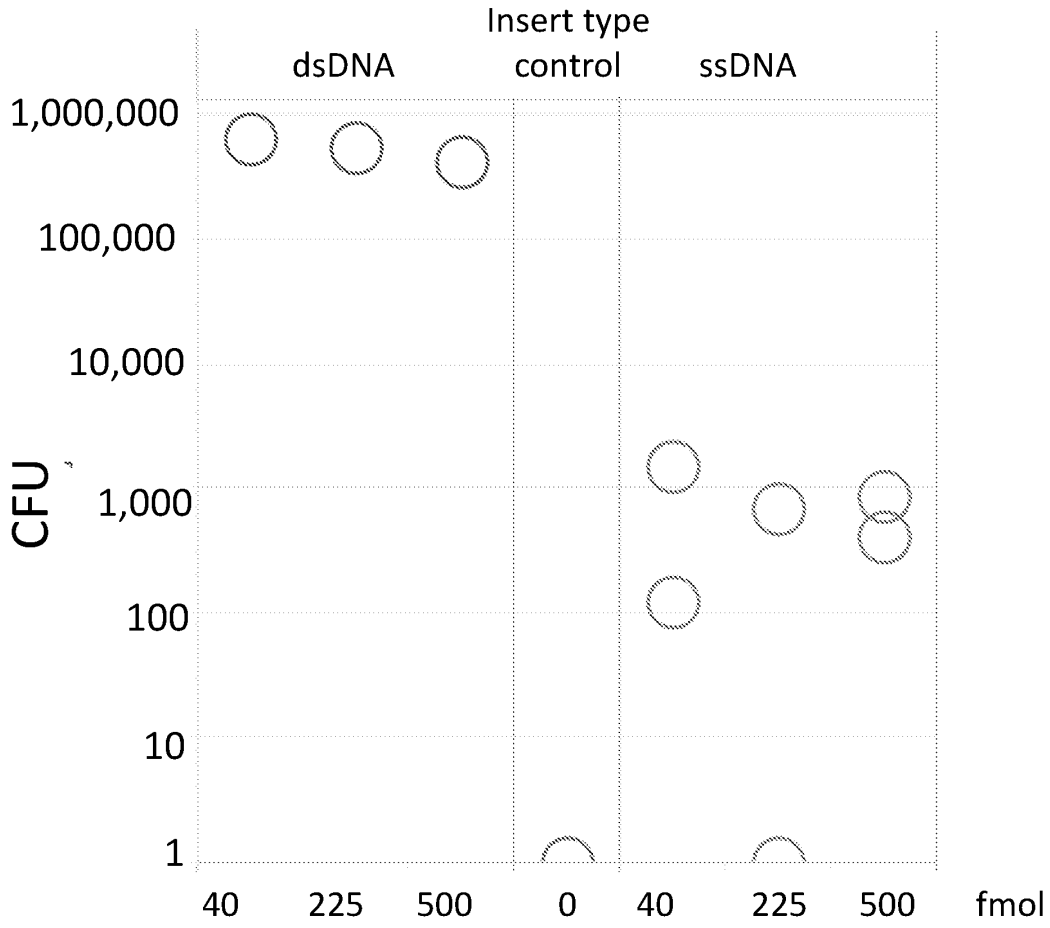

Insert type
dsDNA
control
ssDNA
1,000,000
100,000
10,000
1,000
100
10
1
CFU
40
225
500
0
40
225
500
fmol

FIG. 15B

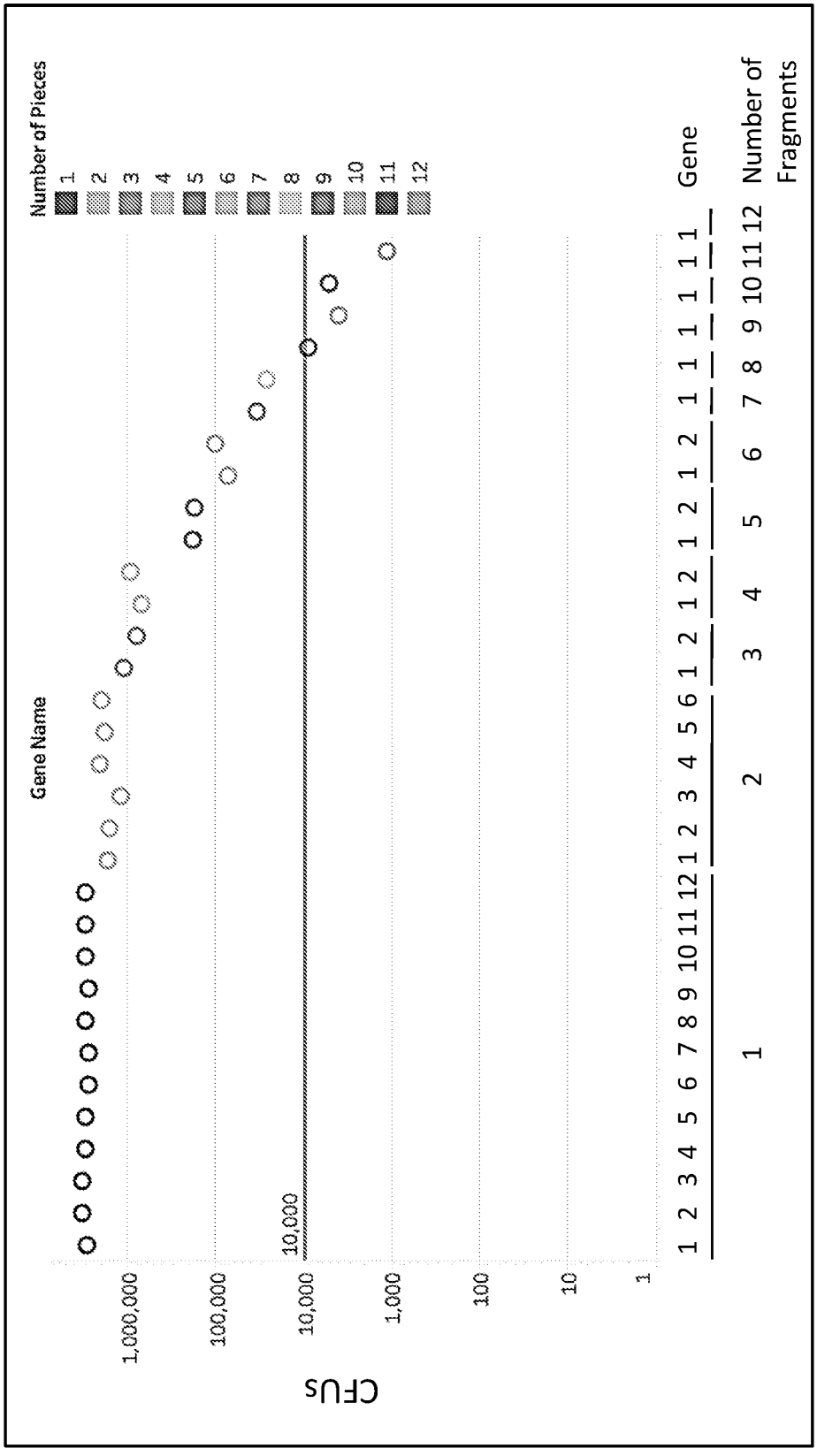

Number of Pieces
1
2
3
4
5
6
7
8
9
10
11
12
Gene Name
CFUs
1,000,000
100,000
10,000
1,000
100
10
1
10,000
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 1 2 1 2 1 2 1 2 1 2 1 2 1 1 1 1 1 1 1
1 2 3 4 5 6 7 8 9 10 11 12
Gene
Number of Fragments

FIG. 16A

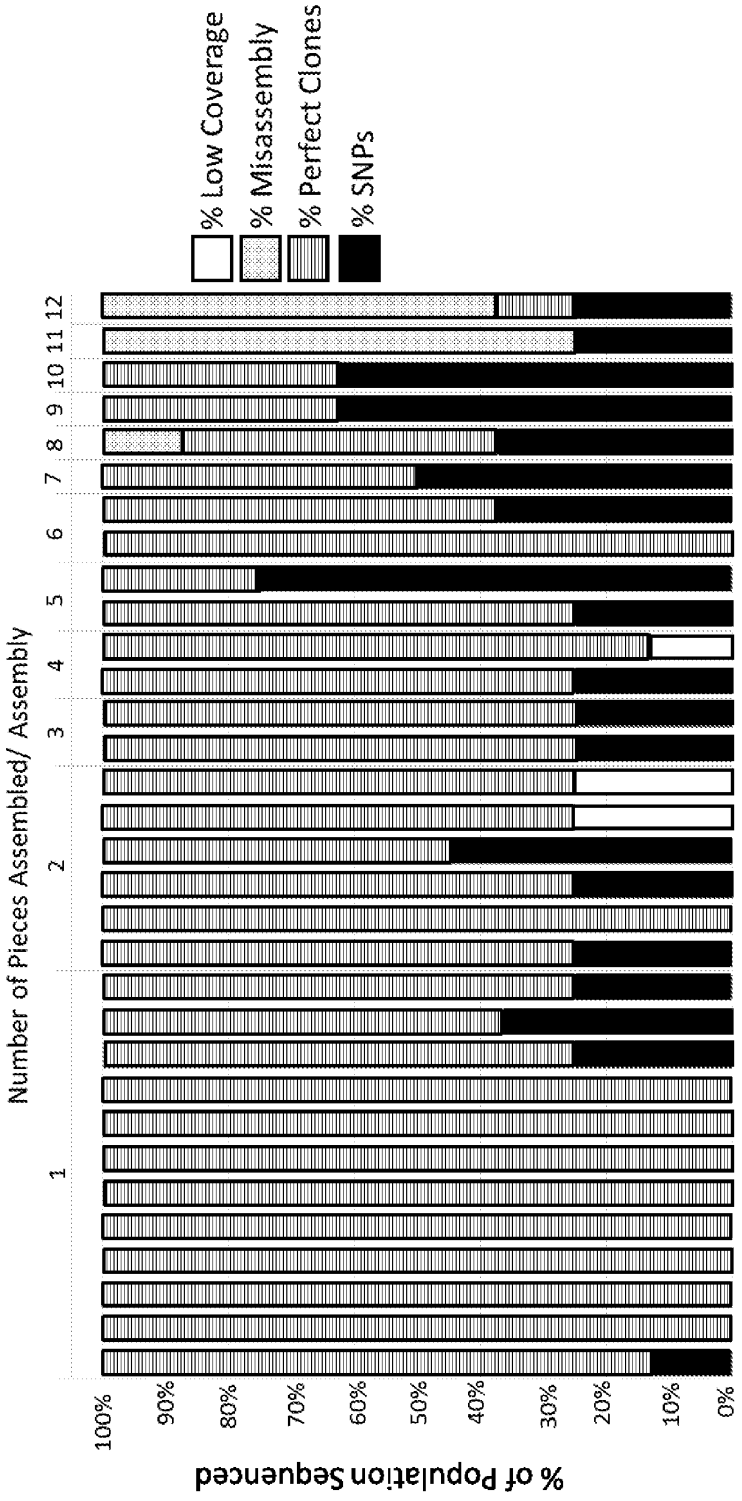

% Low Coverage
% Misassembly
% Perfect Clones
% SNPs
Number of Pieces Assembled/ Assembly
1
2
3
4
5
6
7
8
9
10
11
12
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of Population Sequenced

FIG. 16B

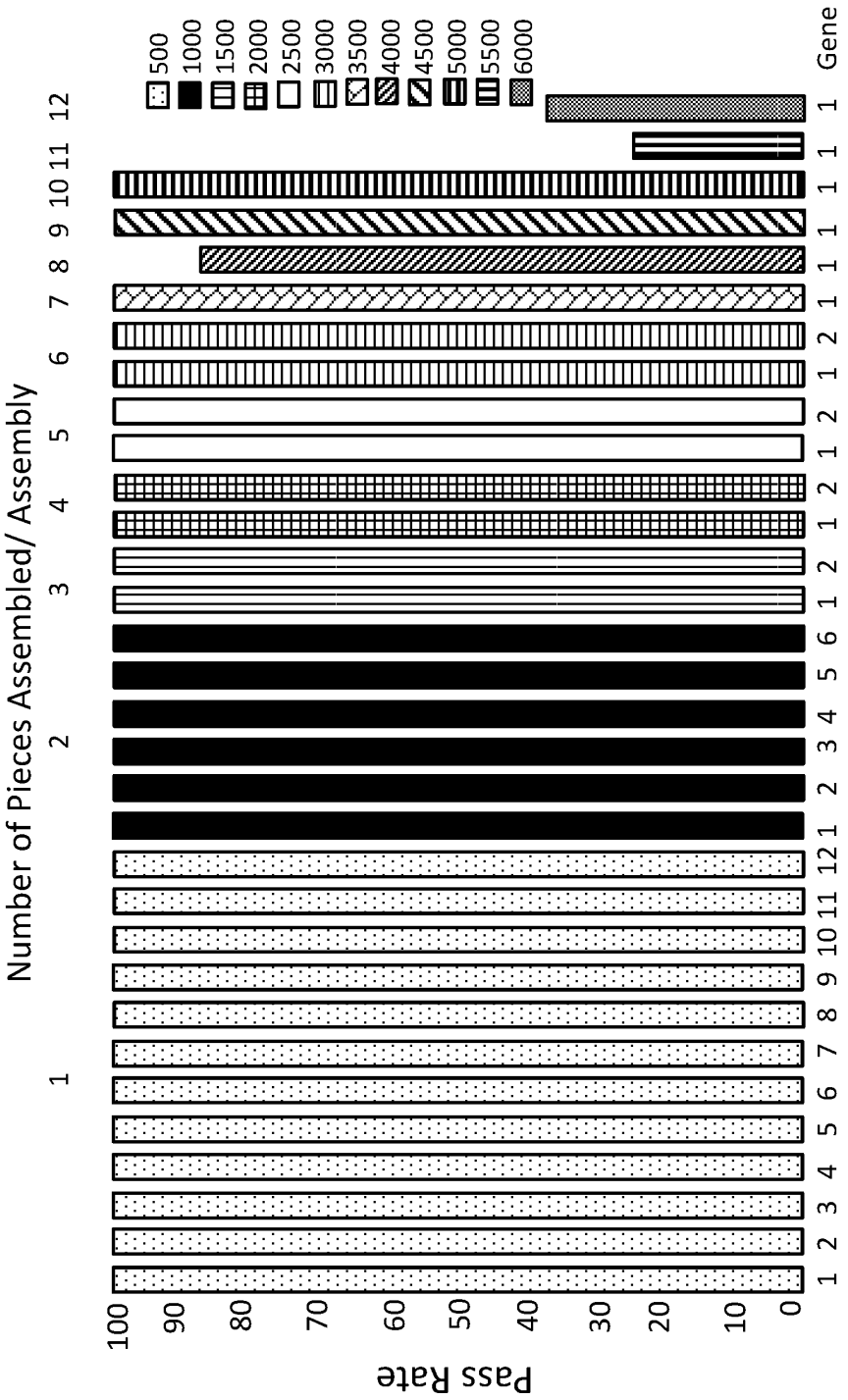

Pass Rate
100
90
80
70
60
50
40
30
20
10
0
Number of Pieces Assembled/ Assembly
1
2
3
4
5
6
7
8
9
10
11
12
Gene
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000

FIG. 16C

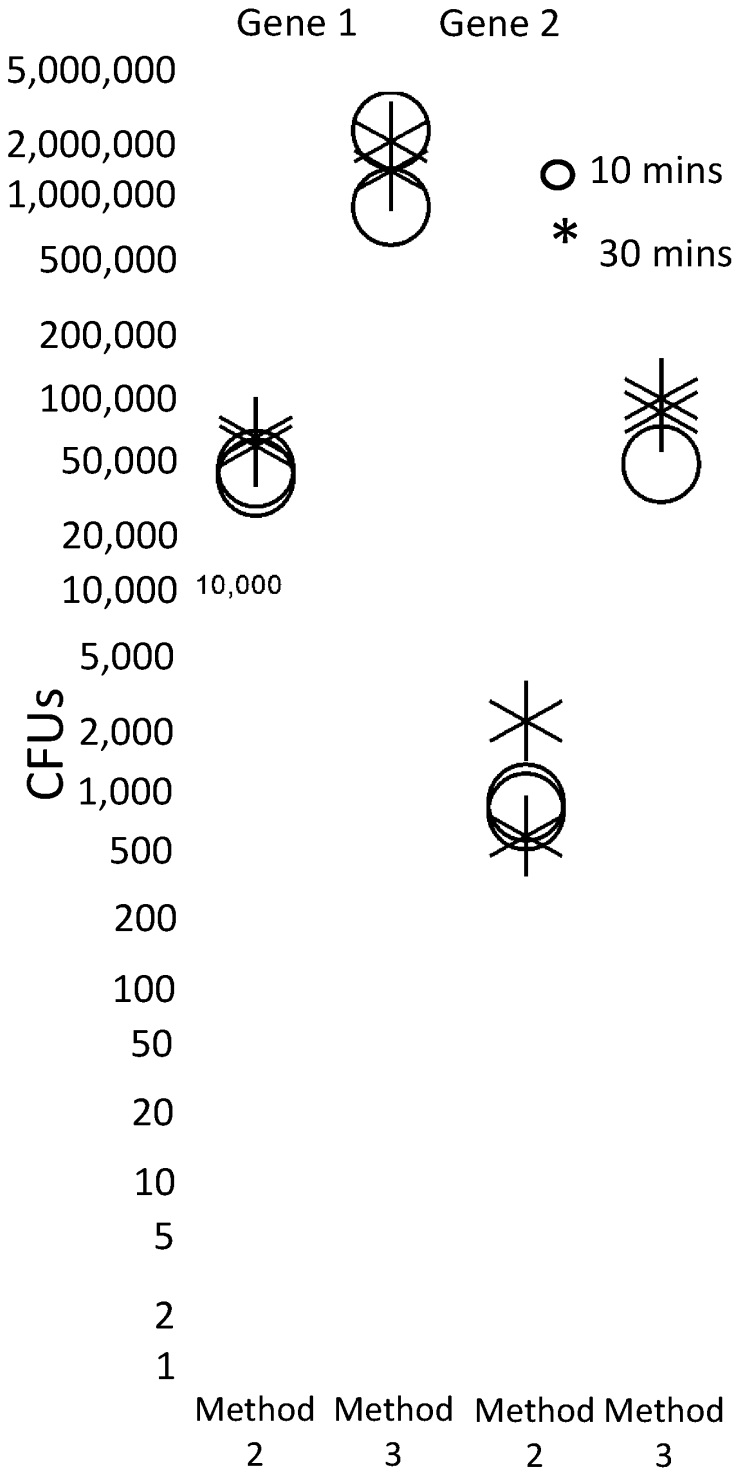

Gene 1
Gene 2
10 mins
30 mins
5,000,000
2,000,000
1,000,000
500,000
200,000
100,000
50,000
20,000
10,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
5
2
1
CFUs
Method 2
Method 3
Method 2
Method 3

FIG. 17

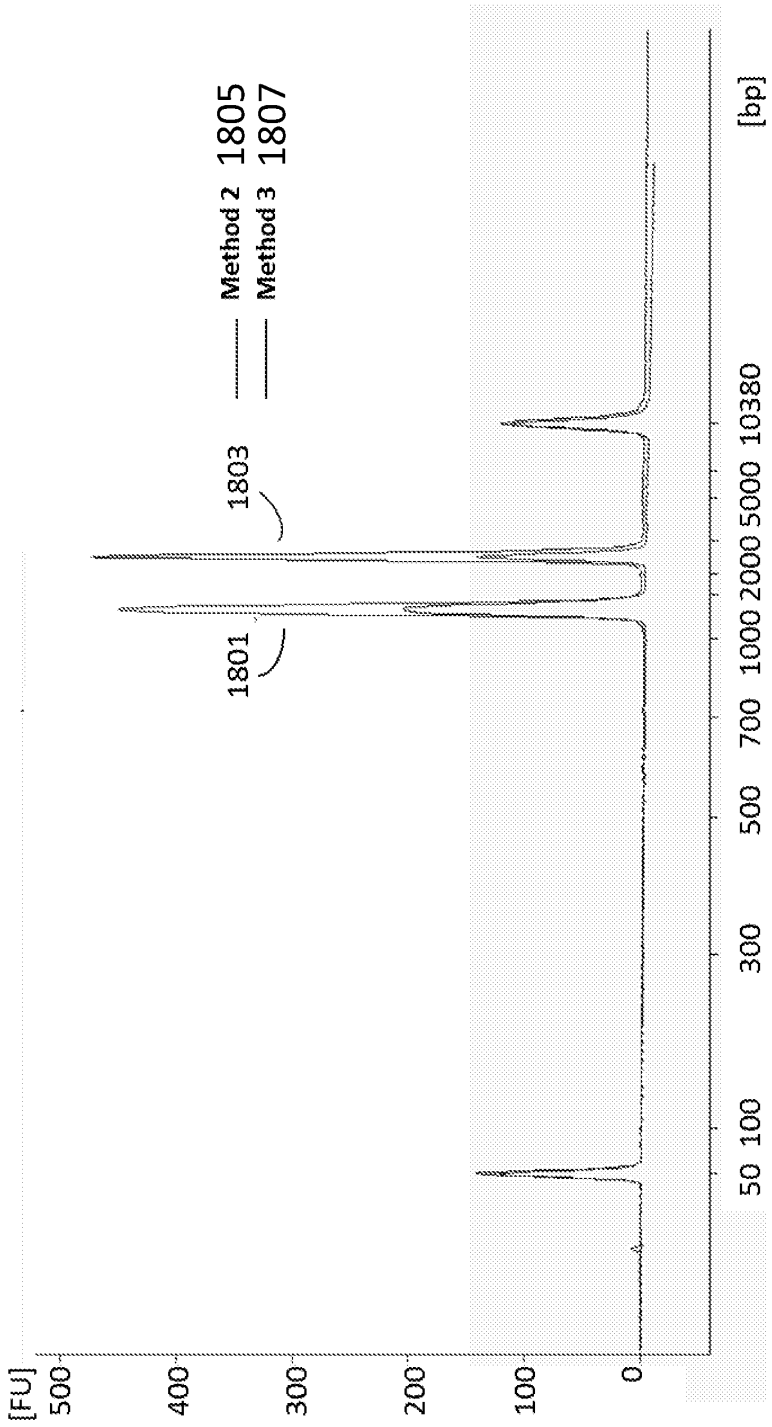

[FU]
500
400
300
200
100
0
50 100 300 500 700 1000 2000 5000 10380
[bp]
1801
1803
Method 2 1805
Method 3 1807

FIG. 18A

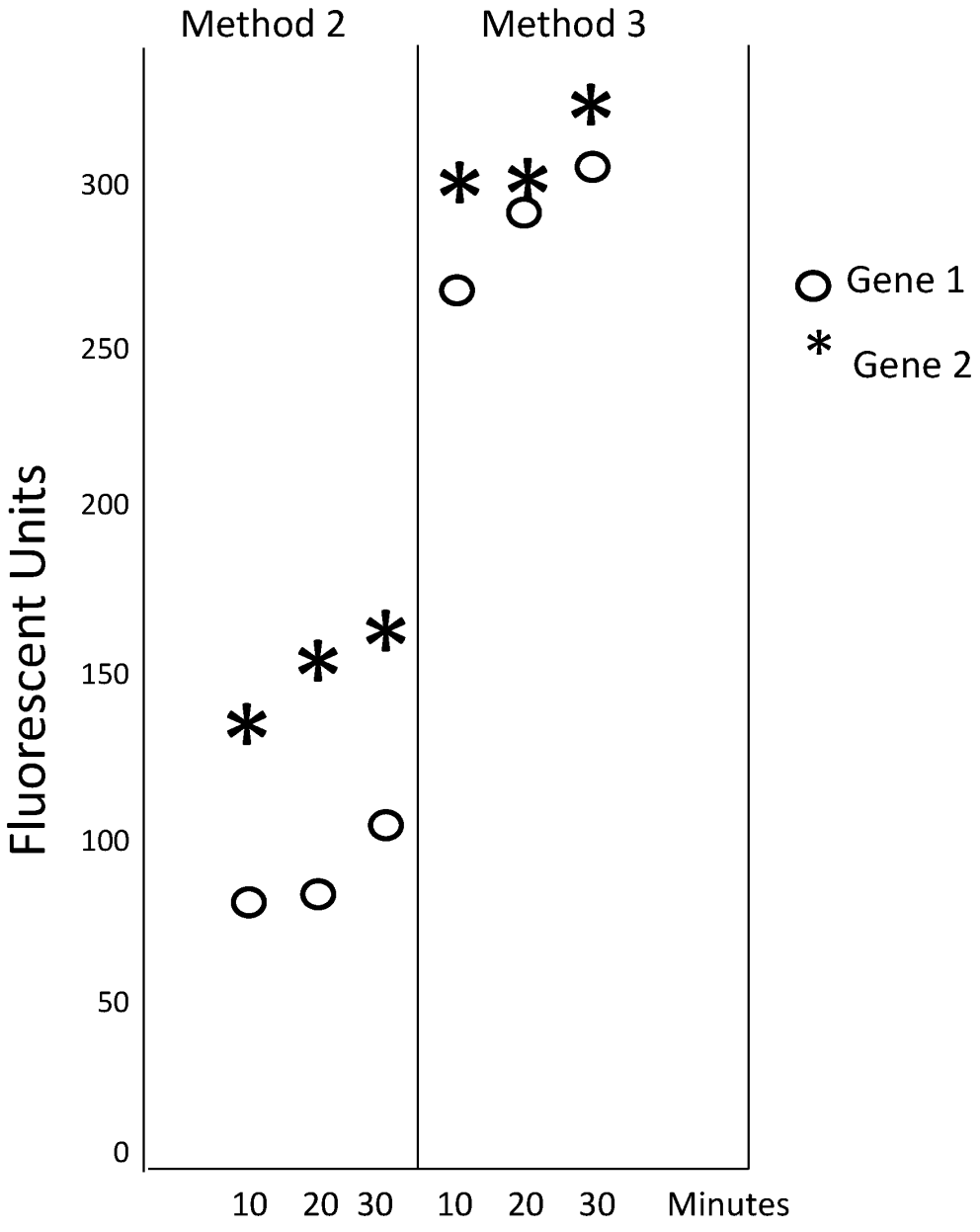

Method 2
Method 3
Fluorescent Units
300
250
200
150
100
50
0
10
20
30
10
20
30
Minutes
Gene 1
Gene 2

FIG. 18B

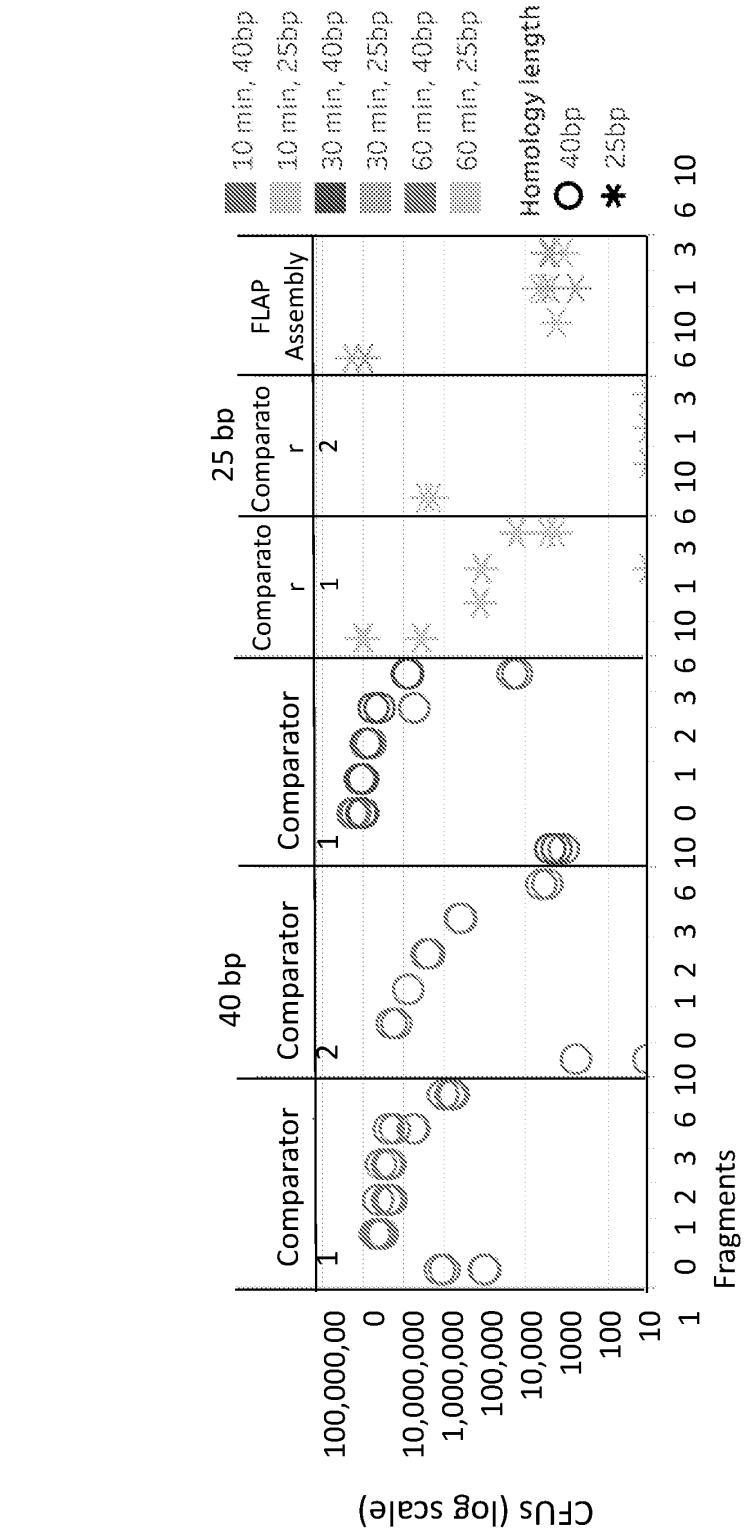

10 min, 40bp
10 min, 25bp
30 min, 40bp
30 min, 25bp
60 min, 40bp
60 min, 25bp
Homology length
40bp
25bp
40 bp
25 bp
Comparator
Comparator
Comparator
Comparator
Comparator
FLAP Assembly
CFUs (log scale)
100,000,000
10,000,000
1,000,000
100,000
10,000
1000
100
10
1
Fragments

FIG. 19A

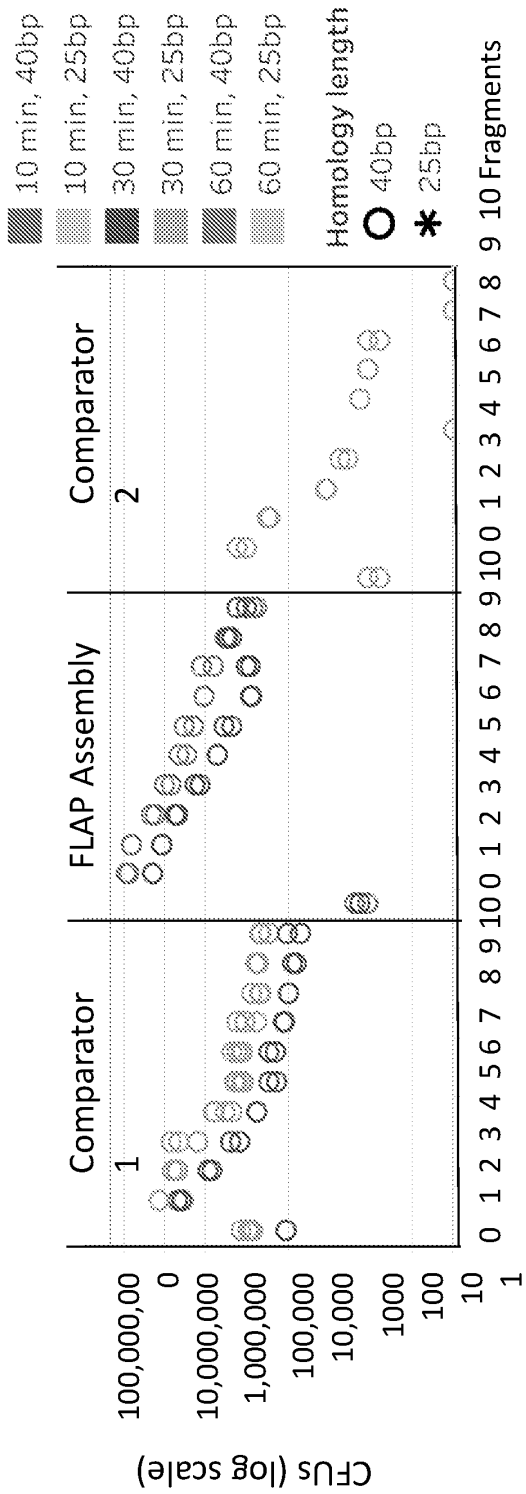

CFUs (log scale)
100,000,00
0
10,000,000
1,000,000
100,000
10,000
1000
100
10
1
Comparator
FLAP Assembly
Comparator
1
2
0 1 2 3 4 5 6 7 8 9 10 0 1 2 3 4 5 6 7 8 9 10 0 1 2 3 4 5 6 7 8 9 10 Fragments
10 min, 40bp
10 min, 25bp
30 min, 40bp
30 min, 25bp
60 min, 40bp
60 min, 25bp
Homology length
40bp
25bp

FIG. 19B

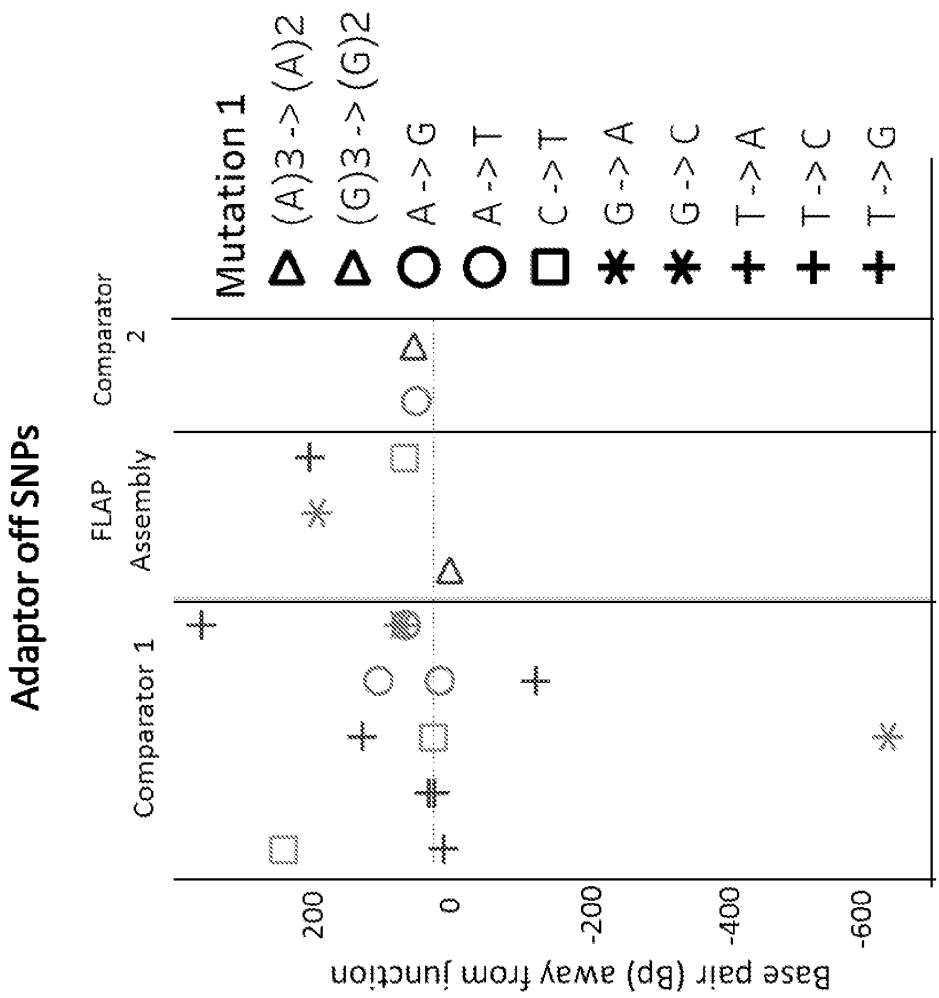

Adaptor off SNPs
Comparator 1
FLAP Assembly
Comparator 2
Mutation 1
(A)3 -> (A)2
(G)3 -> (G)2
A -> G
A -> T
C -> T
G -> A
G -> C
T -> A
T -> C
T -> G
Base pair (Bp) away from junction
200
0
-200
-400
-600
1 2 3 6 10 2 3 10 3 10

FIG. 20A

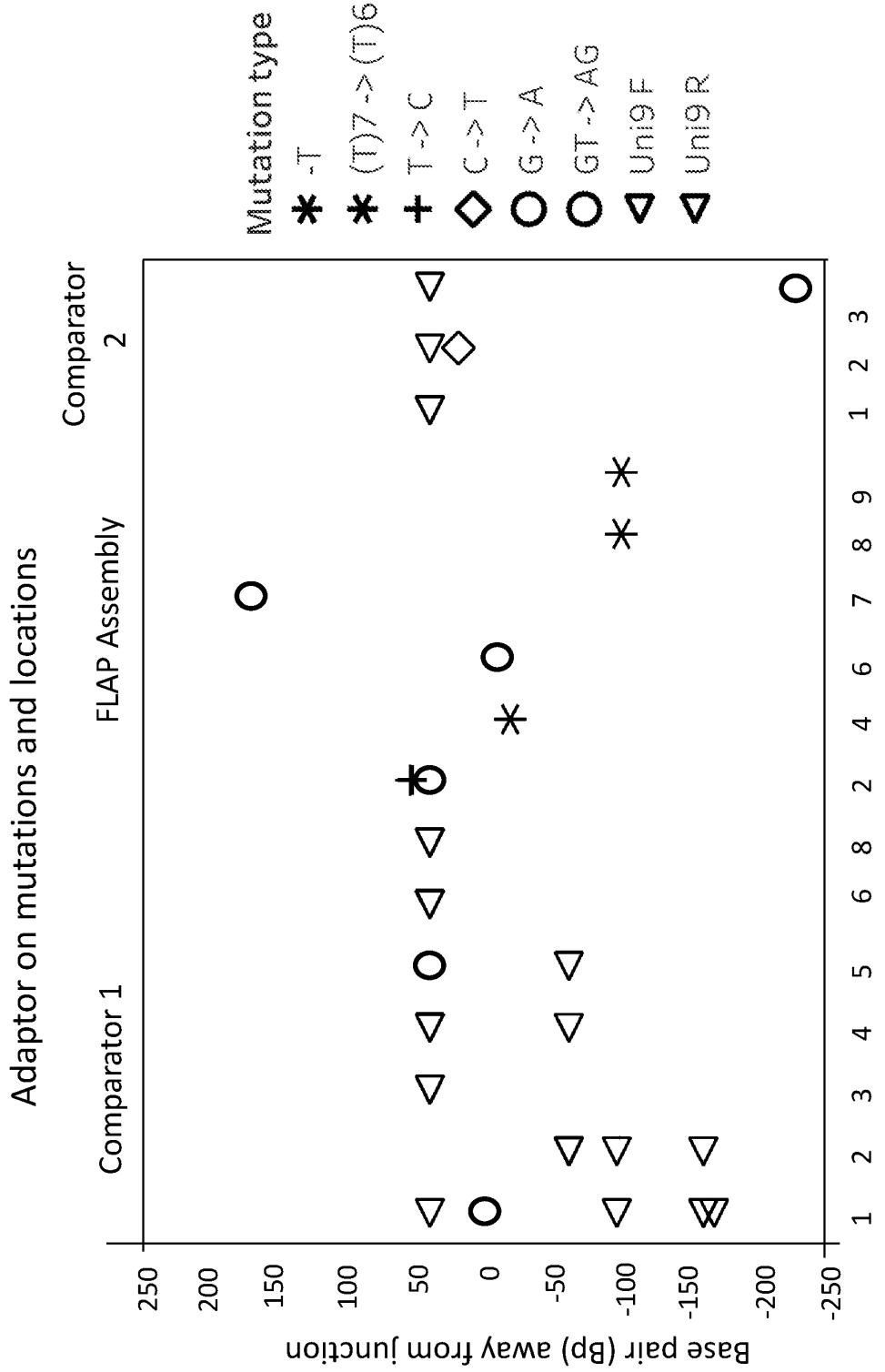

Adaptor on mutations and locations
Comparator 1
FLAP Assembly
Comparator 2
Mutation type
-T
(T)7 -> (T)6
T -> C
C -> T
G -> A
GT -> AG
Uni9 F
Uni9 R
Base pair (Bp) away from junction
250
200
150
100
50
0
-50
-100
-150
-200
-250
1 2 3 4 5 6 8 2 4 6 7 8 9 1 2 3
Number of Fragments

FIG. 20B

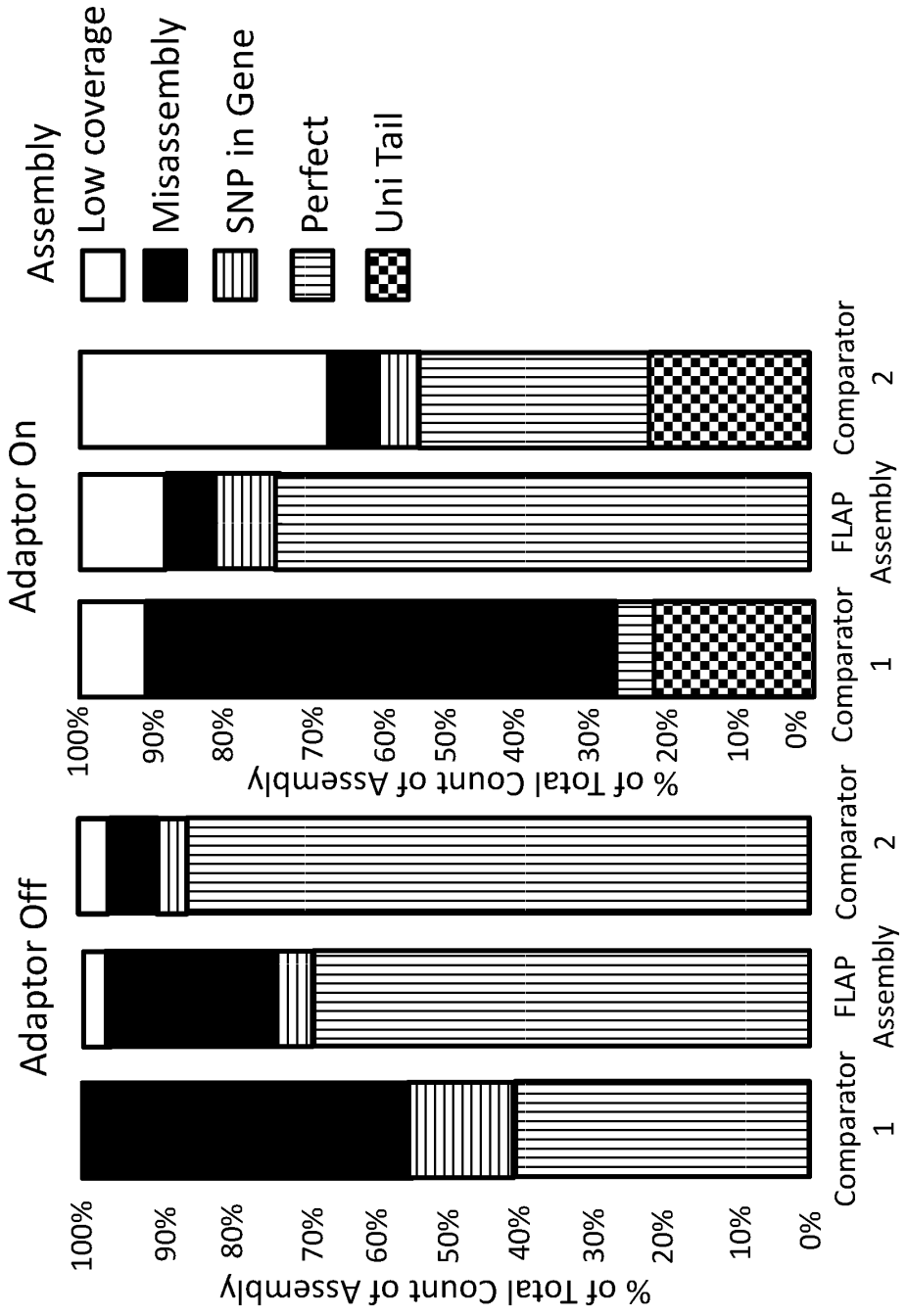

Assembly
Low coverage
Misassembly
SNP in Gene
Perfect
Uni Tail
Adaptor On
Adaptor Off
% of Total Count of Assembly
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Comparator 1
FLAP Assembly
Comparator 2

FIG. 20C

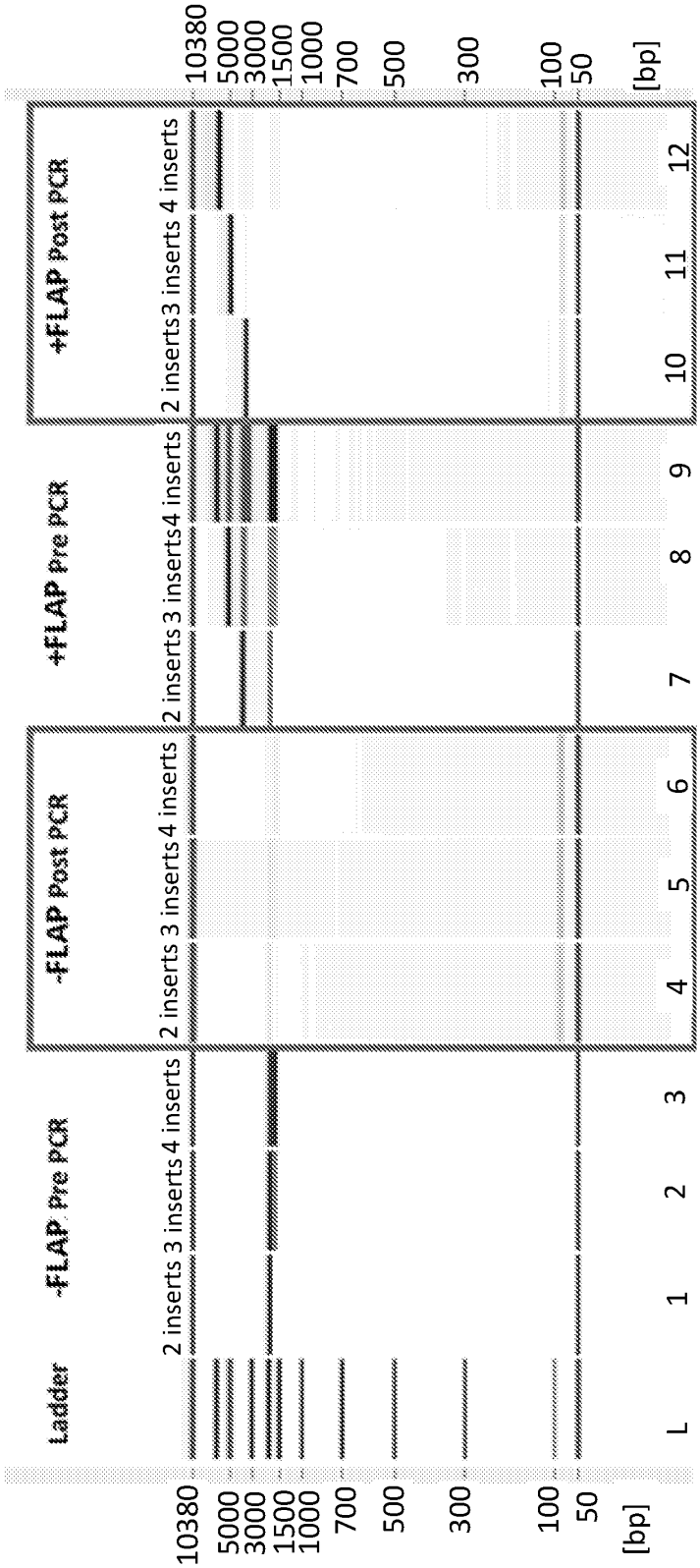

Ladder
-FLAP Pre PCR
-FLAP Post PCR
+FLAP Pre PCR
+FLAP Post PCR
2 inserts
3 inserts
4 inserts
L
1
2
3
4
5
6
7
8
9
10
11
12
10380
5000
3000
1500
1000
700
500
300
100
50
[bp]

FIG. 21A

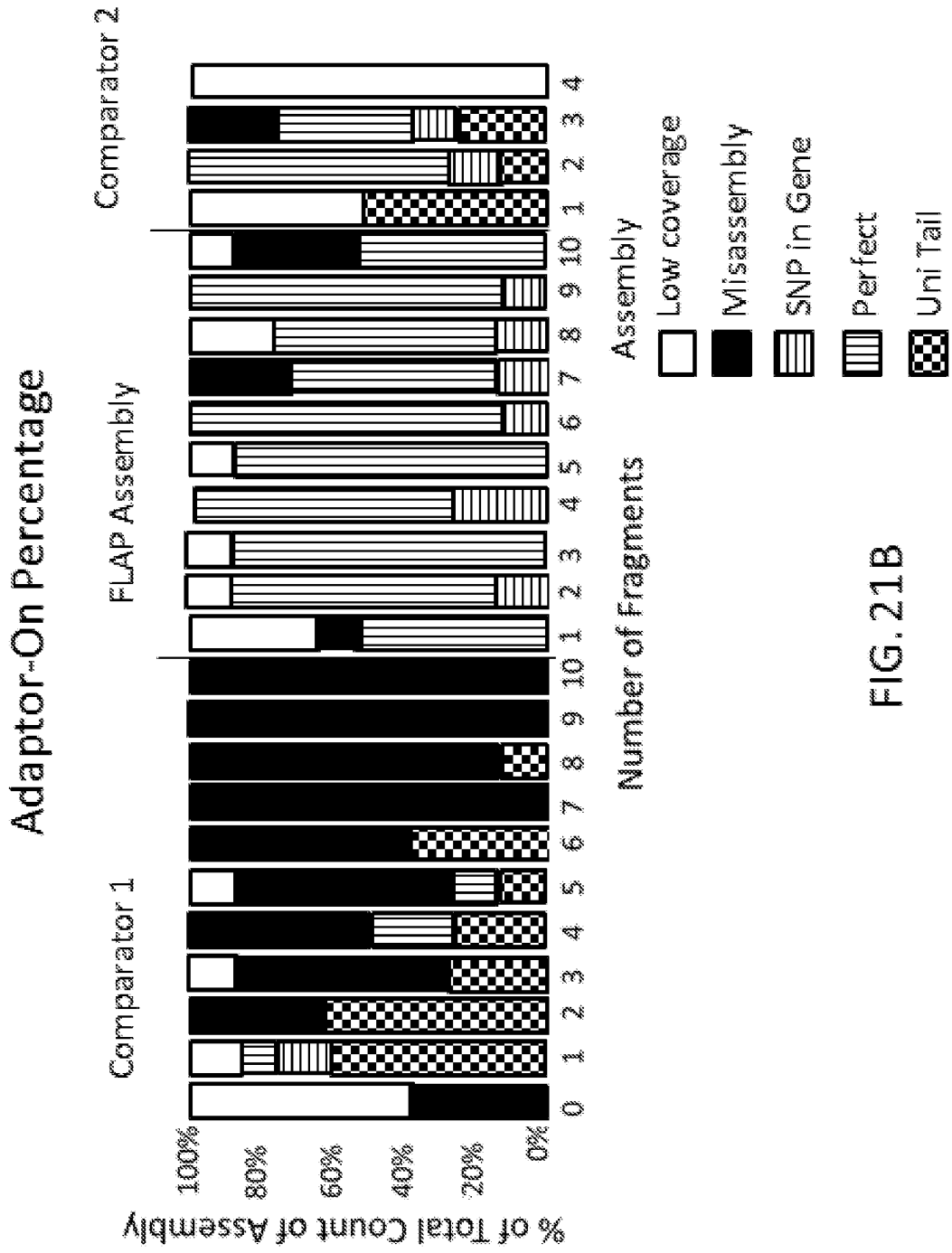

Adaptor-On Percentage
Comparator 1
FLAP Assembly
Comparator 2
% of Total Count of Assembly
100%
80%
60%
40%
20%
0%
0 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 1 2 3 4
Number of Fragments
Assembly
Low coverage
Misassembly
SNP in Gene
Perfect
Uni Tail

FIG. 21B

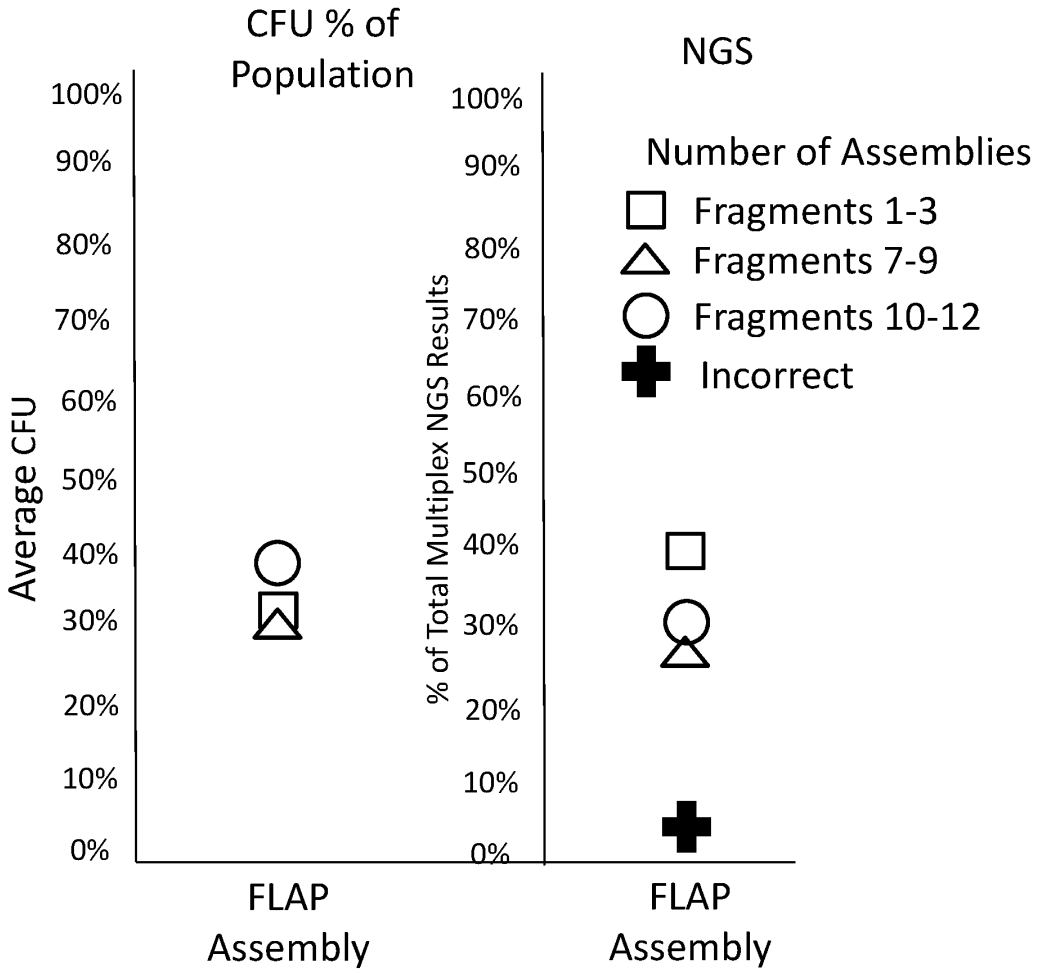

CFU % of Population
Average CFU
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
FLAP Assembly
NGS
% of Total Multiplex NGS Results
Number of Assemblies
Fragments 1-3
Fragments 7-9
Fragments 10-12
Incorrect
FLAP Assembly

FIG. 21C

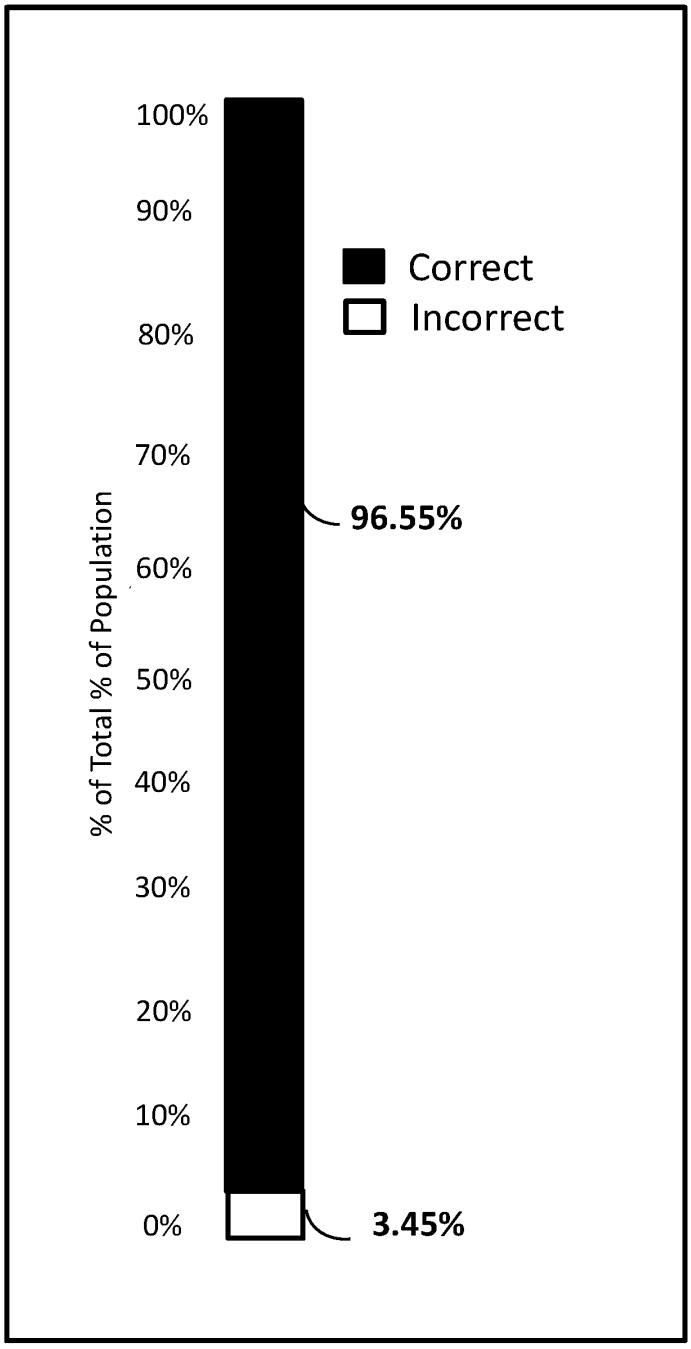

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
% of Total % of Population
Correct
Incorrect
96.55%
3.45%

FIG. 21D

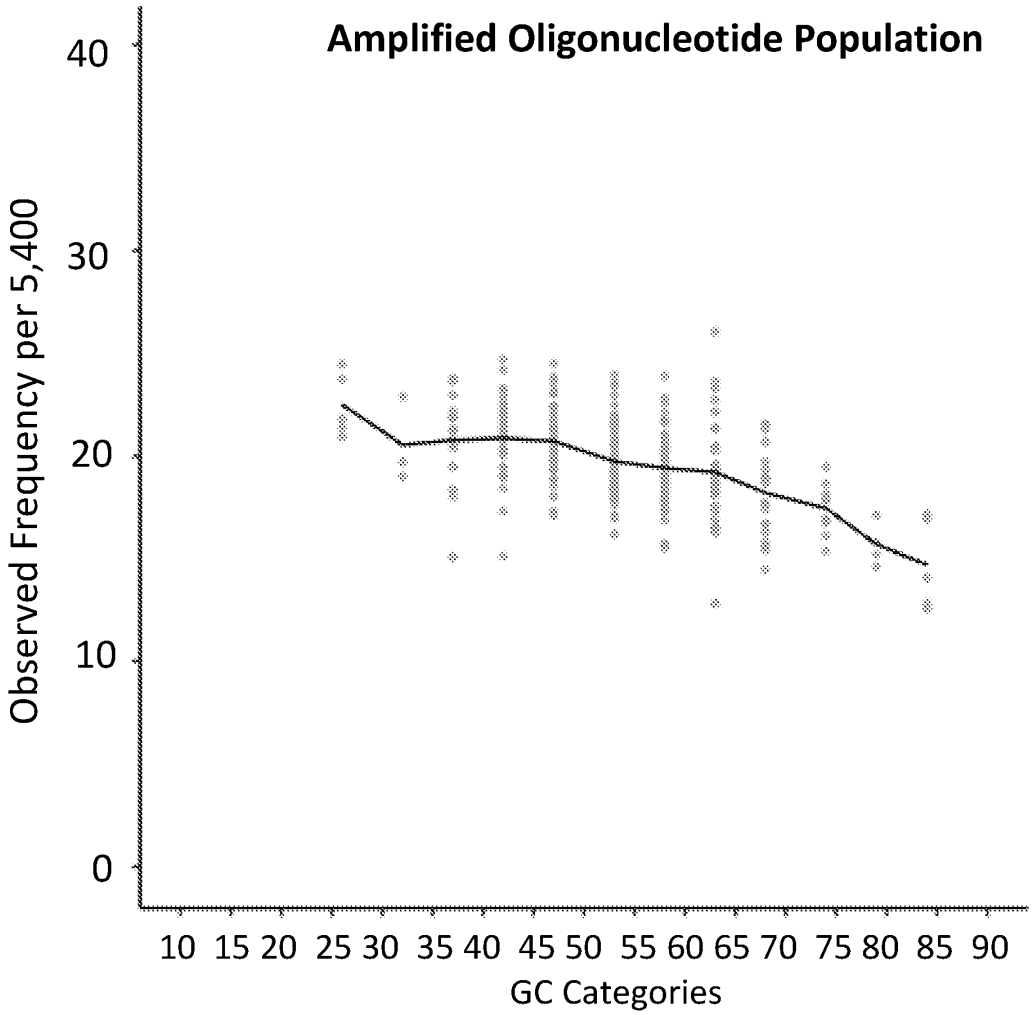

Amplified Oligonucleotide Population
Observed Frequency per 5,400
40
30
20
10
0
10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
GC Categories

FIG. 22A

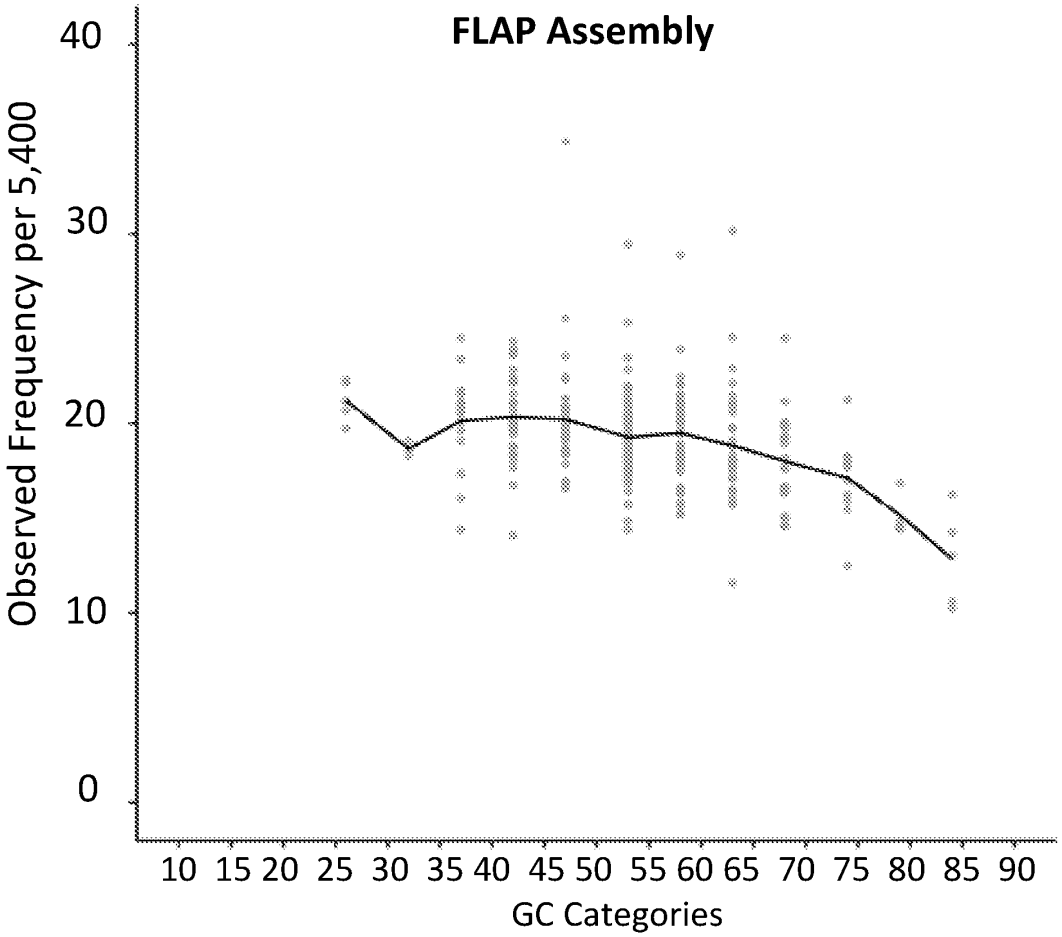

FLAP Assembly
Observed Frequency per 5,400
40
30
20
10
0
10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
GC Categories

FIG. 22B

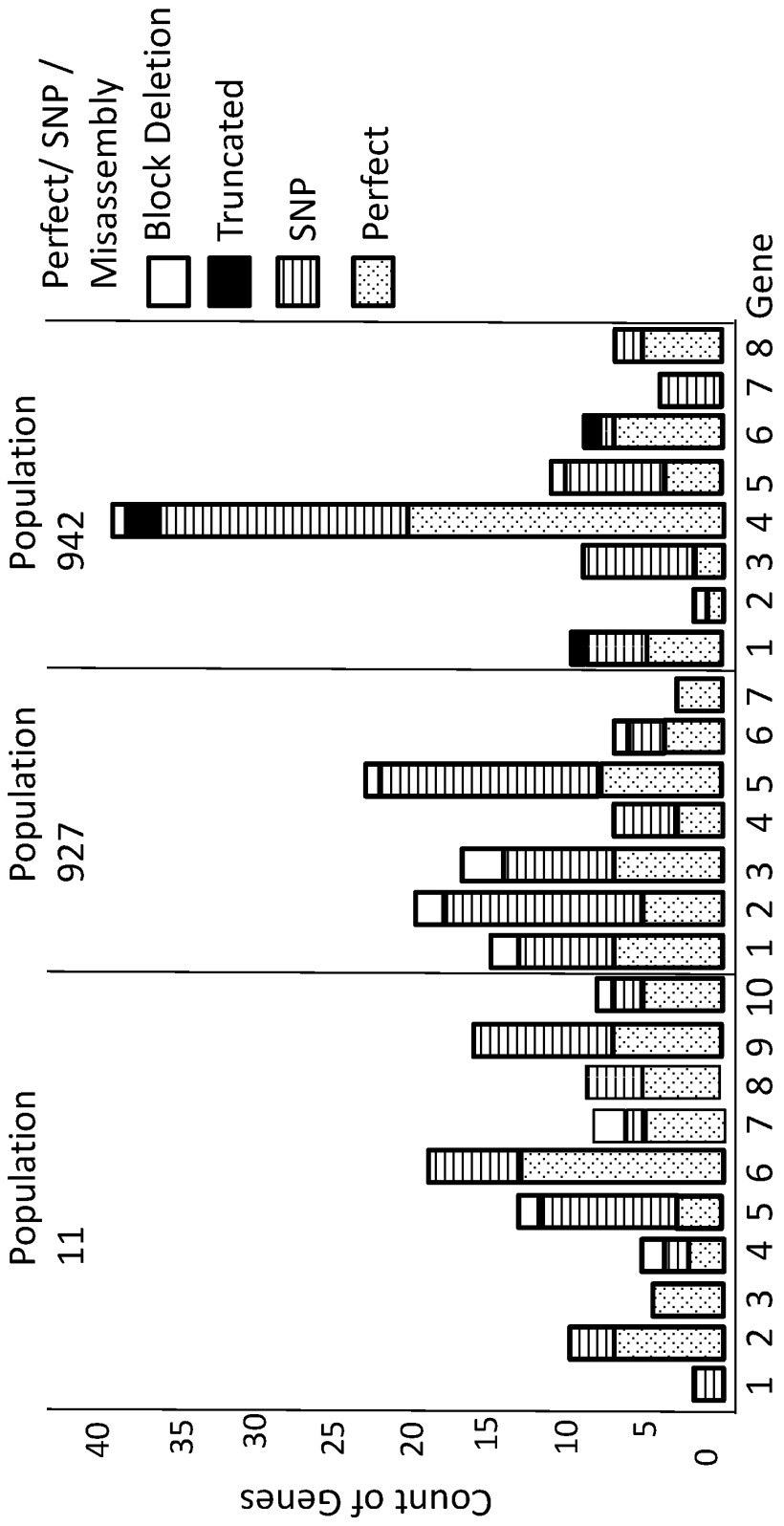

Perfect/ SNP / Misassembly
Block Deletion
Truncated
SNP
Perfect
Count of Genes
0
5
10
15
20
25
30
35
40
Population 11
Population 927
Population 942
1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 1 2 3 4 5 6 7 8
Gene

FIG. 23