

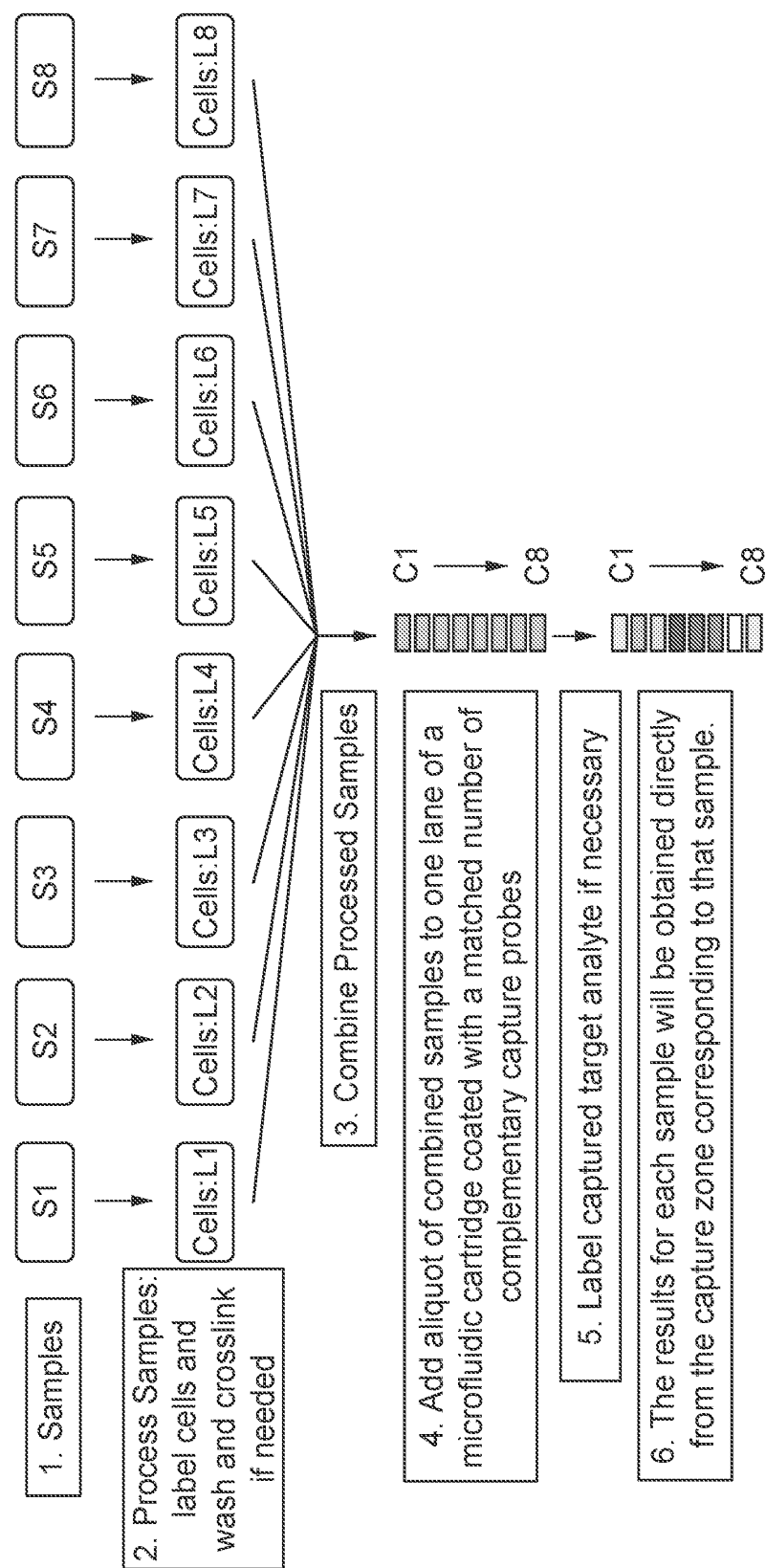
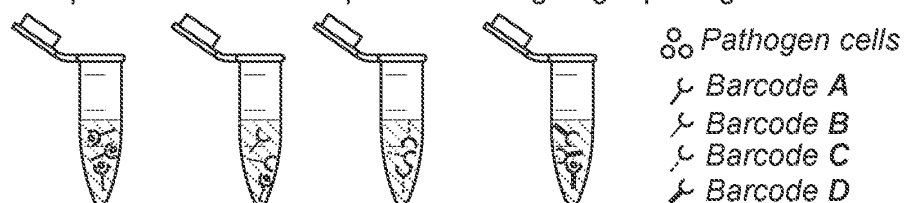


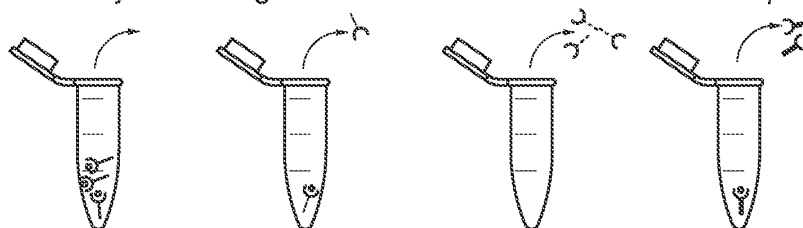
FIG. 1

1. Add unique barcodes to samples containing target pathogen cells:

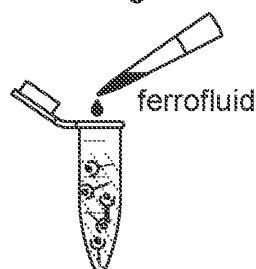


NOT to scale:

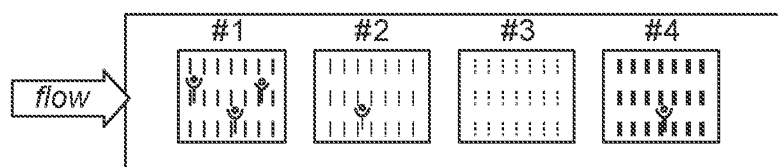
2. Wash off any remaining free label from the cell-barcode complexes:



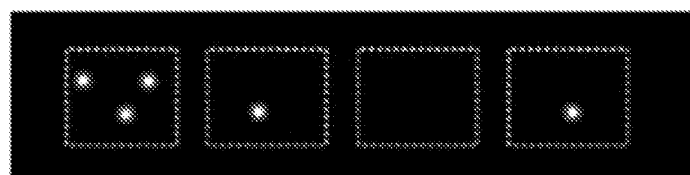
3. Pool all cell-barcode complexes and mix them with ferrofluid:



4. Guided by the barcodes, cells are captured at spatially separate zones within the microfluidic channel:



5. Fluorescent tagging of the cells & image collection:



6. Image processing and cell count at each capture zone and matching to the original sample:

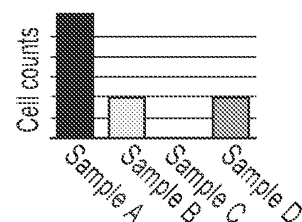


FIG. 2

A

Capture zones:

	#2	#3	#4
Barcode B	19,264	11	3
Barcode C	10	15,431	5
Barcode D	9	3	20,644

B

Capture zones:

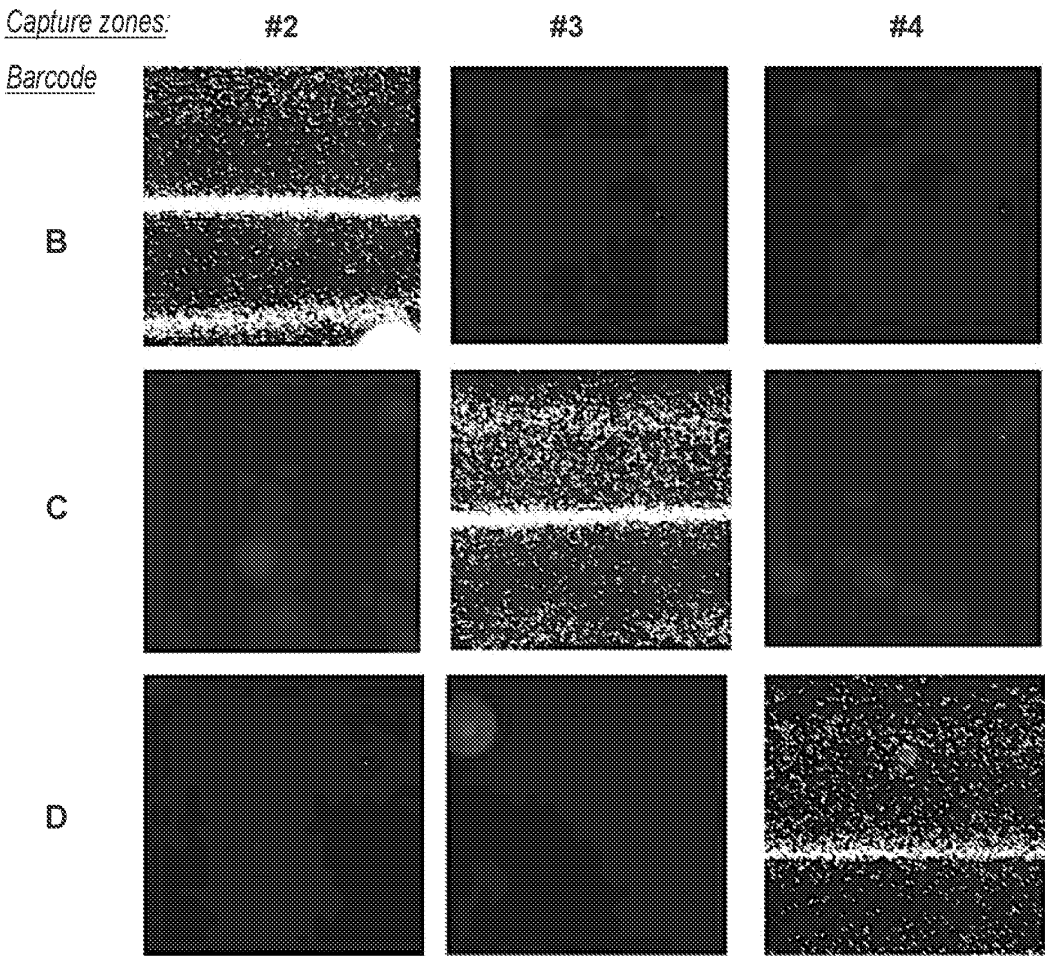
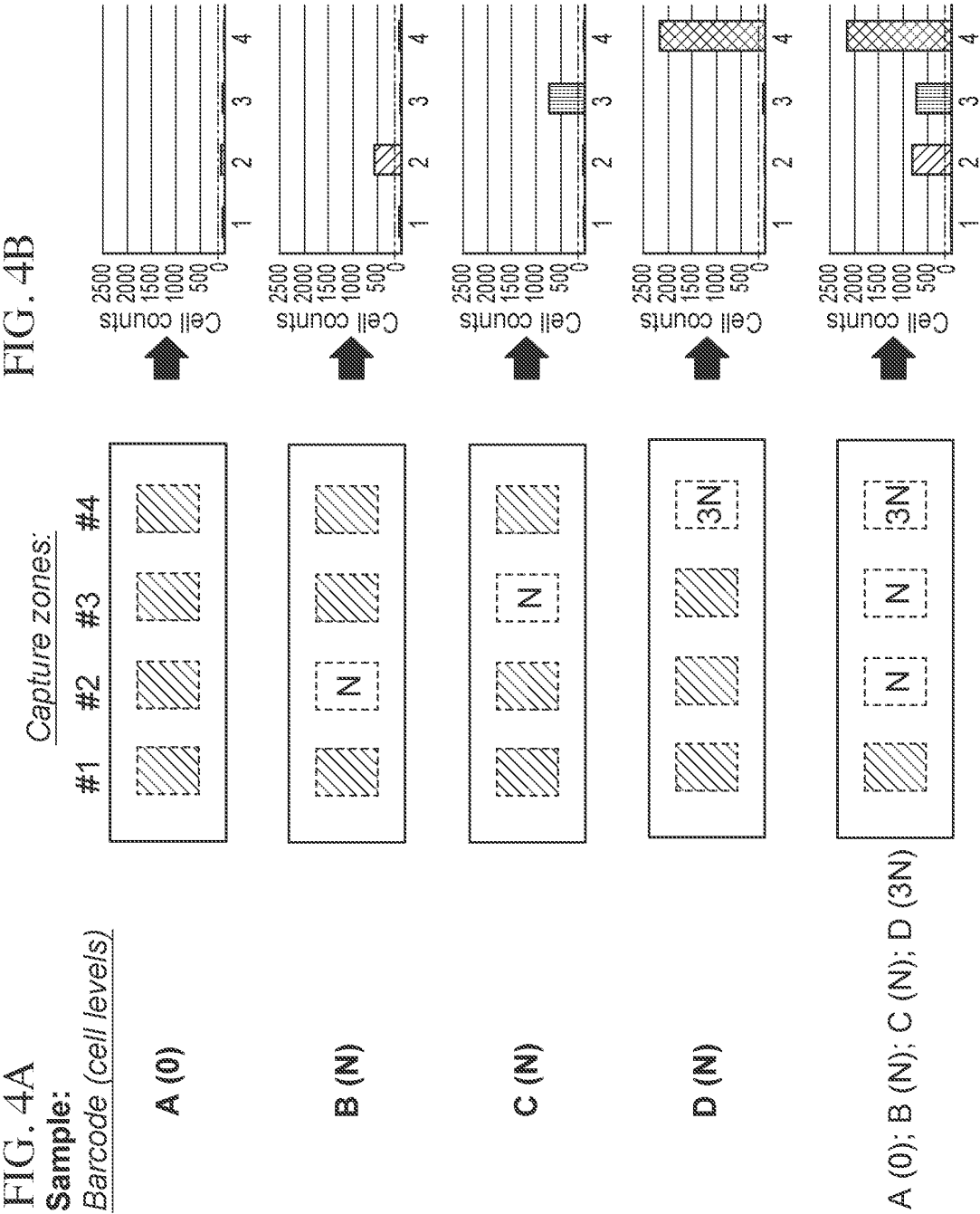


FIG. 3



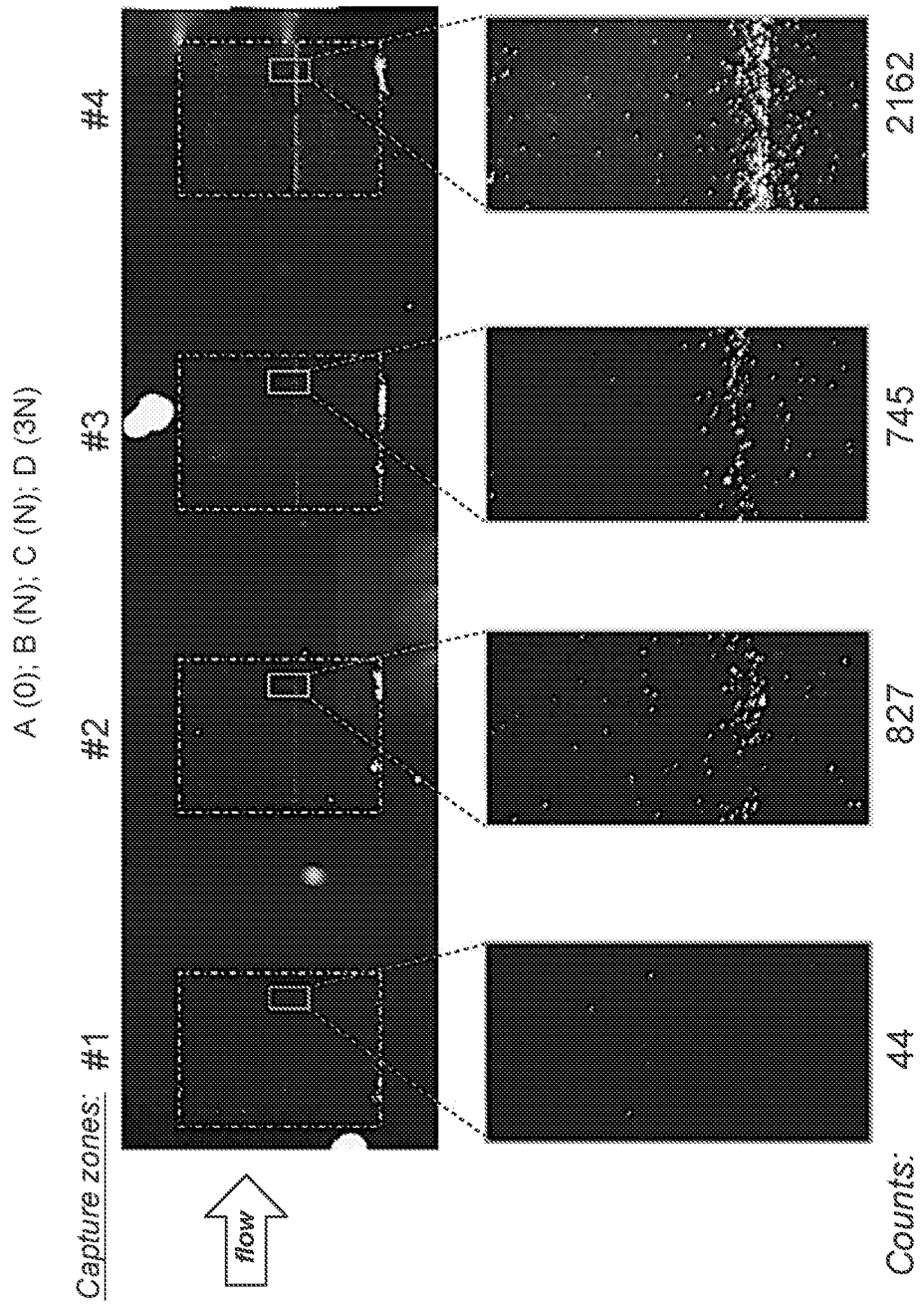
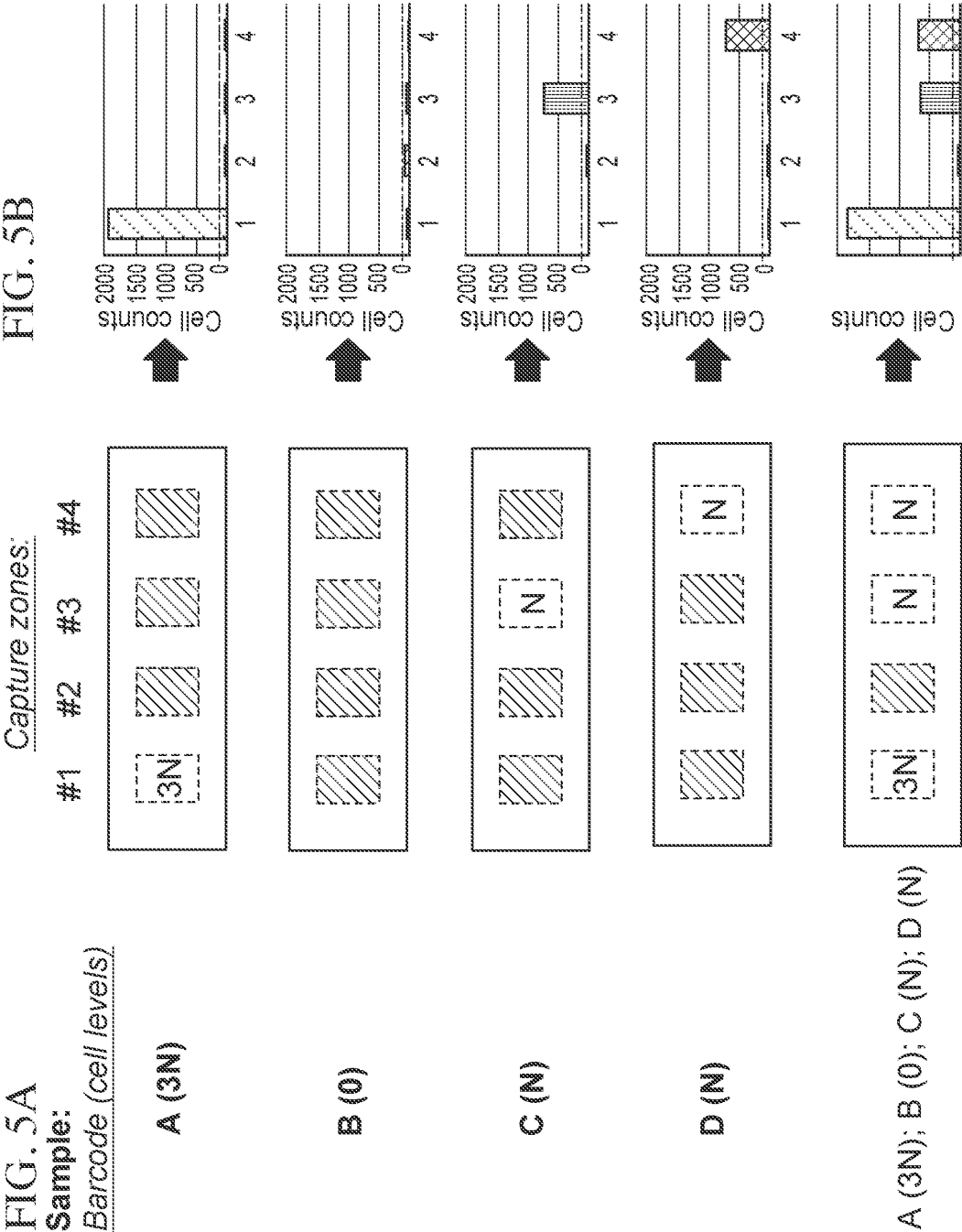


FIG. 4C



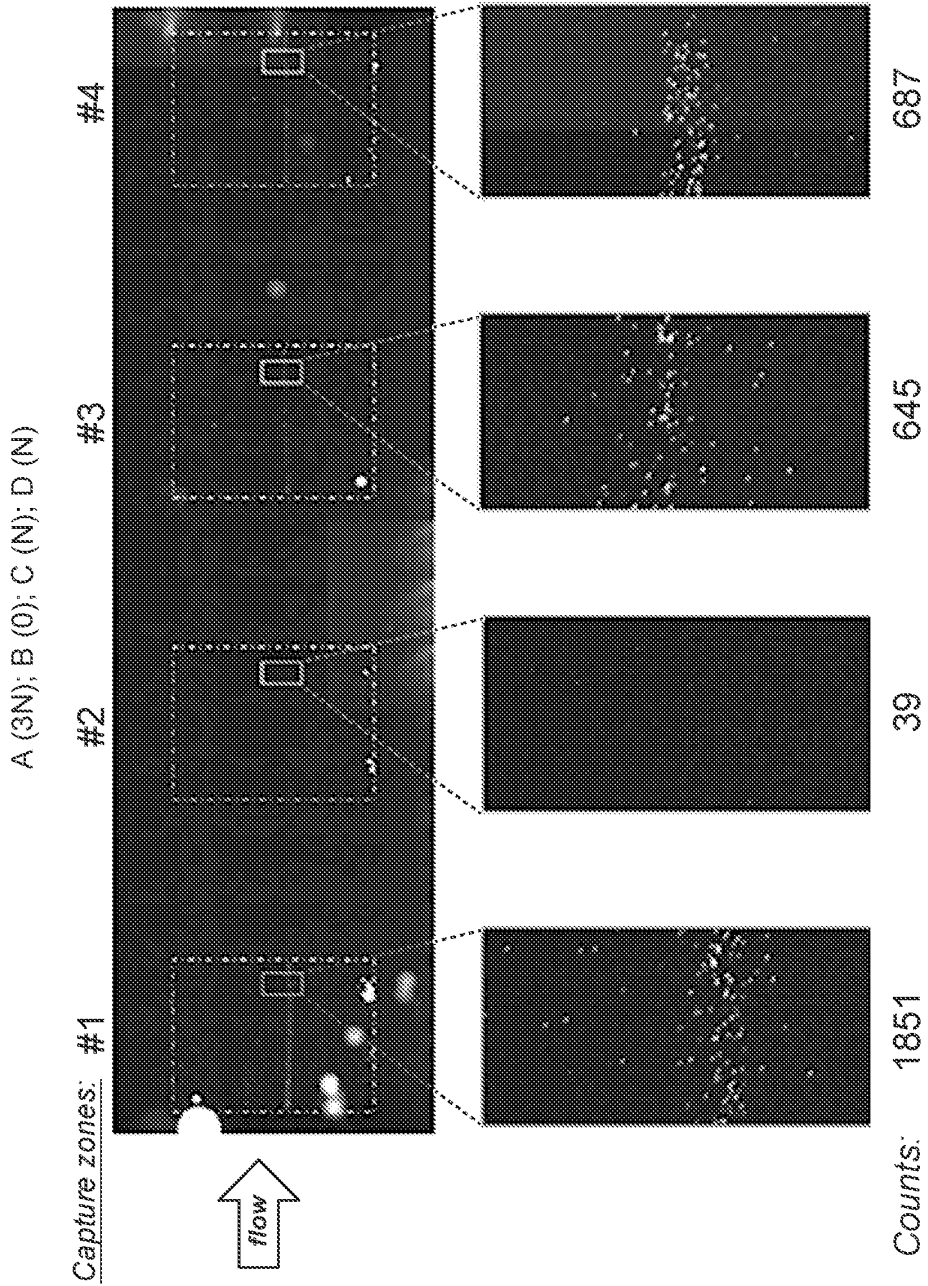


FIG. 5C

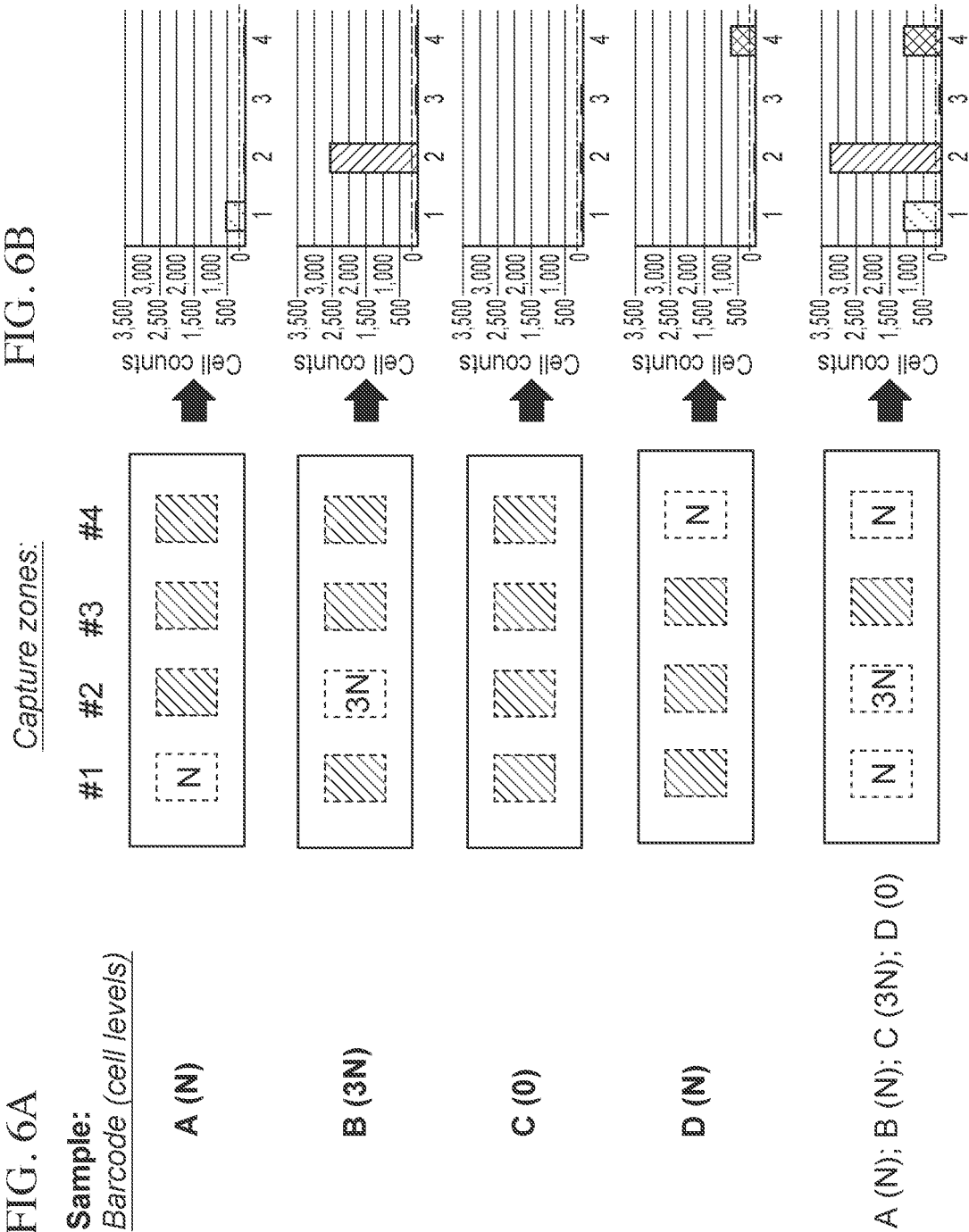


FIG. 6B

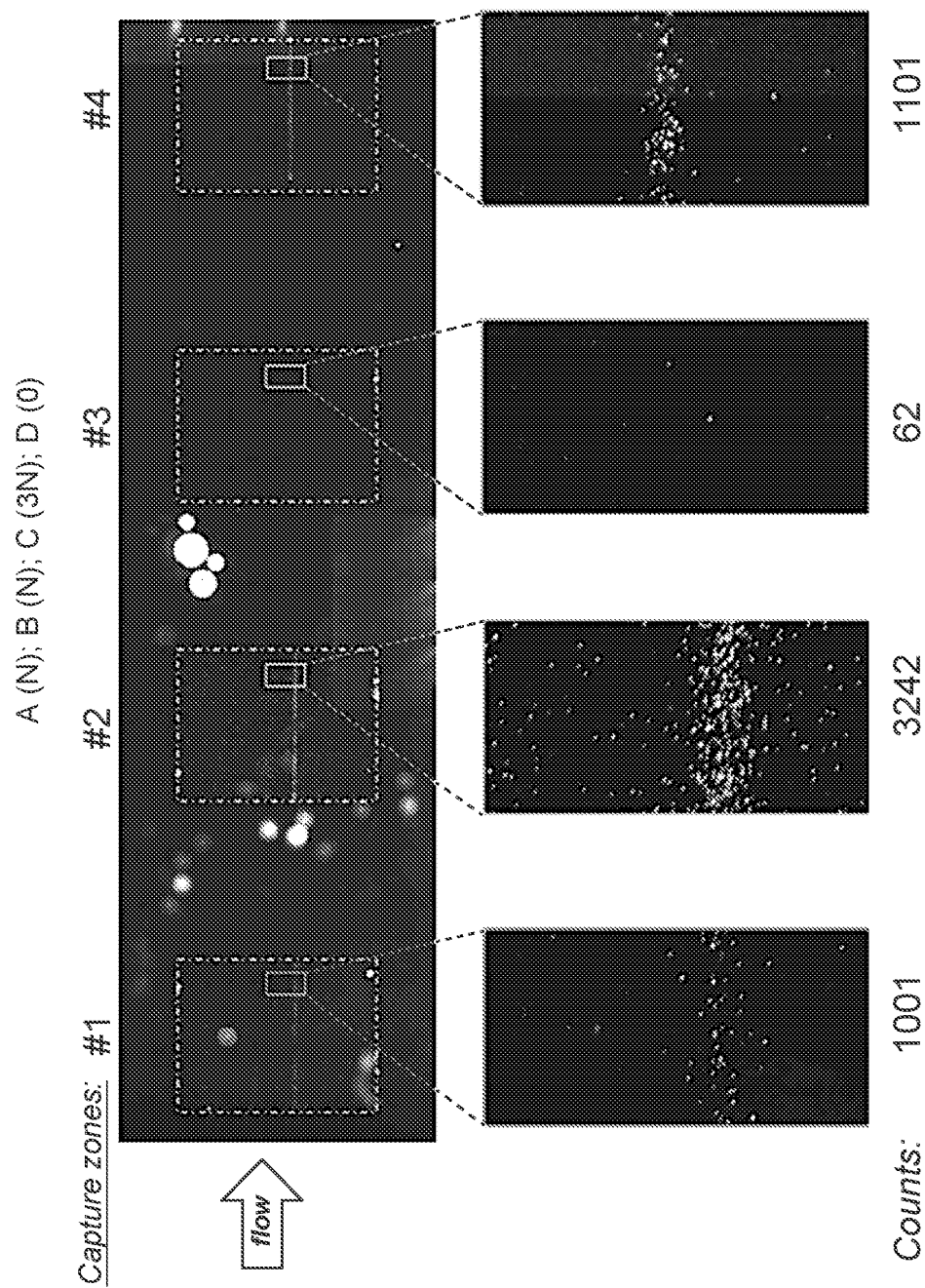


FIG. 6C

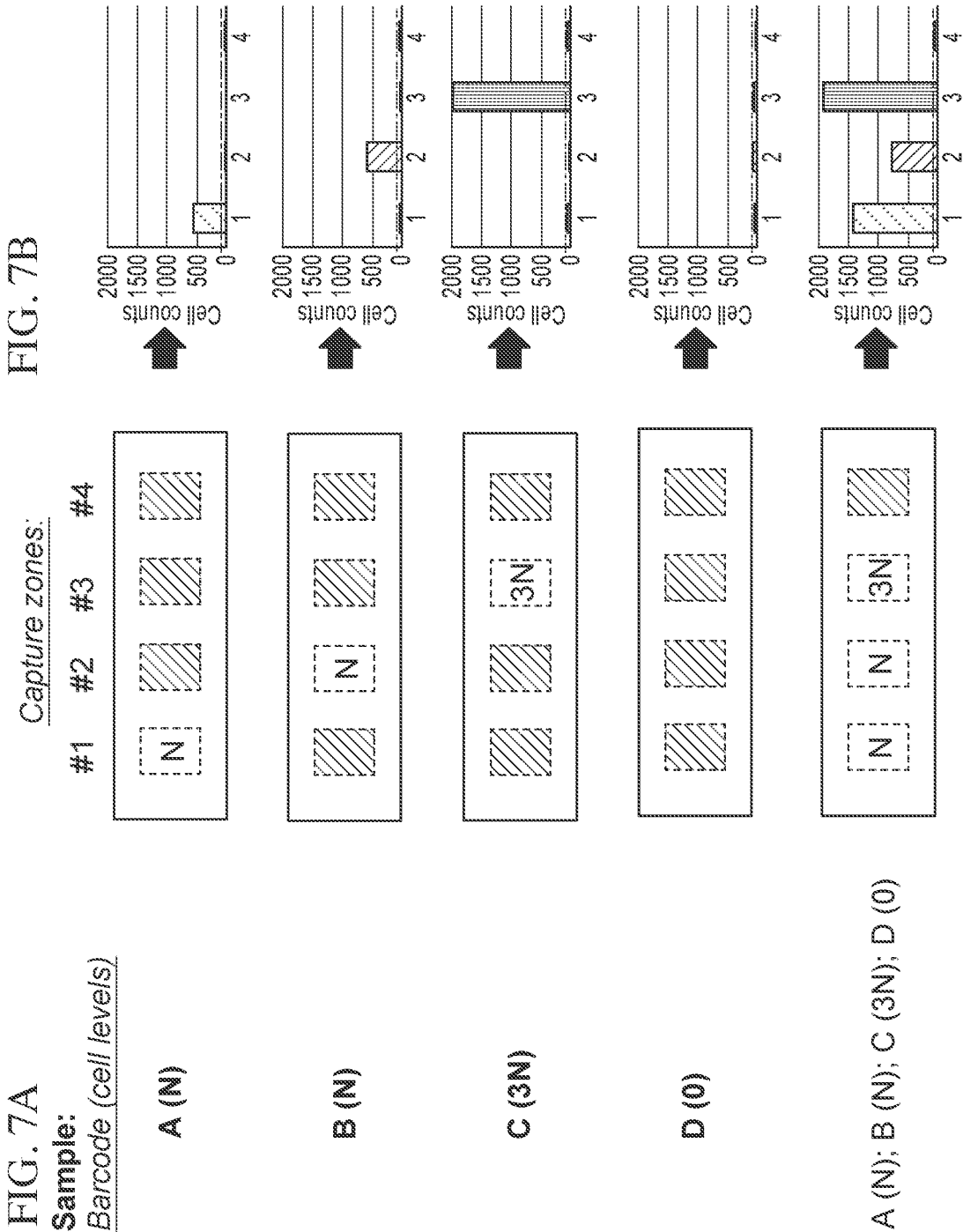


FIG. 7B

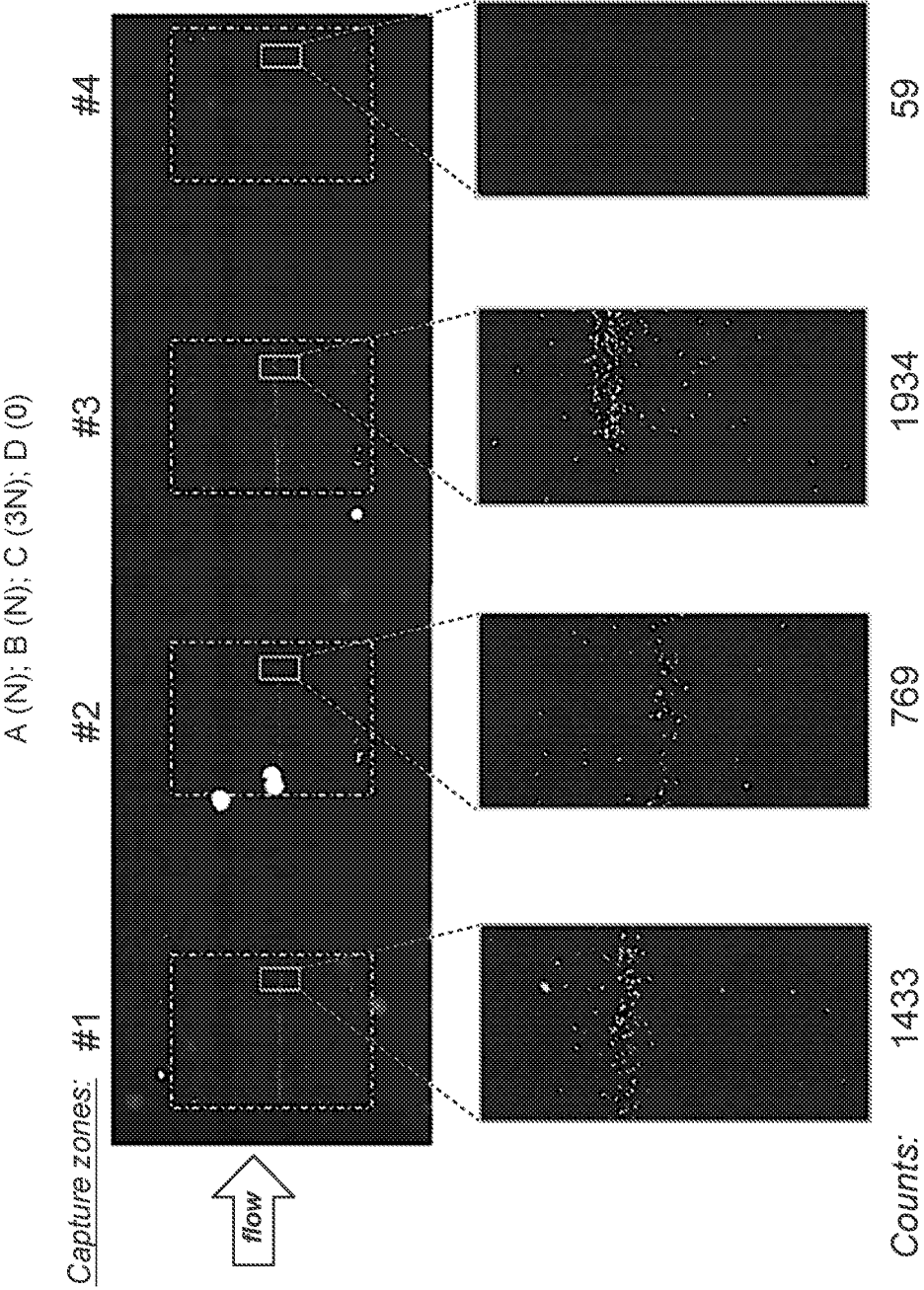
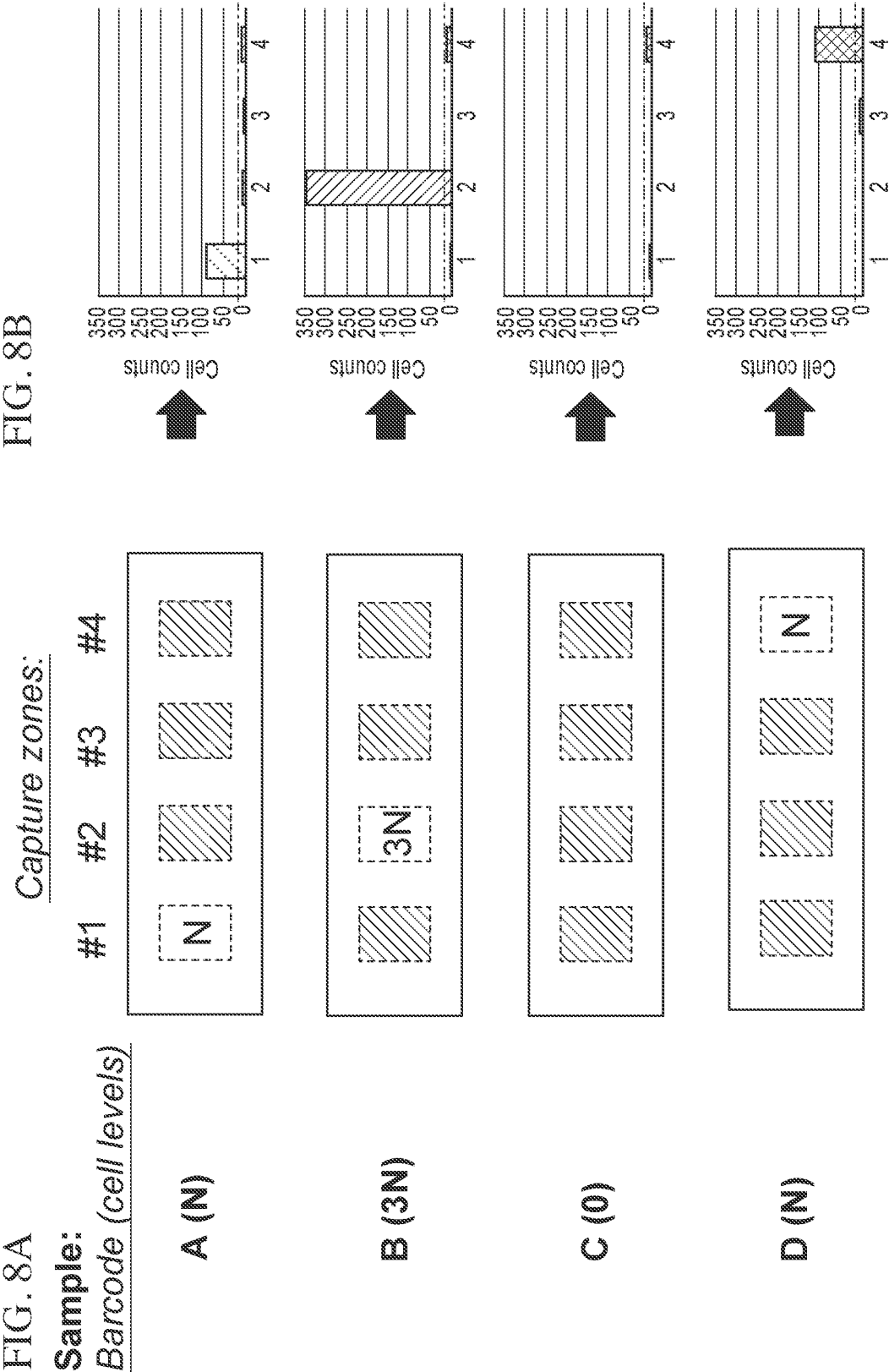


FIG. 7C



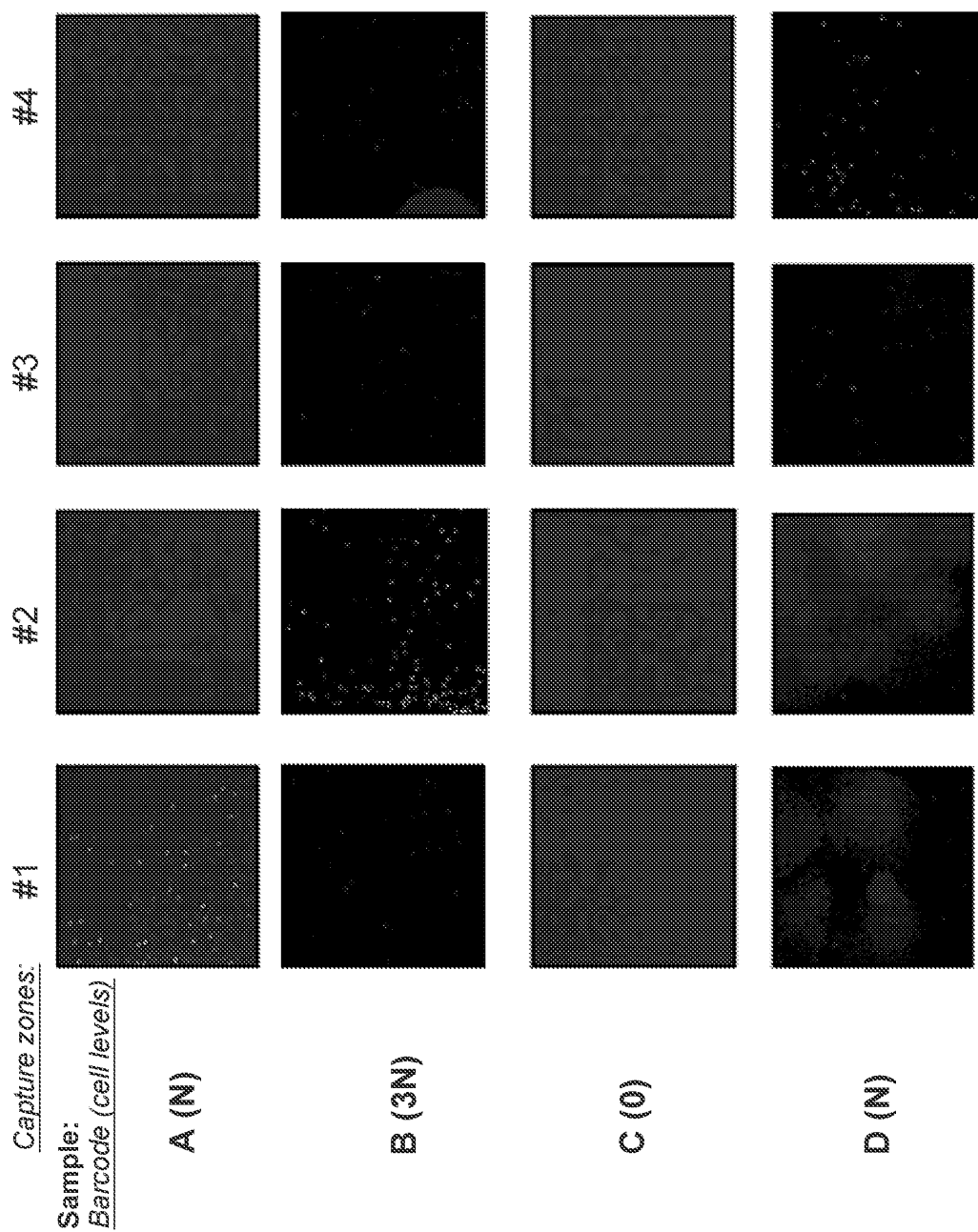


FIG. 8C

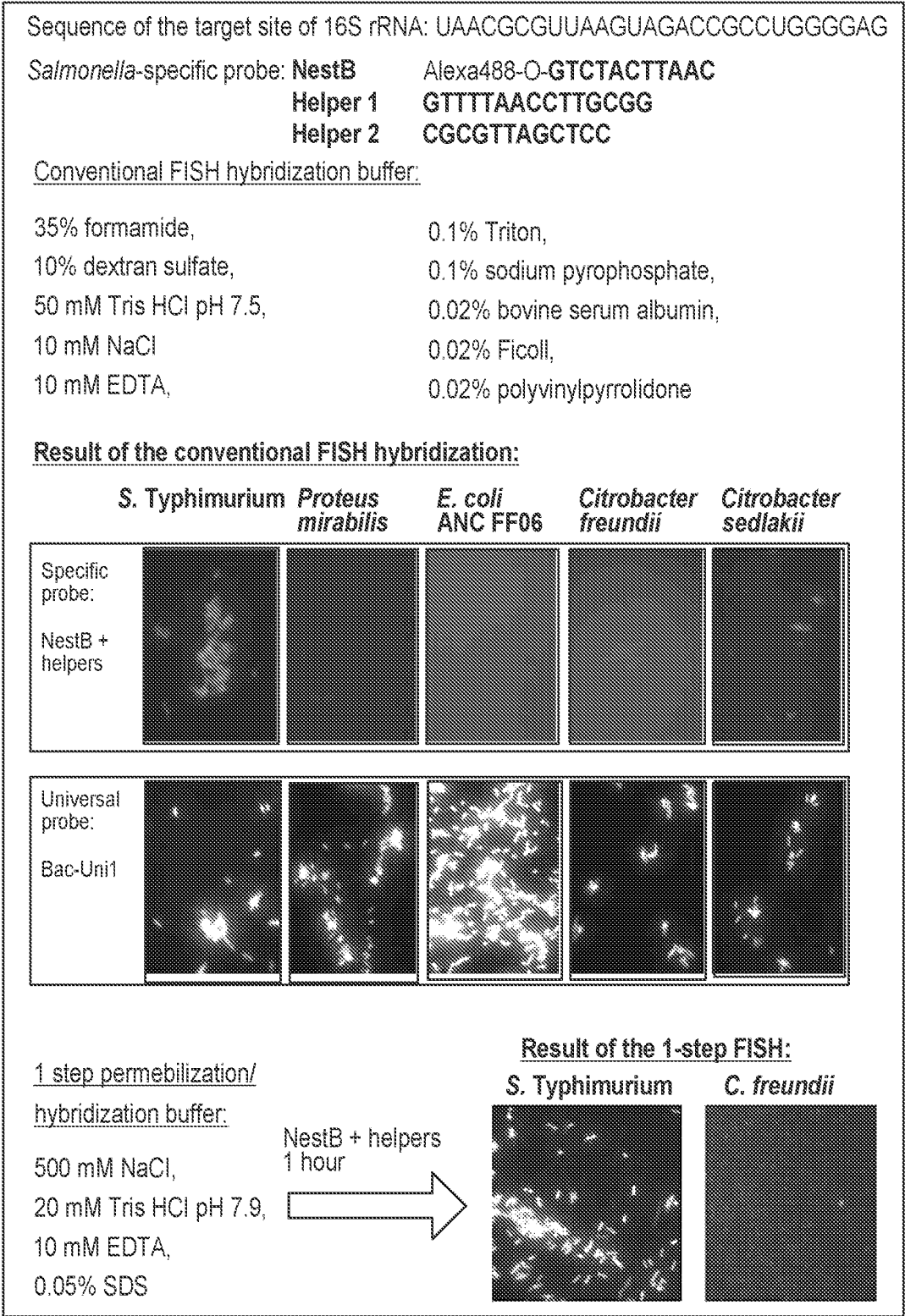


FIG. 9A

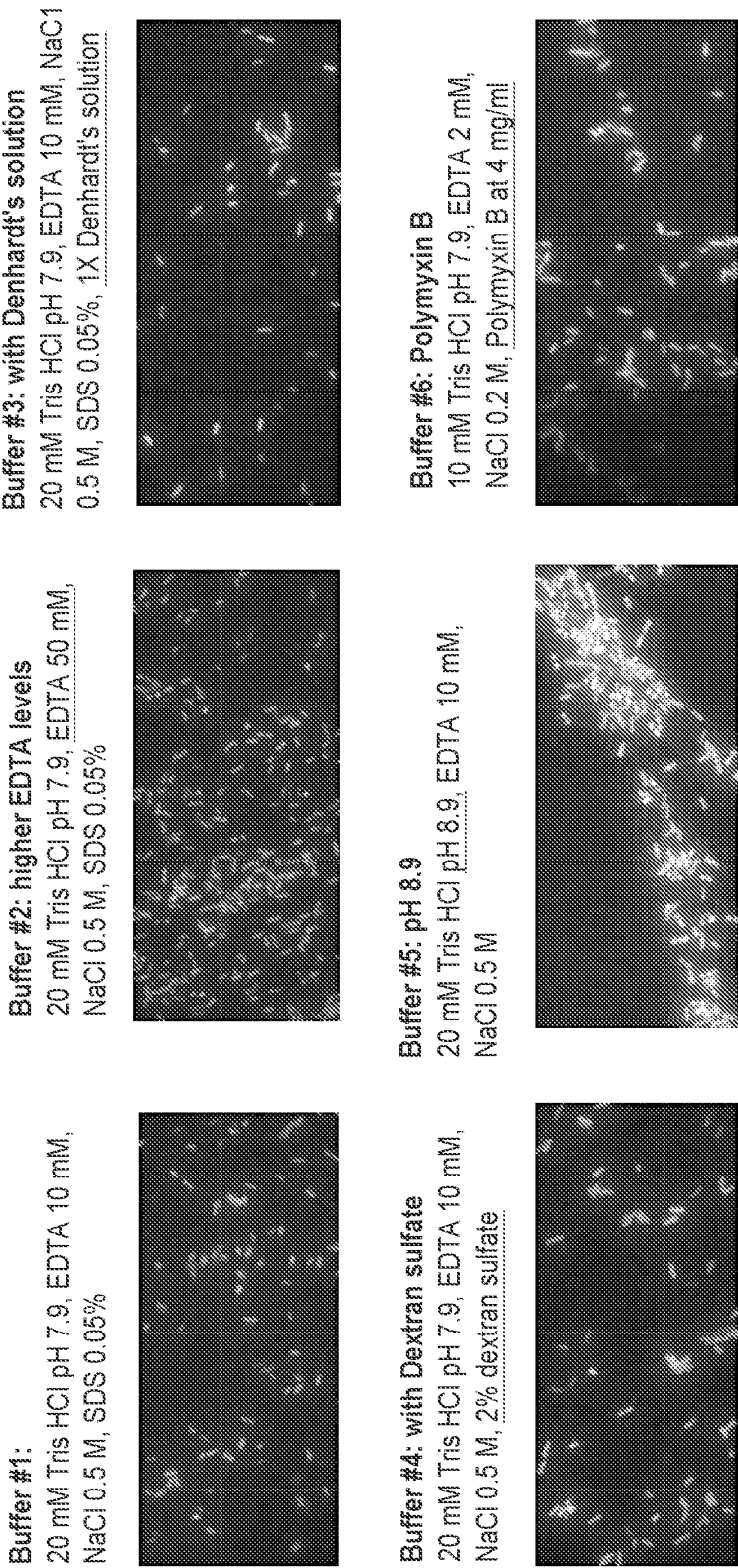


FIG. 9B

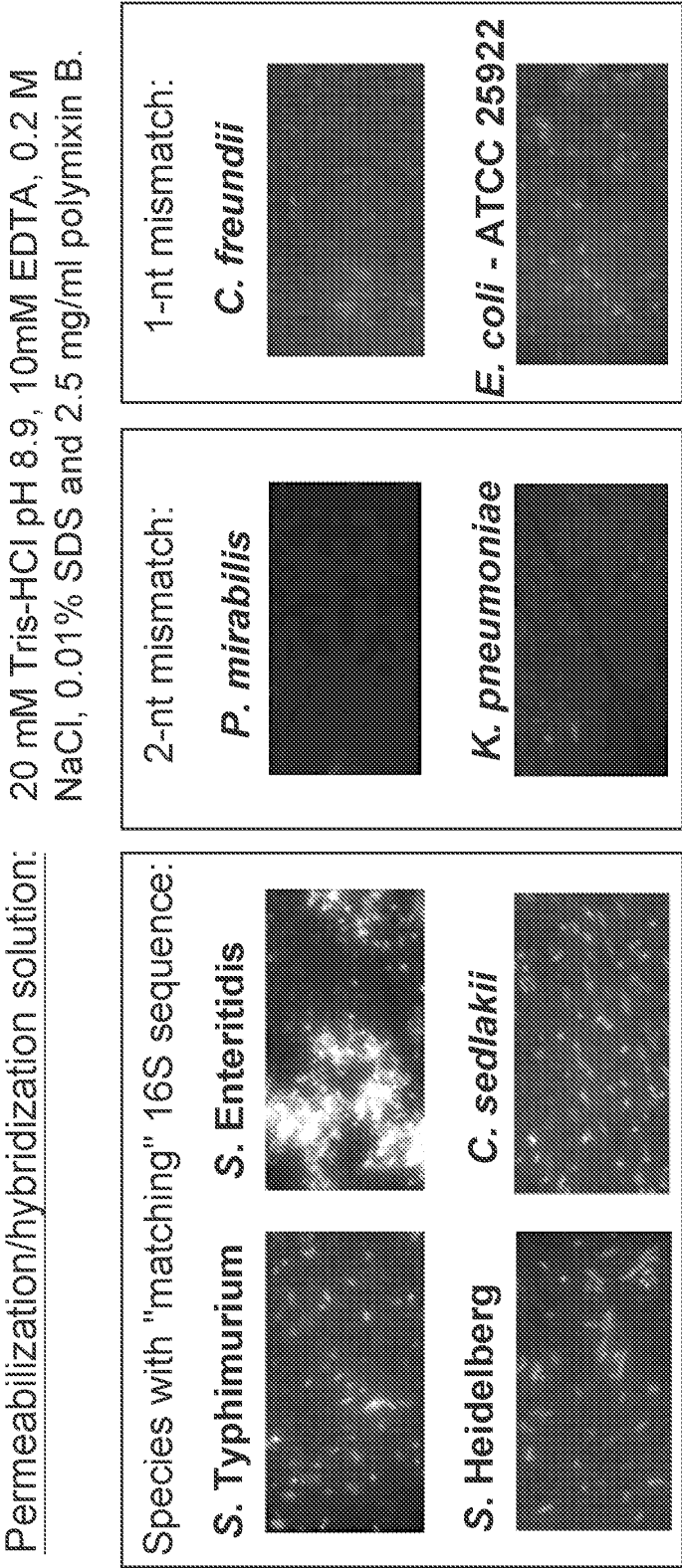


FIG. 9C

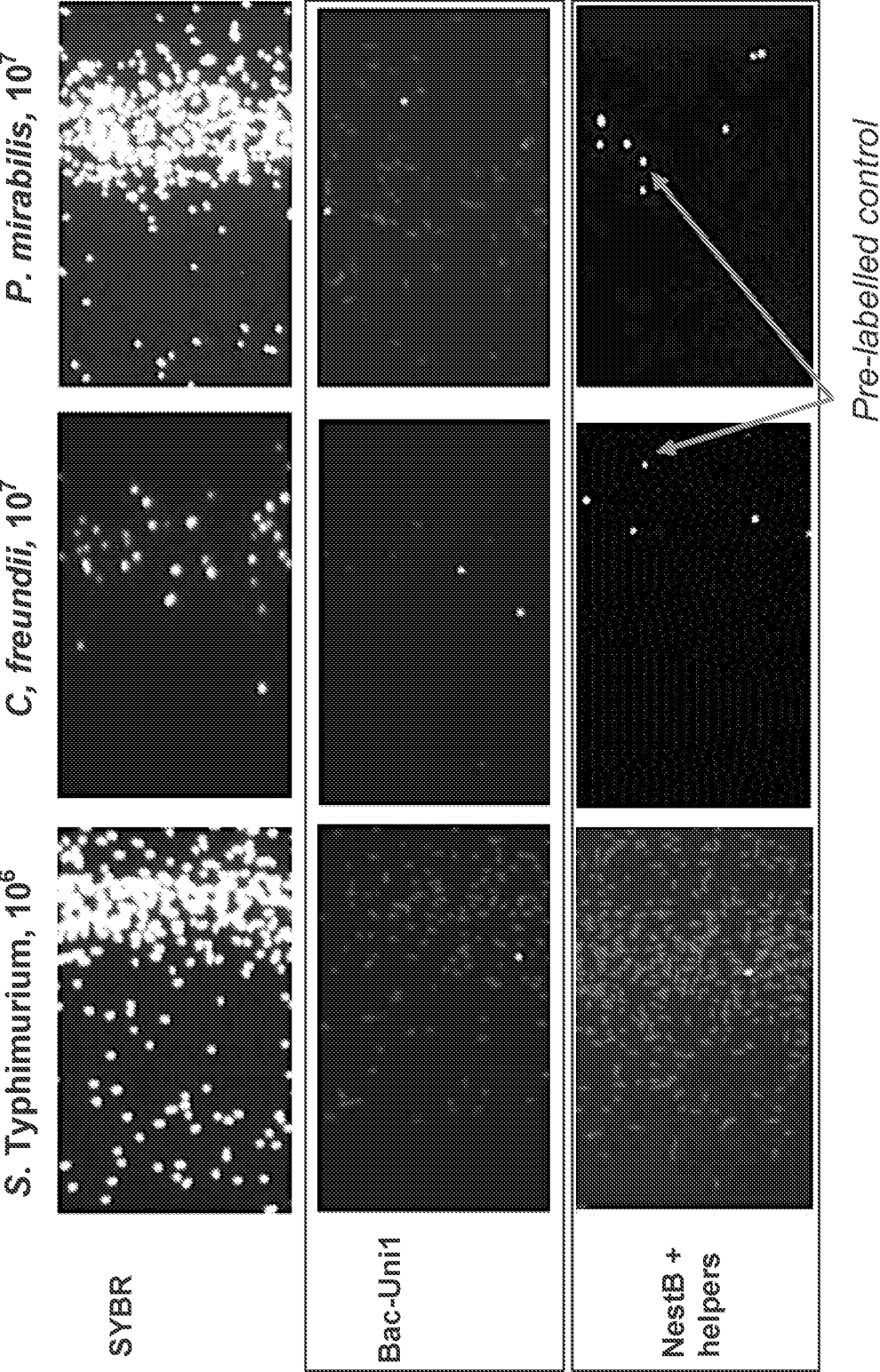


FIG. 10

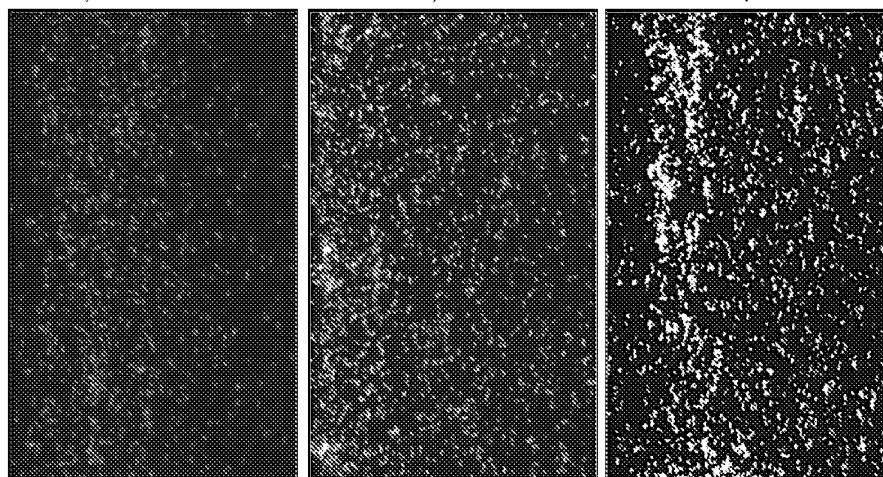
Compare - *Salmonella Typhimurium**Ancera Confidential*NestF, helpers 1+2
3617, lane 1Bac-Uni1:
3562, lane 1SYBR:
3624, lane 1

FIG. 11A

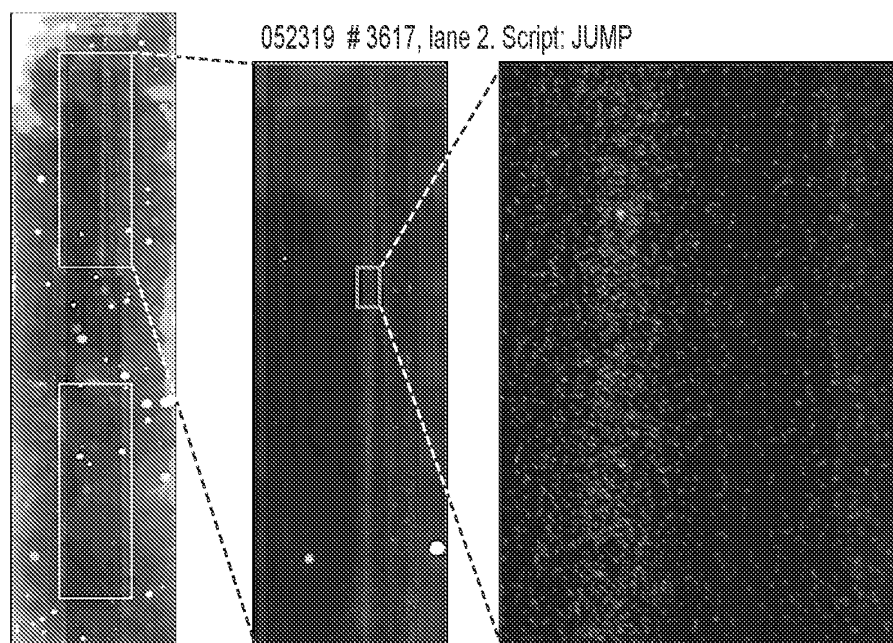
NestF, helpers 1,2 - *Salmonella Arizonae*

FIG. 11B

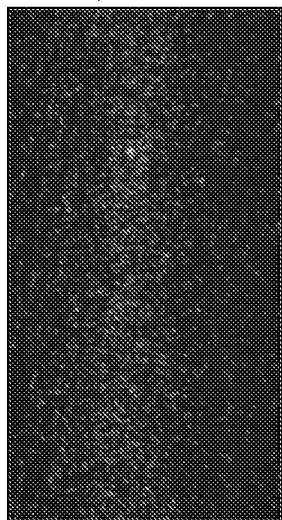
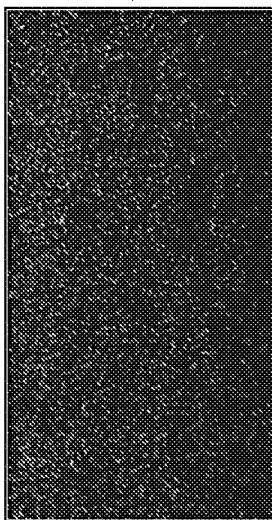
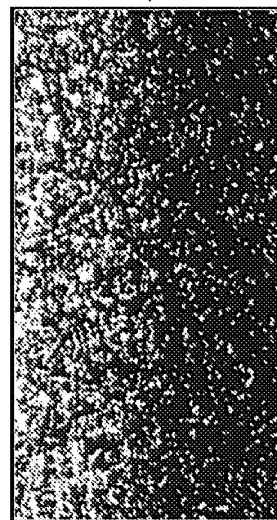
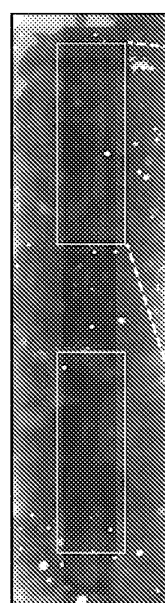
Compare - *Salmonella* Arizonae*Ancera Confidential*NestF, helpers 1+2
3617, lane 2Bac-Uni1:
3562, lane 2SYBR:
3624, lane 3

FIG. 11C

NestF, helpers 1,2 - *Salmonella* Newport*Ancera Confidential*

052319 # 3617, lane 3. Script: JUMP

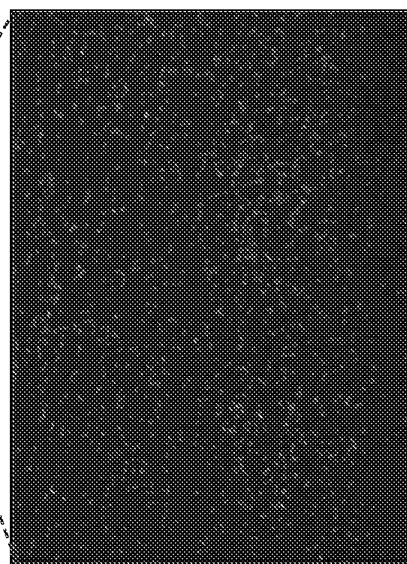
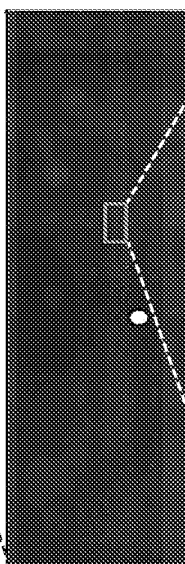
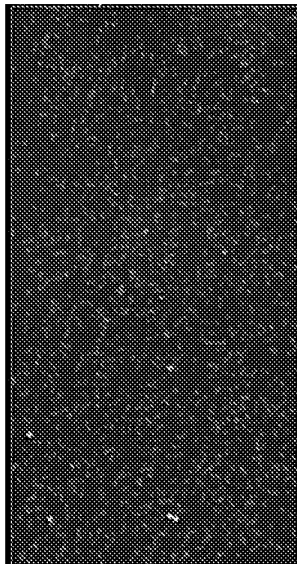


FIG. 11D

Compare - *Salmonella* Newport

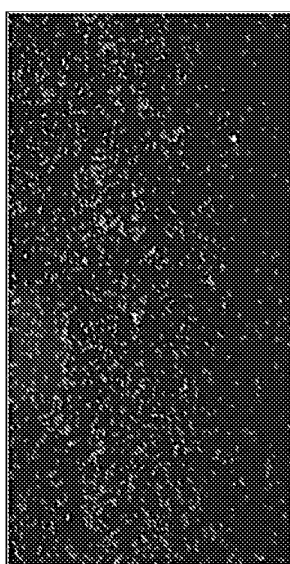
NestF, helpers 1+2

3617, lane 3



Bac-Uni1:

3562, lane 3



Ancera Confidential

SYBR:

3624, lane 3

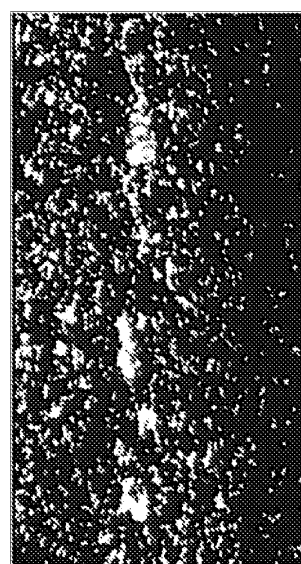


FIG. 11E

NestF, helpers 1,2 - *Salmonella* Muenchen

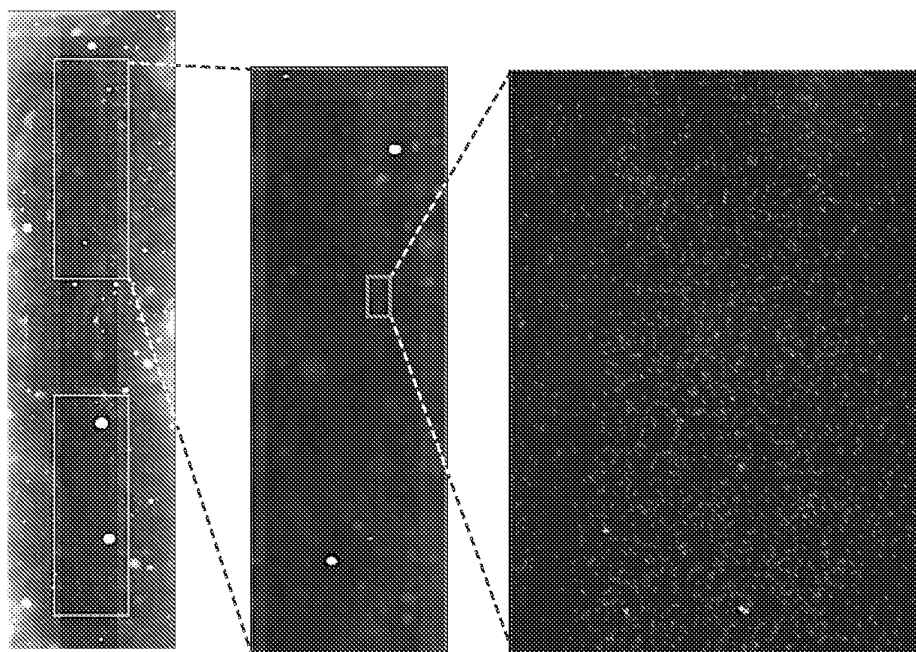


FIG. 11F

Compare - *Salmonella Muenchen*

Ancera Confidential

NestF, helpers 1+2
3617, lane 4

Bac-Uni1:
3562, lane 4

SYBR:
3624, lane 4

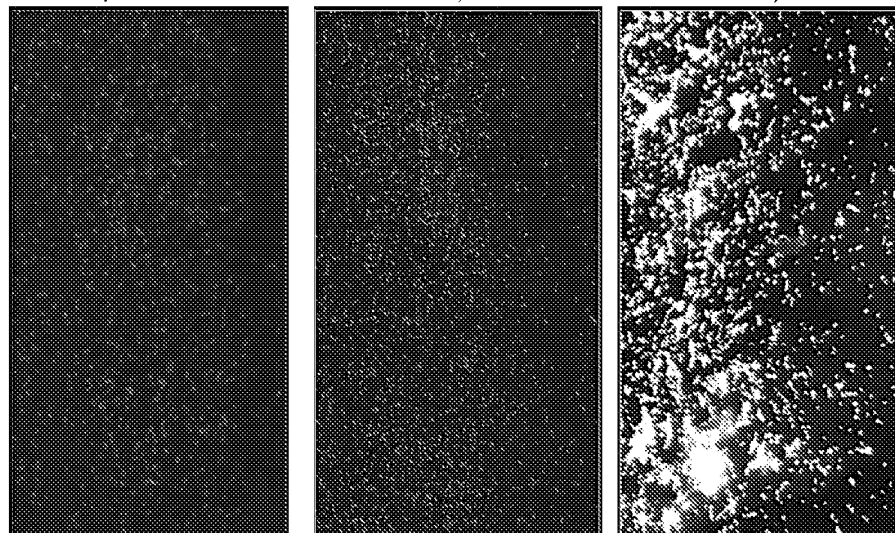


FIG. 11G

Compare - *Citrobacter freundii*

Ancera Confidential

NestF, helpers 1+2
3617, lane 7

Bac-Uni1:
3562, lane 7

SYBR:
3624, lane 7

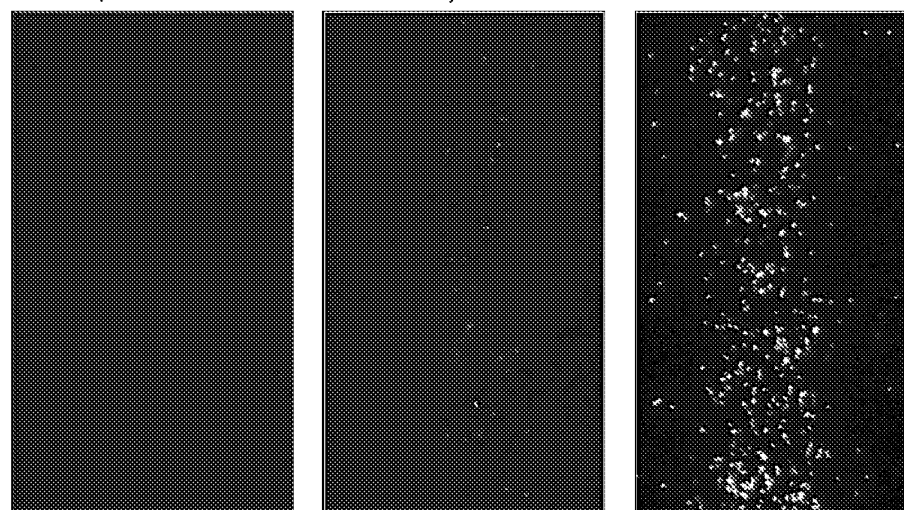
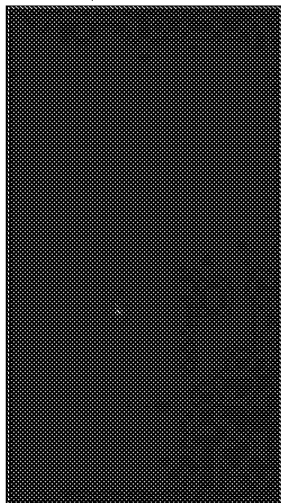


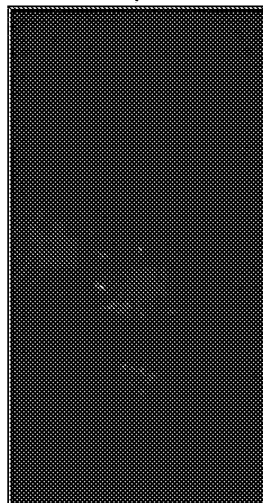
FIG. 11H

Compare - *E.coli*

NestF, helpers 1+2
3617, lane 8



Bac-Uni1:
3562, lane 8



Ancera Confidential

SYBR:
3624, lane 8

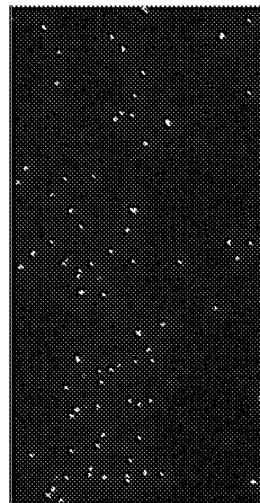
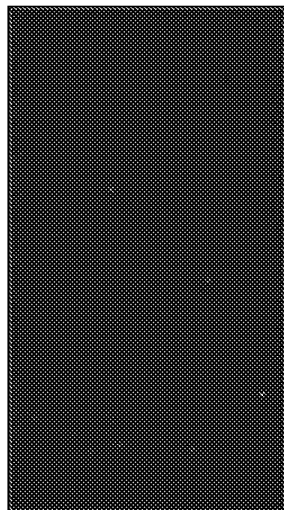


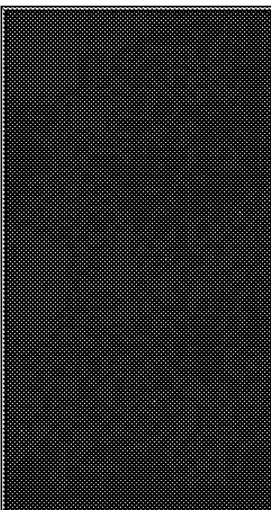
FIG. 11I

Compare - *Proteus mirabilis*

NestF, helpers 1+2
3617, lane 9



Bac-Uni1:
3562, lane 9



Ancera Confidential

SYBR:
3624, lane 9

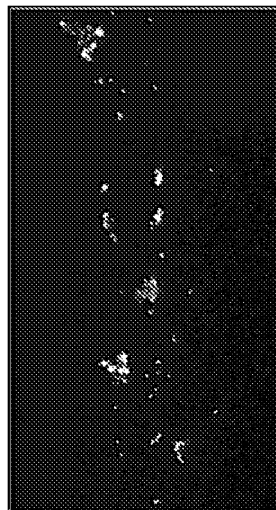


FIG. 11J

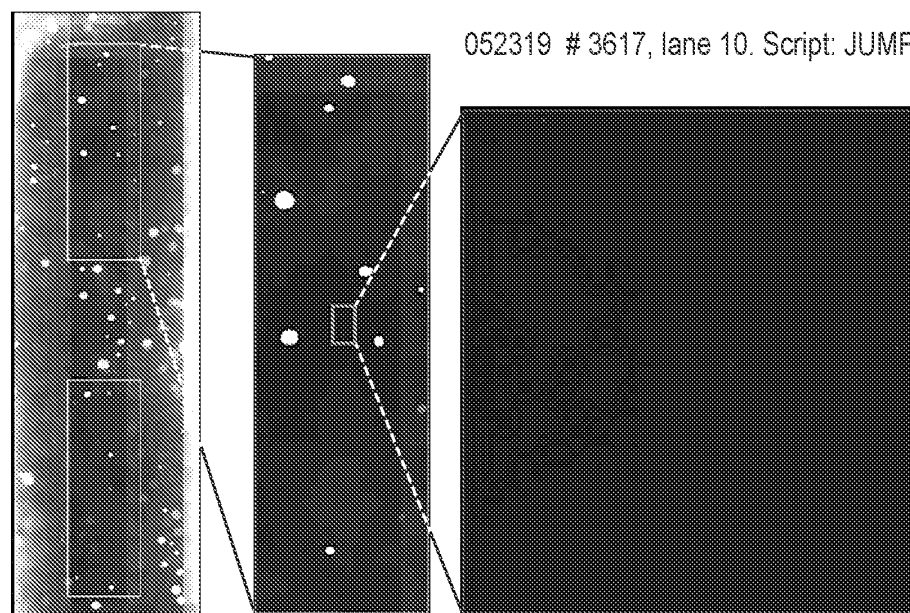
NestF, helpers1,2 - *Klebsiella pneumoniae* *Ancera Confidential*

FIG. 11K

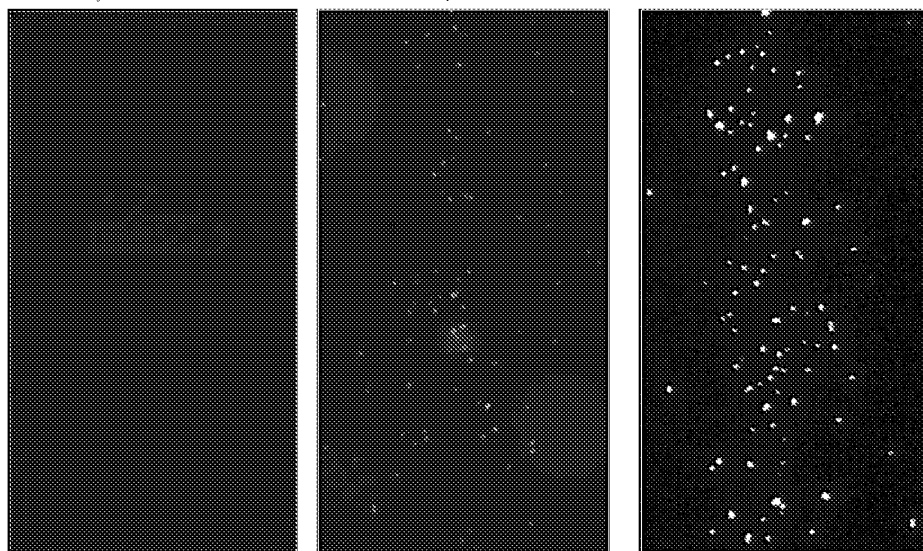
Compare: *Enterobacter cancerogenus**Ancera Confidential***NestF, helpers 1+2**
3617, lane 11**Bac-Uni1:**
3562, lane 11**SYBR:**
3624, lane 11

FIG. 11L

Compare: *Shigella sonnei**Ancera Confidential*

NestF, helpers 1+2

Bac-Uni1:

SYBR:

3617, lane 12

3562, lane 12

3624, lane 12

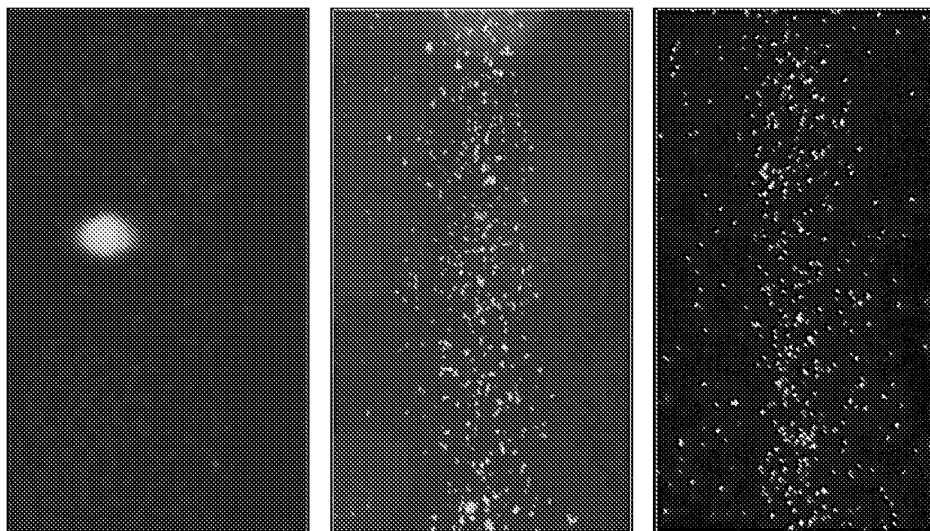
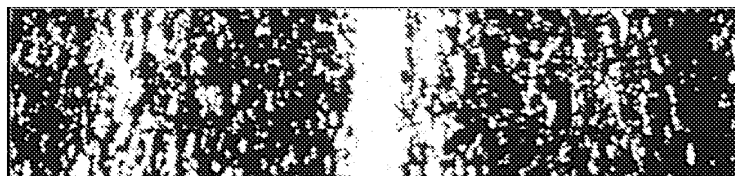


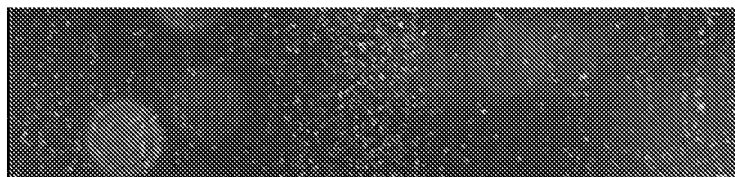
FIG. 11M

***Staphylococcus saprophyticus* ATCC 15305**

SYBR



Bac-Uni1



NestF

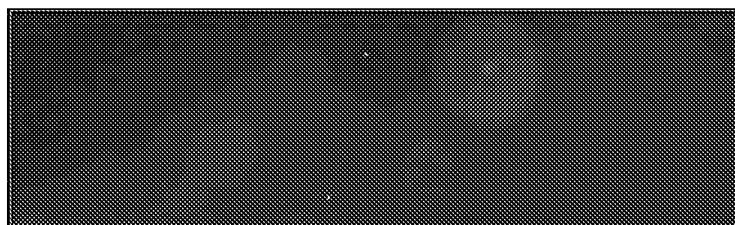
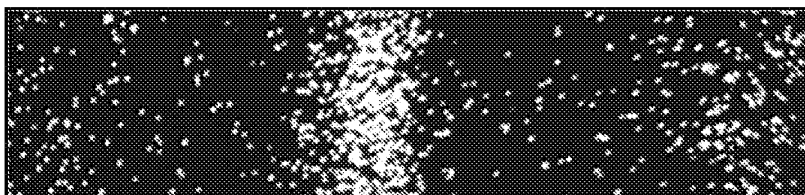


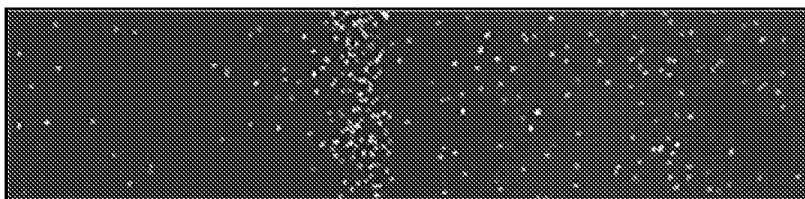
FIG. 11N

Pseudomonas gragi QL 17041-14

SYBR



Bac-Uni1



NestF

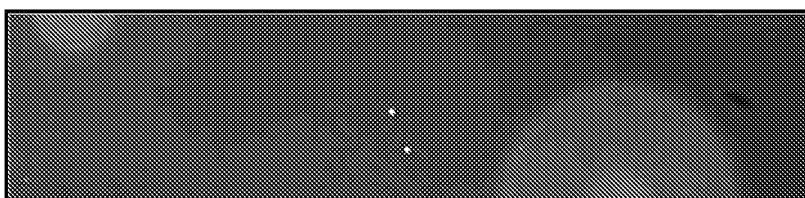


FIG. 11O

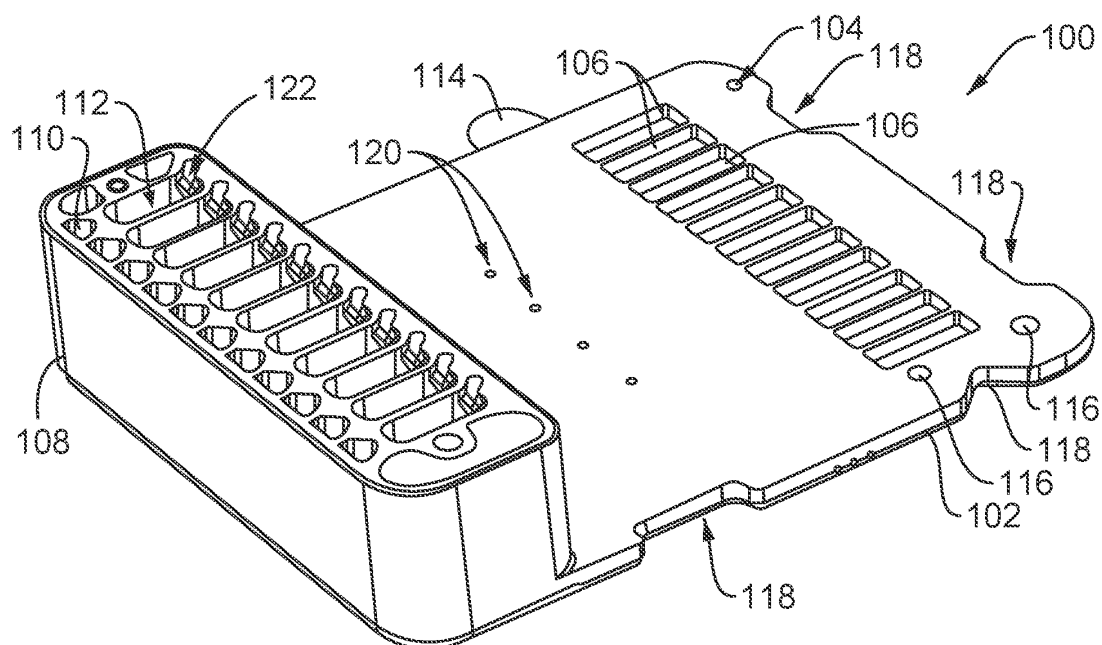


FIG. 12

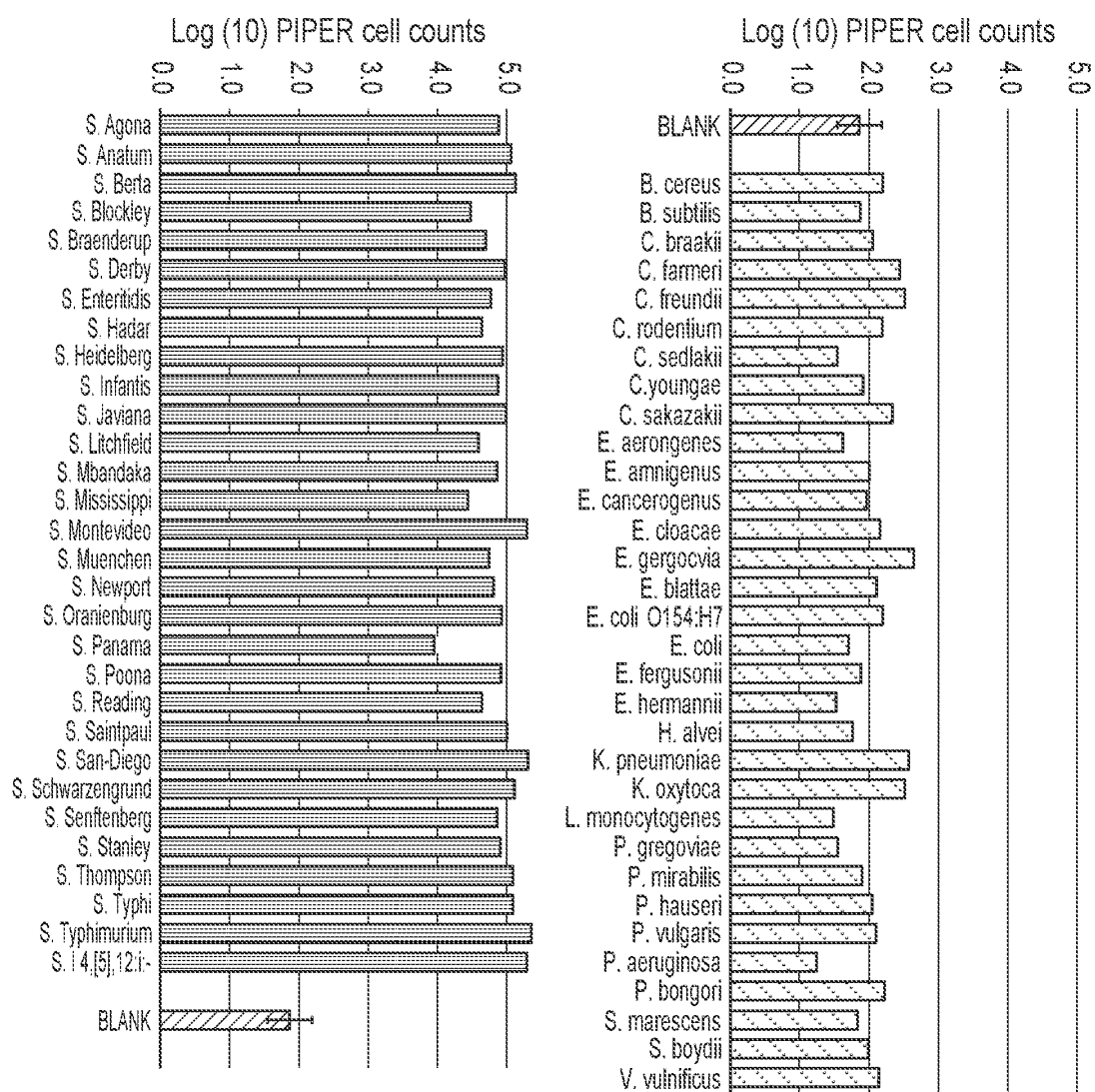


FIG. 13

Genus	Species	Subspecies	Serovar	Source	Reference No.
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Abaetetuba	ATCC	35640
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Abony	NCTC	6017
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Abortusequi	ATCC	9842
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Abortusovis	ATCC	31684
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Adelaide	UPENN	STS 2
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Adjame	NCTC	14248
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Agama	UPENN	STS 3
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Agona *	ATCC	51957
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Agoueve	UPENN	STS 5
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Alabama	NCTC	9868
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Alachua	UPENN	STS 6
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Albany	UPENN	STS 7
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Amherstiana	NCTC	6385
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Anatum *	ATCC	9270
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Arkansas	UPENN	STS 11
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Bareilly	UPENN	STS 12
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Berta *	UPENN	STS 13
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Binza	UPENN	STS 14
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Bovis-morbificans	UPENN	STS 16
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Blockley *	NCTC	9926
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Brandenburg	UPENN	STS 18
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Braenderup *	NCTC	5750
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Bredeney	NCTC	5731
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	California	NCTC	6018
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Cerro	UPENN	STS 22
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Choleraesuis	ATCC	10708
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Choleraesuis var Kunzendorf	ATCC	12011
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Cubana	UPENN	STS 24
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Derby *	NCTC	5721
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Drypool	UPENN	STS 26
<i>Salmonella</i>	<i>enterica</i>	<i>enterica</i>	Dublin	ATCC	15480

FIG. 14

Salmonella	enterica	enterica	Eastbourne	FDA	4017H
Salmonella	enterica	enterica	Enteritidis *	ATCC	13076
Salmonella	enterica	enterica	Give	UPENN	STS 42
Salmonella	enterica	enterica	Glostrup	ATCC	BAA-556
Salmonella	enterica	enterica	Grumpensis	NCTC	6533
Salmonella	enterica	enterica	Haardt	UPENN	STS 44
Salmonella	enterica	enterica	Hadar *	ATCC	51956
Salmonella	enterica	enterica	Hartford	NCTC	6802
Salmonella	enterica	enterica	Havana	UPENN	STS 47
Salmonella	enterica	enterica	Heidelberg *	ATCC	8326
Salmonella	enterica	enterica	Illinois	ATCC	11646
Salmonella	enterica	enterica	Indiana	NCTC	11304
Salmonella	enterica	enterica	Infantis *	ATCC	51741
Salmonella	enterica	enterica	Java	ATCC	BAA-1584
Salmonella	enterica	enterica	Javiana *	ATCC	10721
Salmonella	enterica	enterica	Jerusalem	Q Labs	QL024.12
Salmonella	enterica	enterica	Johannesburg	UPENN	STS 56
Salmonella	enterica	enterica	Kahla	ATCC	17980
Salmonella	enterica	enterica	Kedougou	NCTC	12173
Salmonella	enterica	enterica	Kentucky	ATCC	9263
Salmonella	enterica	enterica	Krefeld	UPENN	STS 58
Salmonella	enterica	enterica	Lille	UPENN	STS 59
Salmonella	enterica	enterica	Litchfield *	NCTC	6028
Salmonella	enterica	enterica	Livingstone	UPENN	STS 63
Salmonella	enterica	enterica	Lomalinda	NCTC	6705
Salmonella	enterica	enterica	London	UPENN	STS 64
Salmonella	enterica	enterica	Manhattan	UPENN	STS 65
Salmonella	enterica	enterica	Mbandaka *	UPENN	STS 66
Salmonella	enterica	enterica	Meleagridis	Q Labs	12074-1
Salmonella	enterica	enterica	Menden	ATCC	15992
Salmonella	enterica	enterica	Minnesota	UPENN	STS 70

FIG. 14 (cont.)

Genus	Species	Source	Reference No.
<i>Bacillus</i>	<i>cereus</i>	ATCC	14579
<i>Bacillus</i>	<i>subtilis</i>	ATCC	6051
<i>Citrobacter</i>	<i>braakii</i>	ATCC	43162
<i>Citrobacter</i>	<i>farmeri</i>	ATCC	51633
<i>Citrobacter</i>	<i>freundii</i>	ATCC	511158090
<i>Citrobacter</i>	<i>rodentium</i>	ATCC	51459
<i>Citrobacter</i>	<i>sedlakii</i>	ATCC	51115
<i>Citrobacter</i>	<i>youngae</i>	ATCC	11102
<i>Cronobacter</i>	<i>sakazakii</i>	Cornell FSL	F6-051
<i>Enterobacter</i>	<i>aerogenes</i>	ATCC	35029
<i>Enterobacter</i>	<i>amnigenus</i>	ATCC	51816
<i>Enterobacter</i>	<i>cancerogenus</i>	Q Labs	QL11010-2
<i>Enterobacter</i>	<i>cloacae</i>	ATCC	13047
<i>Enterobacter</i>	<i>gergocvia</i>	ATCC	33028
<i>Escherichia</i>	<i>blattae</i>	ATCC	29907
<i>Escherichia</i>	<i>coli</i> (O157:H7)	ATCC	8739
<i>Escherichia</i>	<i>coli</i>	ATCC	43895
<i>Escherichia</i>	<i>fergusonii</i>	ATCC	35469
<i>Escherichia</i>	<i>hermannii</i>	ATCC	33650
<i>Hafnia</i>	<i>alvei</i>	ATCC	51815
<i>Klebsiella</i>	<i>pneumoniae</i>	ATCC	13440
<i>Klebsiella</i>	<i>oxytoca</i>	ATCC	11686
<i>Listeria</i>	<i>monocytogenes</i>	ATCC	7644
<i>Pluralibacter</i>	<i>gregoviae</i>	ATCC	33028
<i>Proteus</i>	<i>mirabilis</i>	ATCC	7002
<i>Proteus</i>	<i>hauseri</i>	ATCC	13315
<i>Proteus</i>	<i>vulgaris</i>	ATCC	6380
<i>Pseudomonas</i>	<i>aeruginosa</i>	Q Labs	333046.46
<i>Salmonella</i>	<i>bongori</i>	NCTC	12419
<i>Salmonella</i>	<i>bongori</i>	ATCC	43975
<i>Salmonella</i>	<i>bongori</i>	NCTC	10946
<i>Serratia</i>	<i>marcescens</i>	ATCC	8100
<i>Serratia</i>	<i>marescens</i>	ATCC	8100
<i>Shigella</i>	<i>boydii</i>	ATCC	9207
<i>Vibrio</i>	<i>vulnificus</i>	Q Labs	QL021111A

FIG. 15

Salmonella enterica supsp. *enterica* serovar Abony

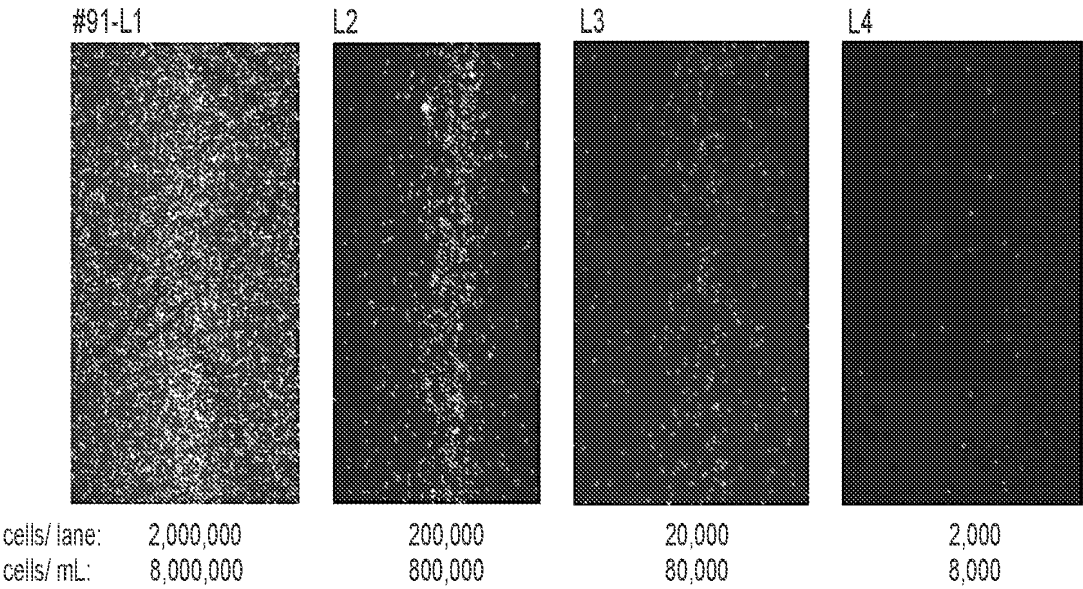


FIG. 16

Salmonella enterica supsp. *enterica* serovar California

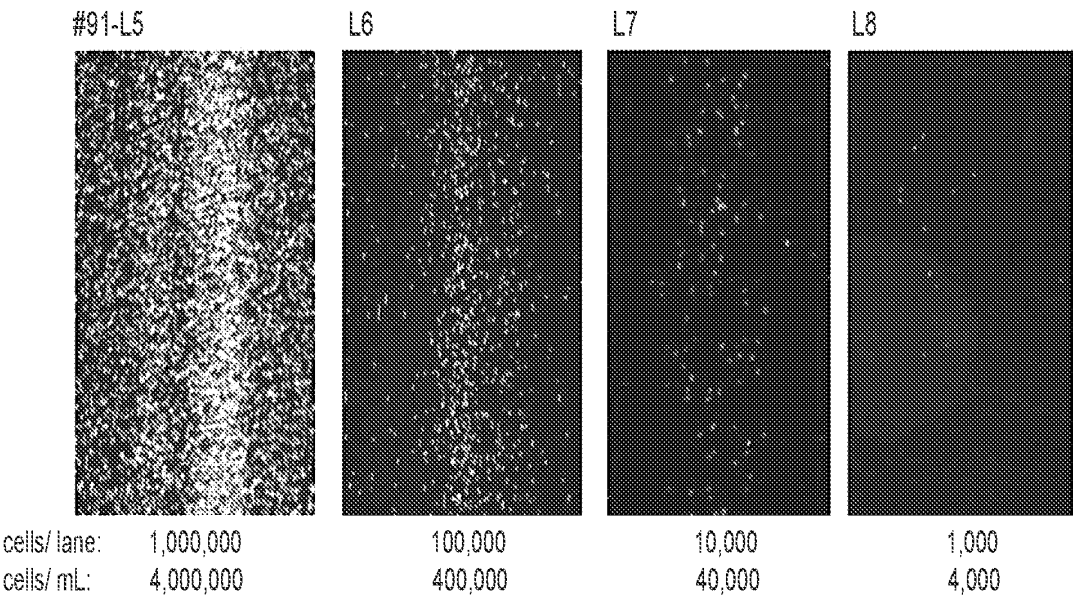


FIG. 17

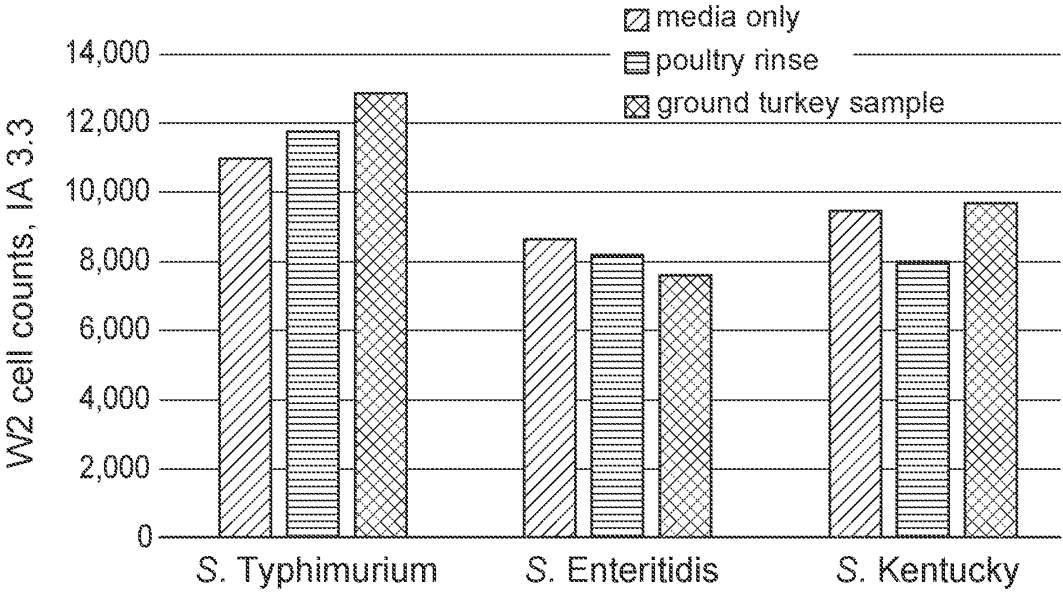


FIG. 18

Increased levels of *Salmonella* added to media or ground turkey samle, N=3

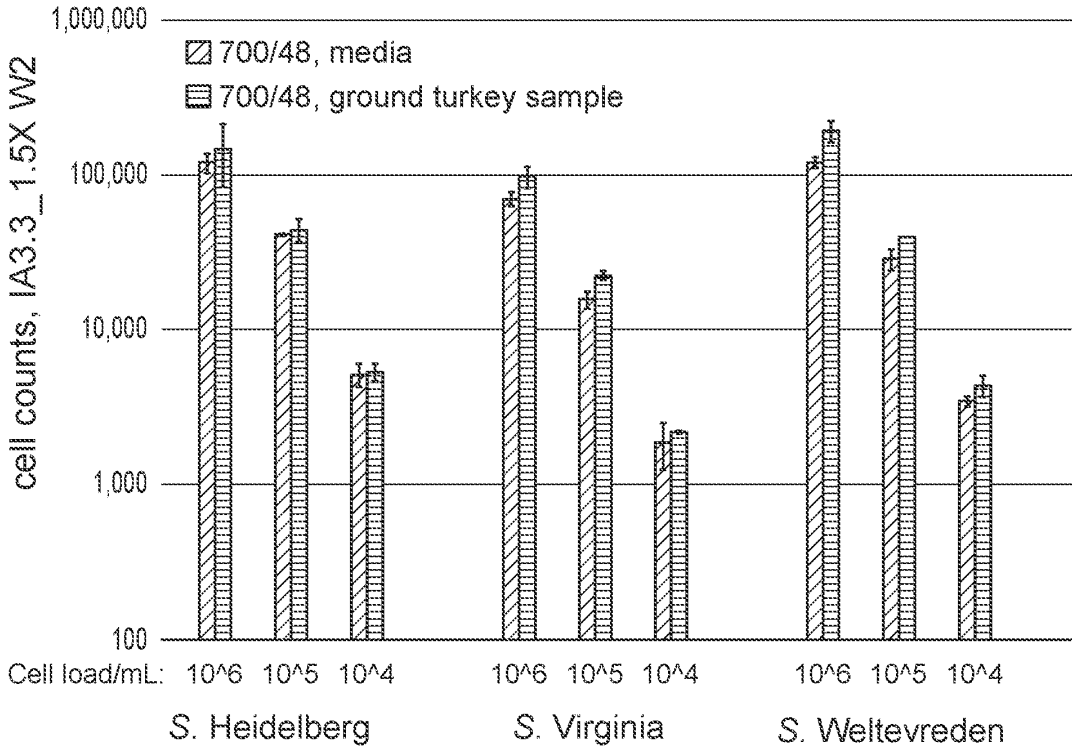
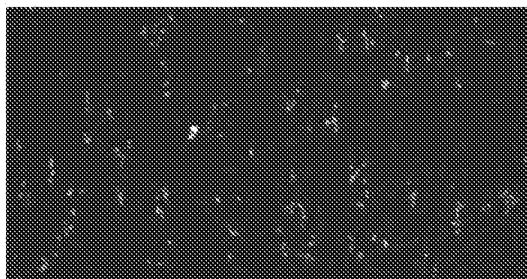


FIG. 19

SAL-4020-A0064, L10. 700/48. 1A 3.3: 3,225



SAL-4020-A0064, L9. "Mock" labeling, no probes

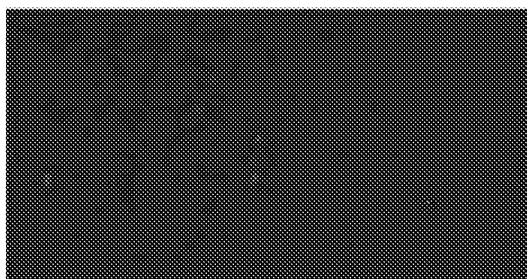


FIG. 20

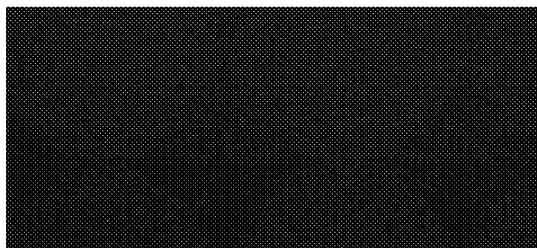
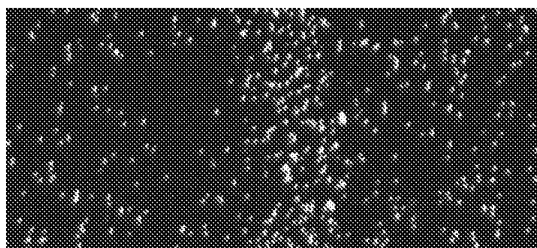


FIG. 21

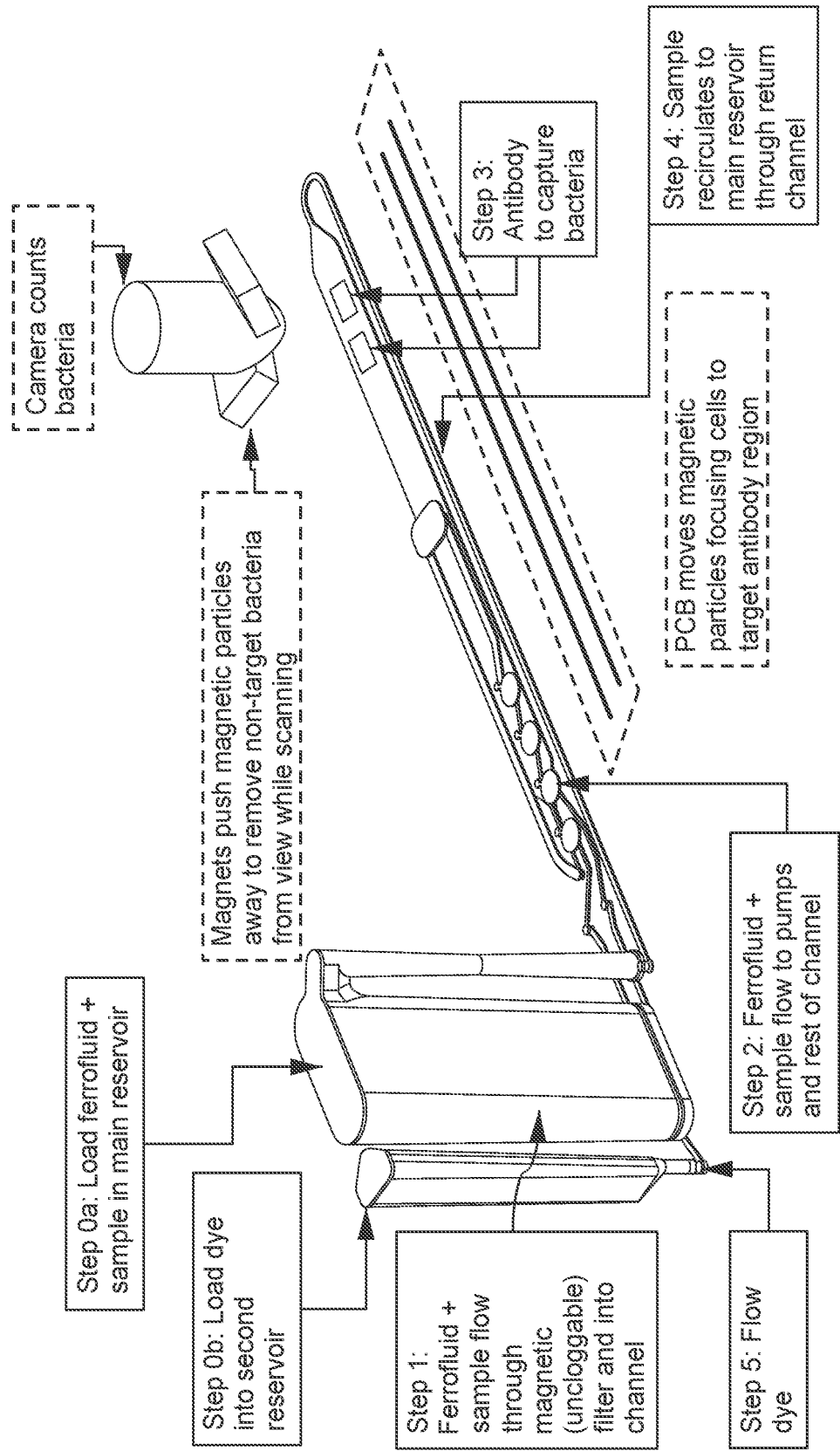
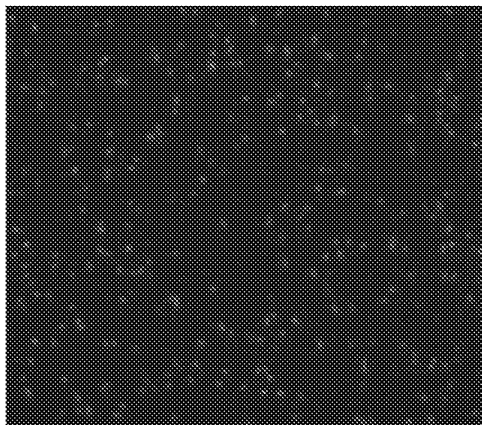


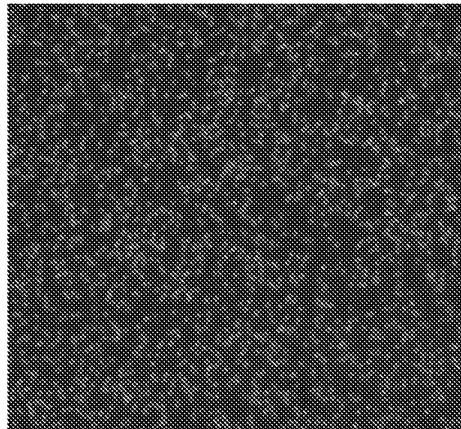
FIG. 22

A*Salmonella* Typhimurium, 11-hour culture

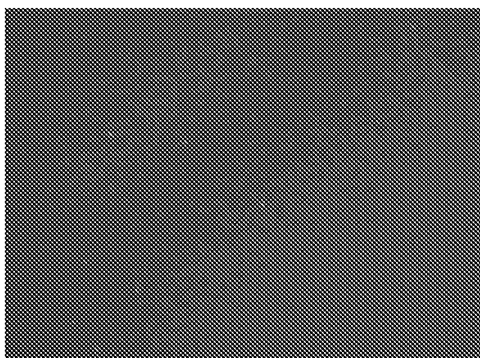
No signal recovery

*Salmonella* Typhimurium, 11-hour culture

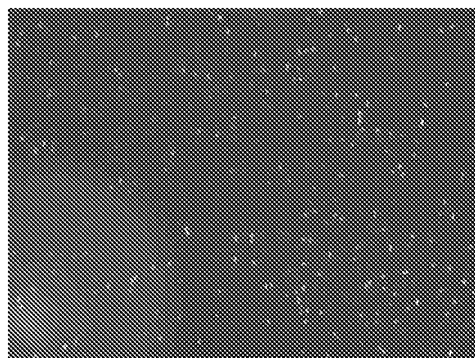
With 30 min signal recovery

**B**Fecal sample with *S. Typhimurium*, 11-hour enrichment

No signal recovery



Same sample after 30 min signal recovery

**FIG. 23**

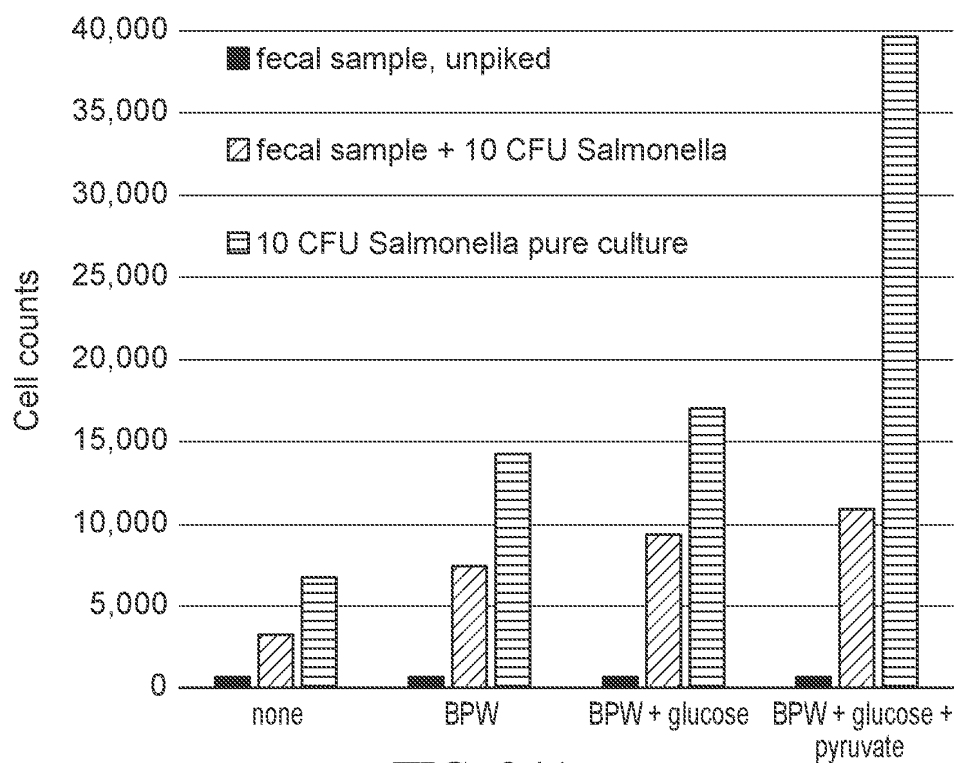
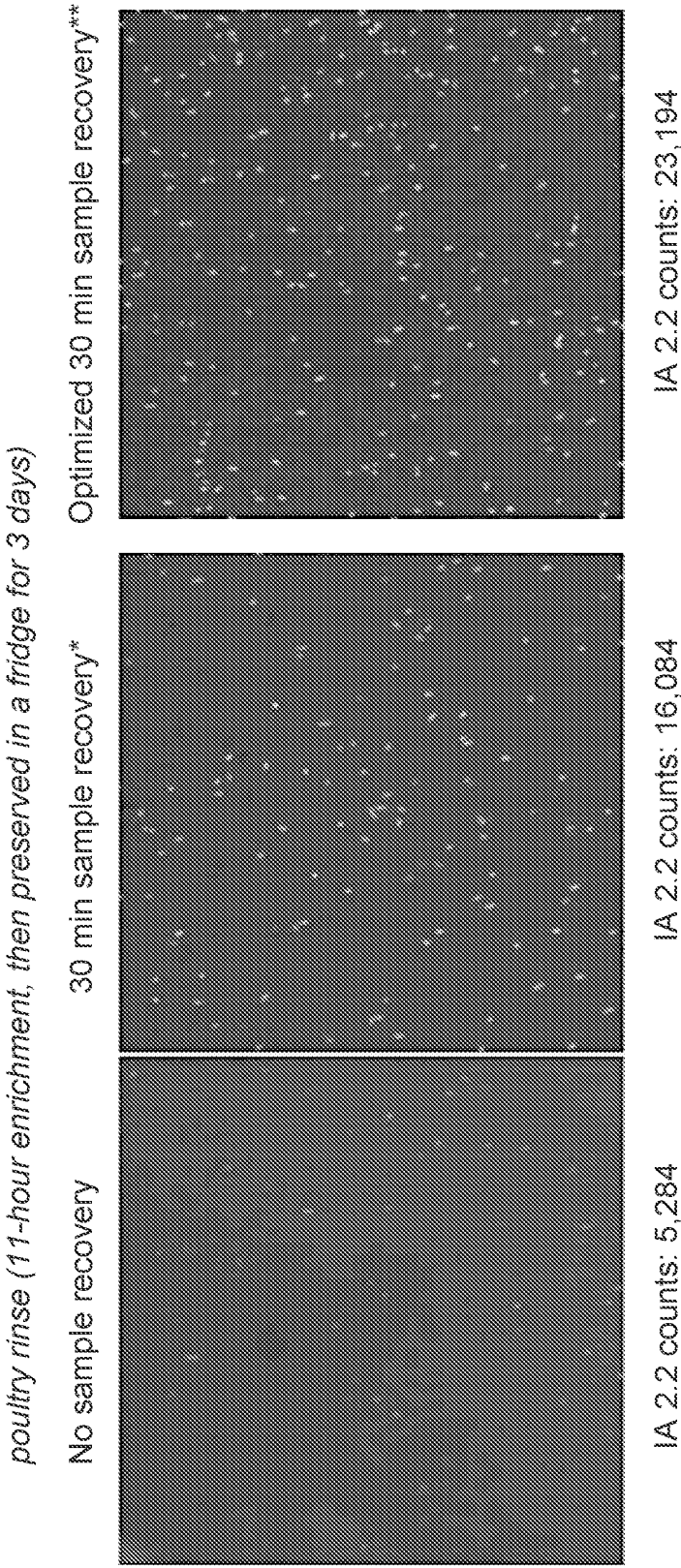


FIG. 24A

Glucose	Pyruvate	pure culture (aged 5 days, 1/10 dilution)		poultry rinse (cold-preserved for 3 days)	
		#8205	#8206	#8207	#8211
-	-	5,737	3,038	5,449	5,284
20 mM	-	19,817	9,613	15,360	16,175
40 mM	-	31,675	24,000	15,688	16,115
80 mM	-	6,317	12,234	18,693	17,400
200 mM	-	22,644	24,331	16,873	16,738
-	1 mM	32,541	33,534	11,451	14,075
-	5 mM	33,676	9,689	12,505	16,084
-	10 mM	23,624	14,703	20,753	24,780
-	20 mM	26,290	17,804	17,997	25,469
40 mM	5 mM	26,275	20,205	21,591	25,387
80 mM	10 mM	10,421	12,425	21,940	26,809
200 mM	20 mM	43,502	43,849	22,546	23,194

FIG. 24B



* Sample recovery media contained 5 mM sodium pyruvate

** Optimized sample recovery media contained 200 mM glucose and 20 mM sodium pyruvate

FIG. 24C

Sequence of the target site of 16S rRNA: UAACGCGUUAAGUAGACCGCCUGGGGAG

Salmonella probe: GTCTACTTAAC- Lys- Alexa488

Helper probe 1: GTTTTAACCTTGCGG

Helper probe 2: CGCGTTAGCTCC

Probes that include **G874** and **A876** of 16S will recognize all species from *Salmonella* genus, excluding *S. bongori* and *S. subterranea* (isolated in 2005 from radioactive sewage)

FIG. 25