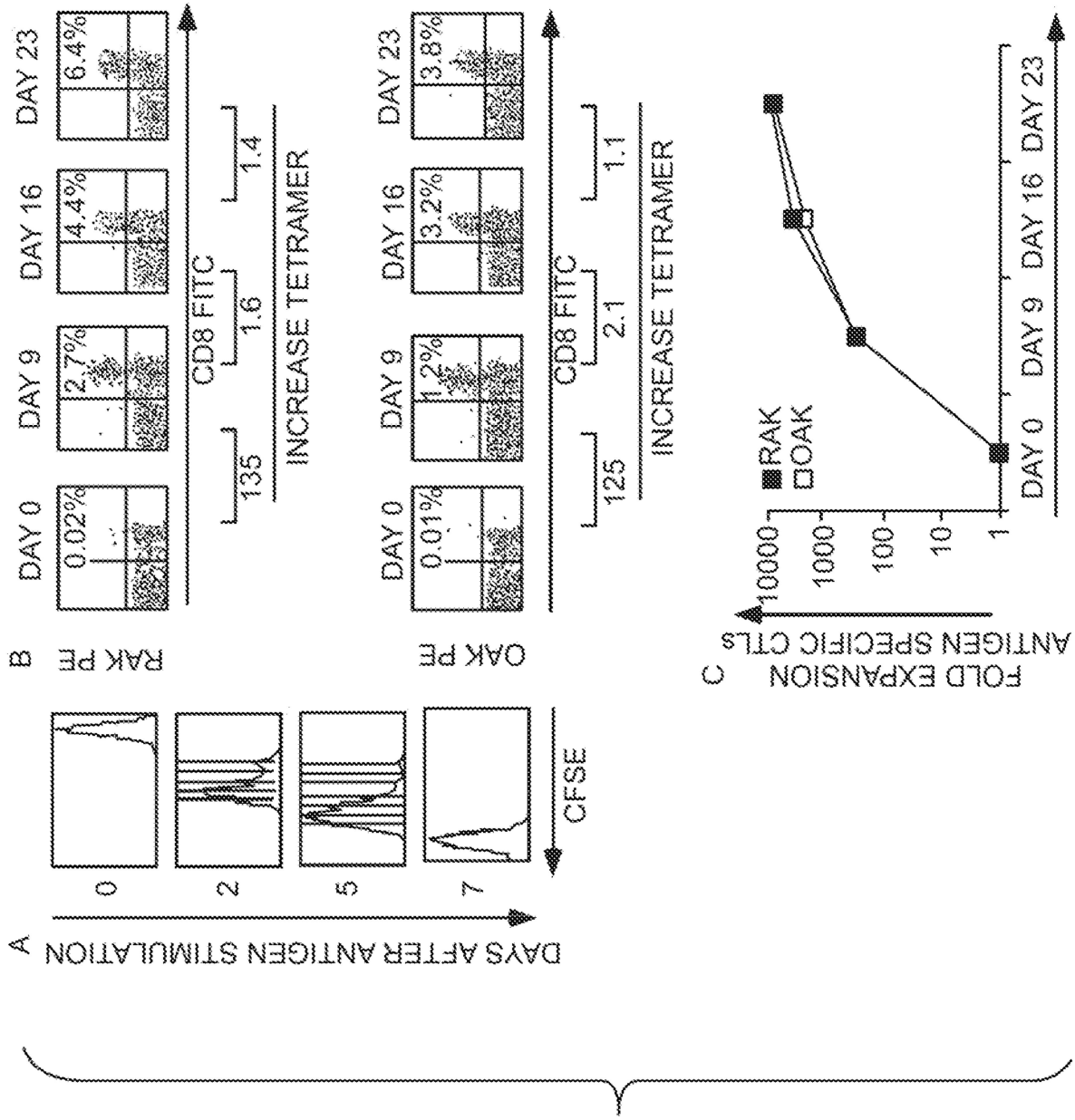

A
DAYS AFTER ANTIGEN STIMULATION
0
2
5
7
CFSE
B
RAK PE
OAK PE
DAY 0
DAY 9
DAY 16
DAY 23
0.02%
2.7%
4.4%
6.4%
0.01%
1.2%
3.2%
3.8%
CD8 FITC
135
1.6
1.4
125
2.1
1.1
INCREASE TETRAMER
C
FOLD EXPANSION
ANTIGEN SPECIFIC CTLs
10000
1000
100
10
1
RAK
OAK
DAY 0
DAY 9
DAY 16
DAY 23
TIME IN CULTURE

Fig. 1

Fig. 2

EXPECTED AND OBSERVED CTL EXPANSION							
CELL DOUBLING	1	2	3	4	5	6	7
EXPECTED FOLD EXPANSION	2	4	8	16	32	64	128
OBSERVED FOLD EXPANSION (DAY 0 TO 9)							258 RANGE (48 TO 409)
OBSERVED FOLD EXPANSION (DAY 9 TO 16)							5.7 RANGE (2.2 TO 10.6)
OBSERVED FOLD EXPANSION (DAY 16 TO 23)							4.3 RANGE (4.1 TO 14.9)

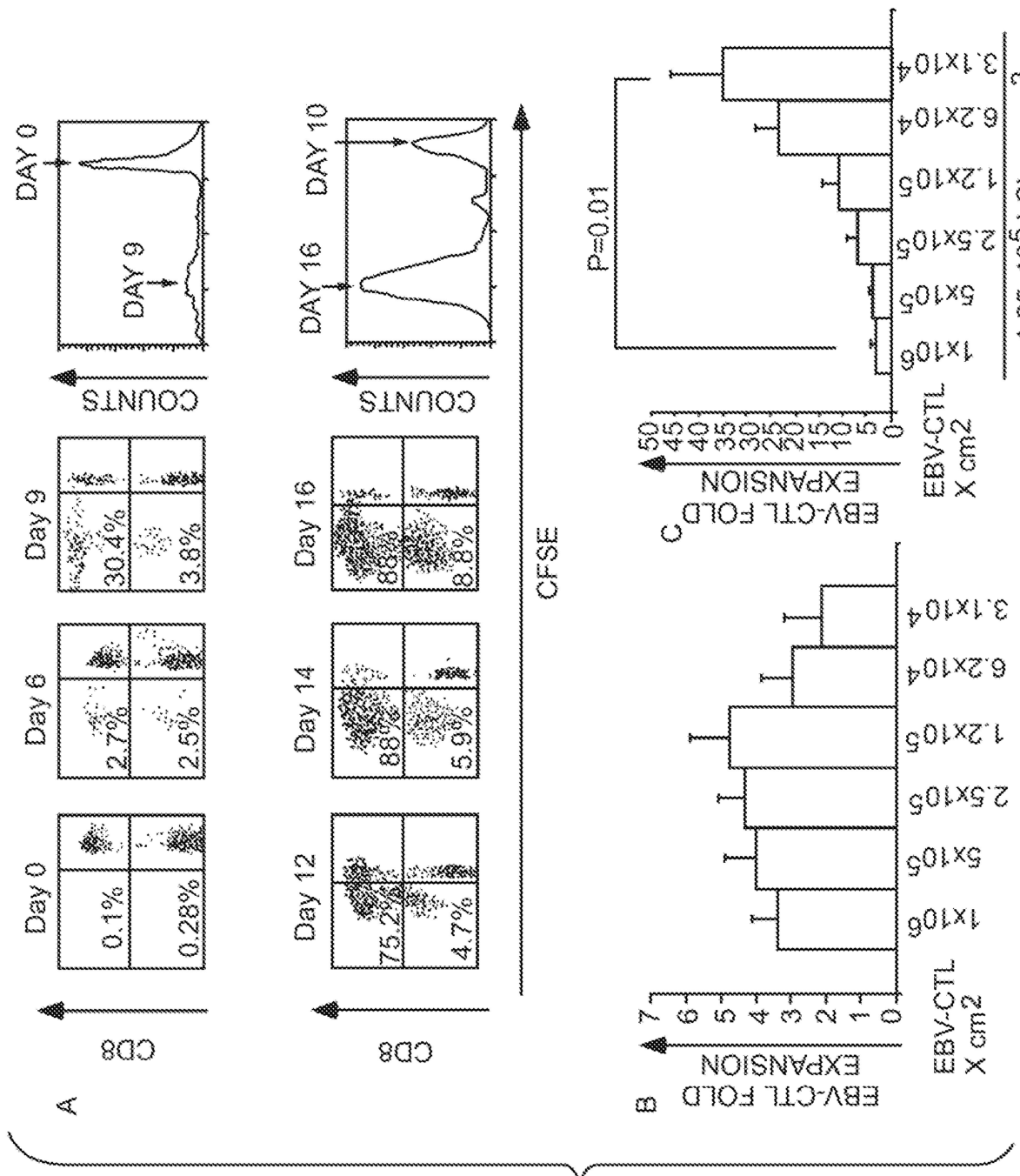
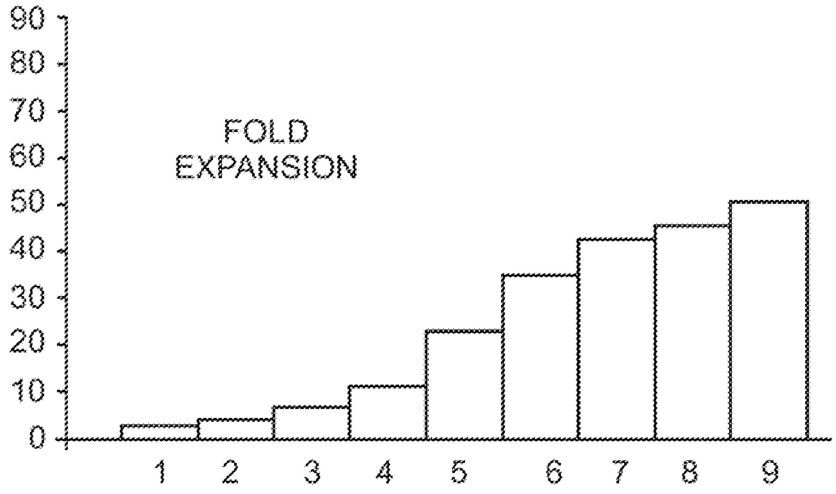

A
CD8
Day 0
Day 6
Day 9
0.1%
0.28%
2.7%
2.5%
30.4%
3.8%
COUNTS
DAY 0
DAY 9
Day 12
Day 14
Day 16
75.2%
4.7%
88%
5.9%
88%
8.8%
DAY 16
DAY 10
CFSE
B
EBV-CTL FOLD EXPANSION
EBV-CTL X cm2
1x10^6
5x10^5
2.5x10^5
1.2x10^5
6.2x10^4
3.1x10^4
C
P=0.01
1.25x10^5 LCLs x cm^2

Fig. 3

Fig. 4

	CTL/cm^2	LCL/cm^2	TOTAL CTL + LCL	R:S RATIO
1	1,000,000	125,000	1,125,000	8:1
2	500,000	125,000	625,000	4:1
3	250,000	125,000	375,000	2:1
4	125,000	125,000	250,000	1:1
5	62,500	125,000	187,500	1:2
6	31,250	125,000	156,250	1:4
7	15,625	125,000	140,625	1:8
8	7,812	125,000	132,812	1:16
9	3,906	125,000	128,906	1:32



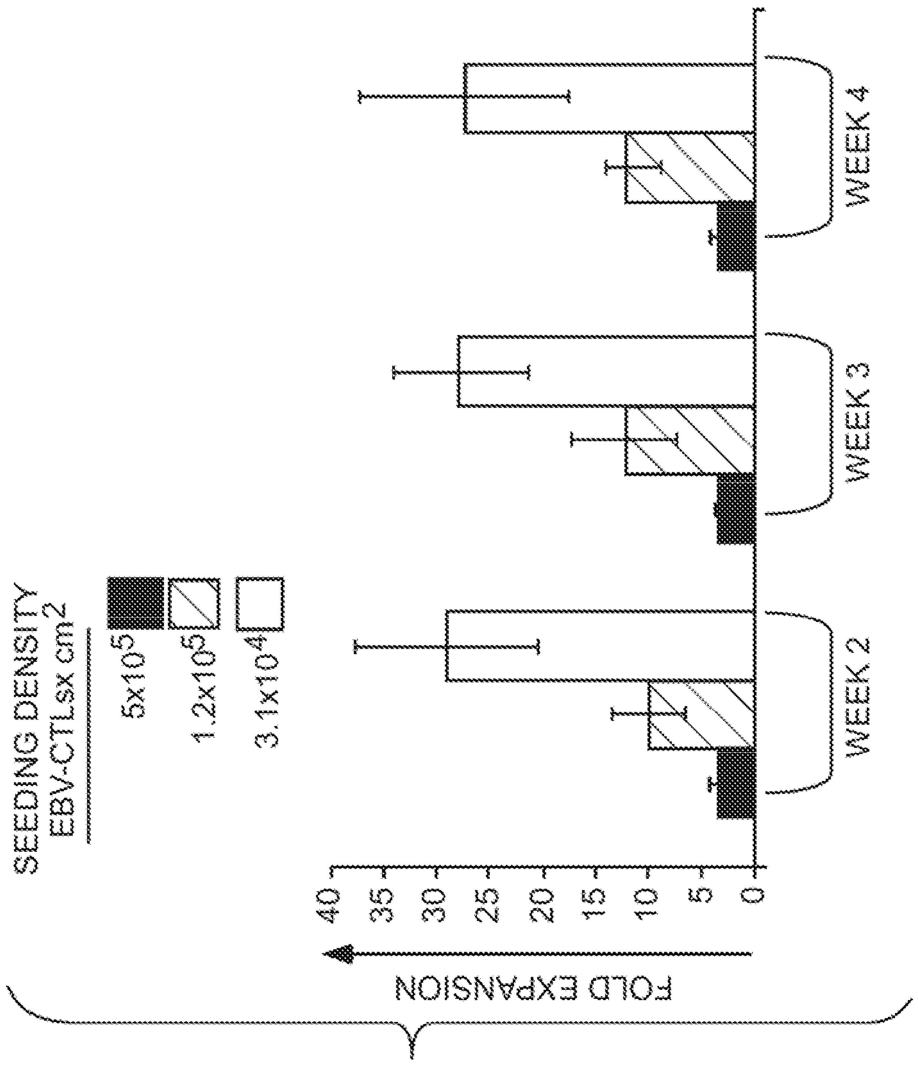

SEEDING DENSITY
EBV-CTLsx cm2
5x10^5
1.2x10^5
3.1x10^4
FOLD EXPANSION
40
35
30
25
20
15
10
5
0
WEEK 2
WEEK 3
WEEK 4

Fig. 5

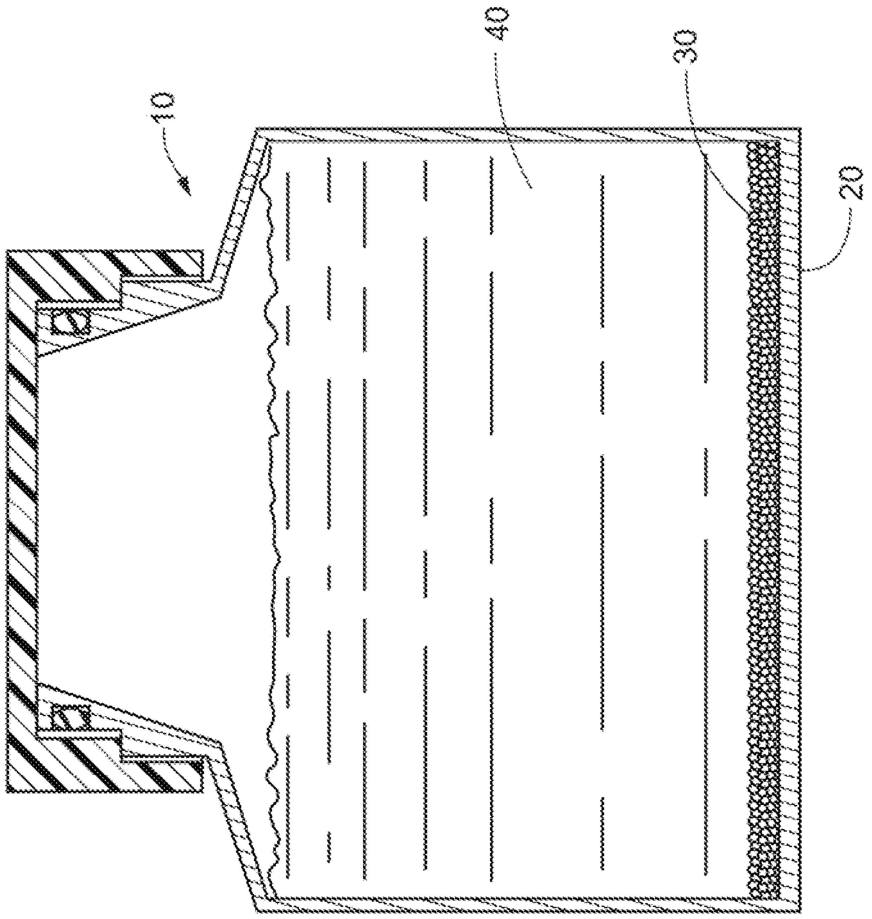


Fig. 6

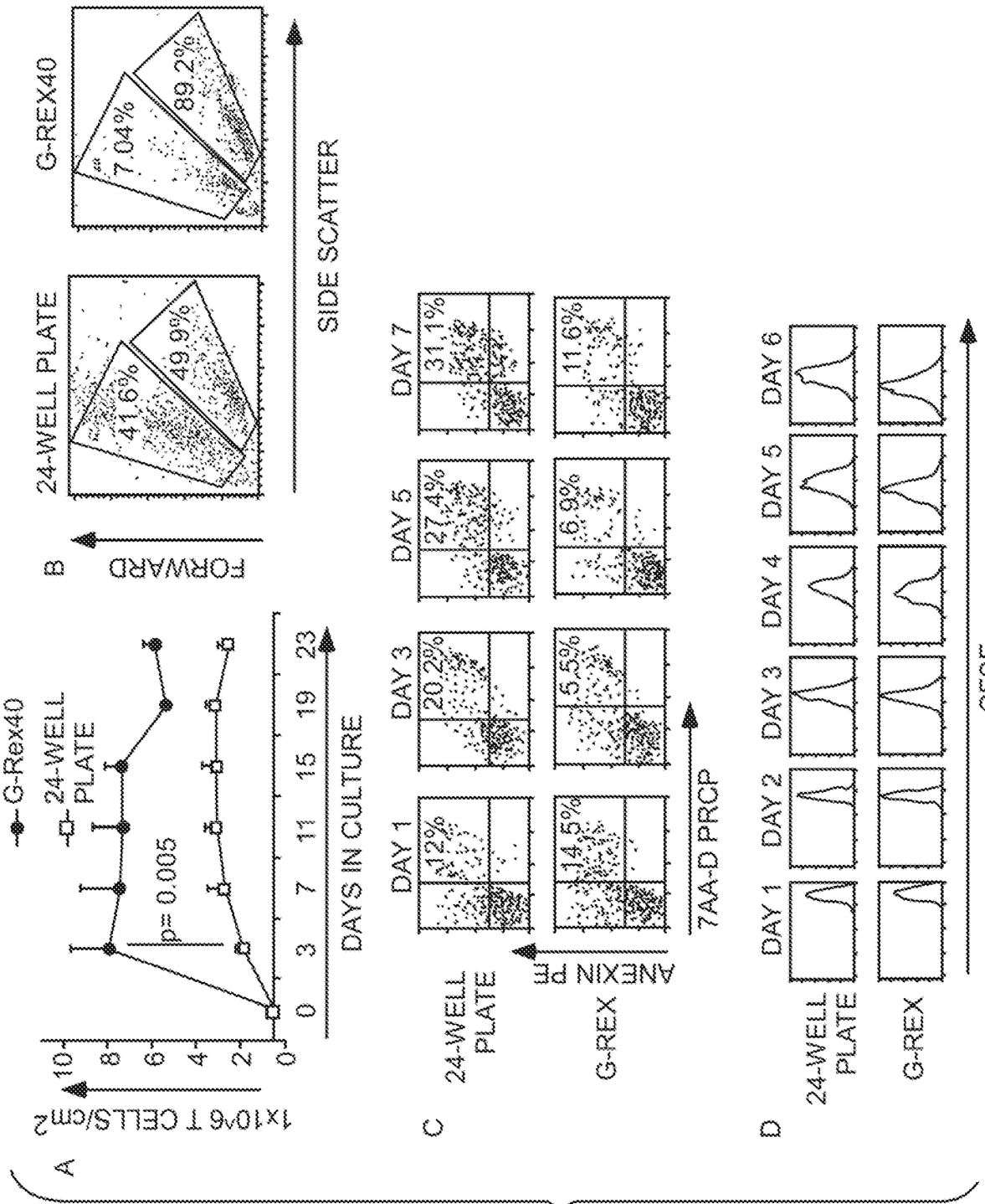

A
G-Rex40
24-WELL PLATE
p= 0.005
1x10^6 T CELLS/cm2
DAYS IN CULTURE
B
24-WELL PLATE
G-REX40
41.6%
49.9%
7.04%
89.2%
FORWARD
SIDE SCATTER
C
24-WELL PLATE
G-REX
DAY 1
DAY 3
DAY 5
DAY 7
12%
20.2%
27.4%
31.1%
14.5%
5.5%
6.9%
11.6%
ANEXIN PE
7AA-D PRCP
D
24-WELL PLATE
G-REX
DAY 1
DAY 2
DAY 3
DAY 4
DAY 5
DAY 6
CFSE

Fig. 7

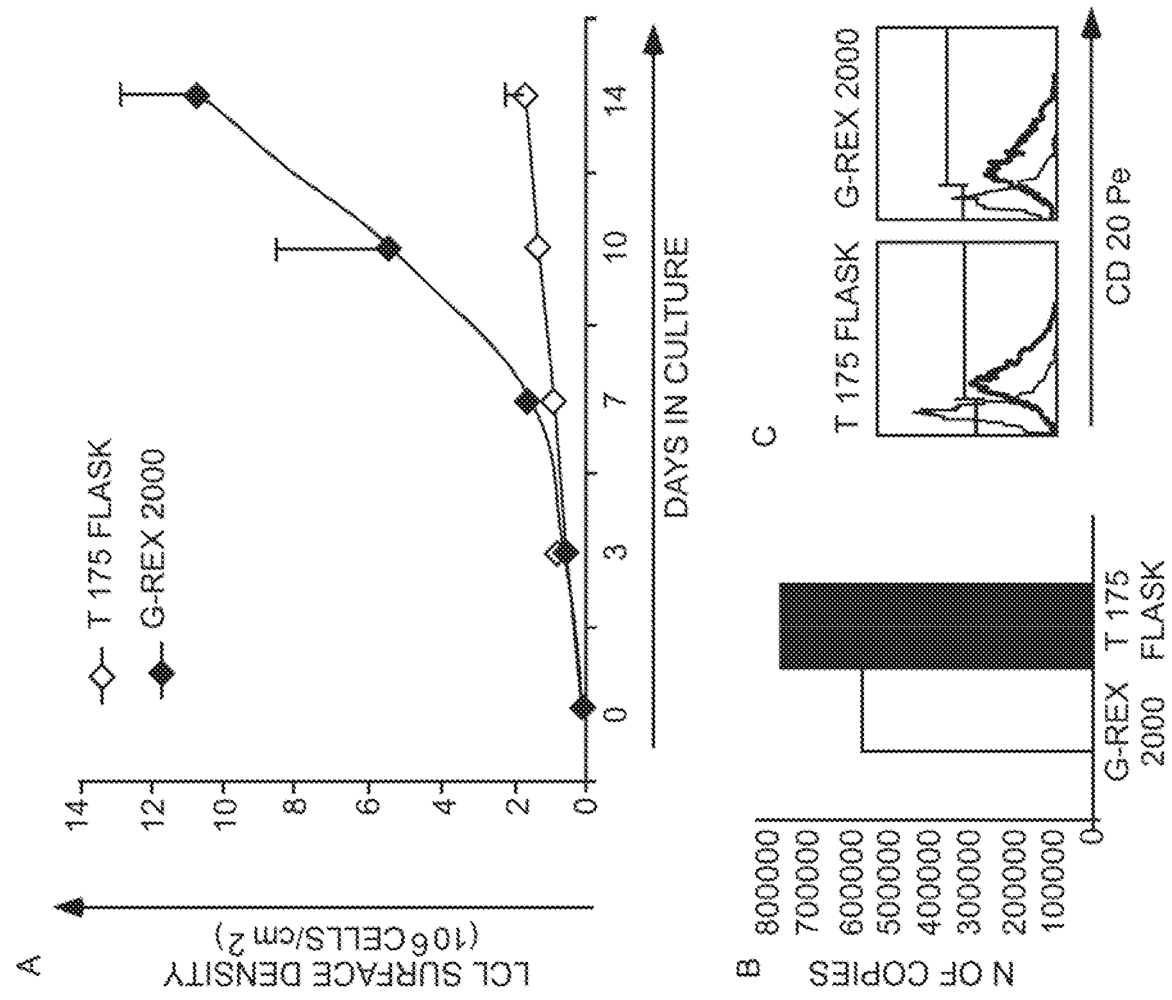
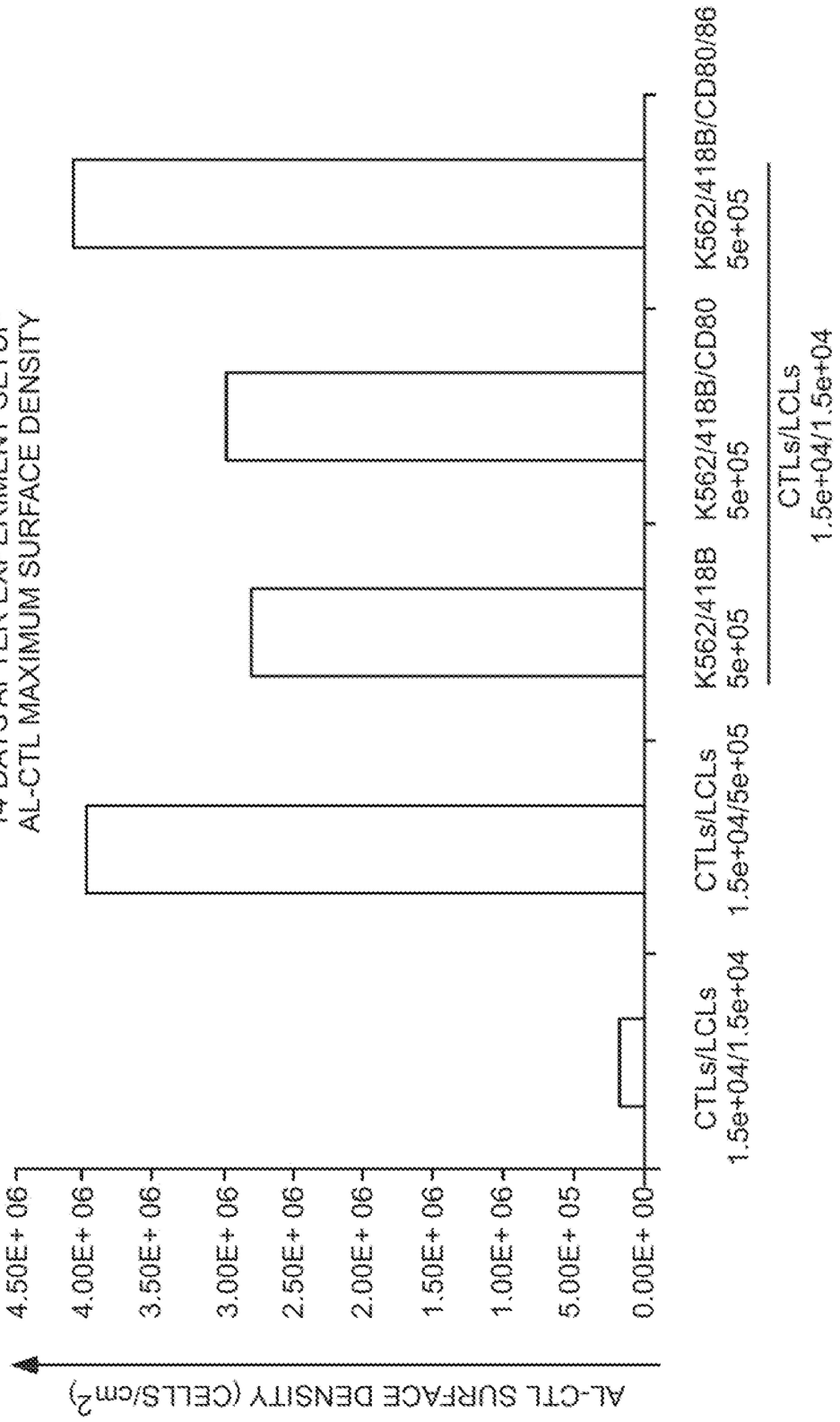

A
LCL SURFACE DENSITY
(10^6 CELLS/cm^2)
14
12
10
8
6
4
2
0
T 175 FLASK
G-REX 2000
0
3
7
10
14
DAYS IN CULTURE
B
N OF COPIES
800000
700000
600000
500000
400000
300000
200000
100000
0
G-REX 2000
T 175 FLASK
C
T 175 FLASK
G-REX 2000
CD 20 Pe

Fig. 8

Fig. 9


14 DAYS AFTER EXPERIMENT SETUP
AL-CTL MAXIMUM SURFACE DENSITY
AL-CTL SURFACE DENSITY (CELLS/cm2)
4.50E+ 06
4.00E+ 06
3.50E+ 06
3.00E+ 06
2.50E+ 06
2.00E+ 06
1.50E+ 06
1.00E+ 06
5.00E+ 05
0.00E+ 00
CTLs/LCLs
1.5e+04/1.5e+04
CTLs/LCLs
1.5e+04/5e+05
K562/418B
5e+05
K562/418B/CD80
5e+05
K562/418B/CD80/86
5e+05
CTLs/LCLs
1.5e+04/1.5e+04

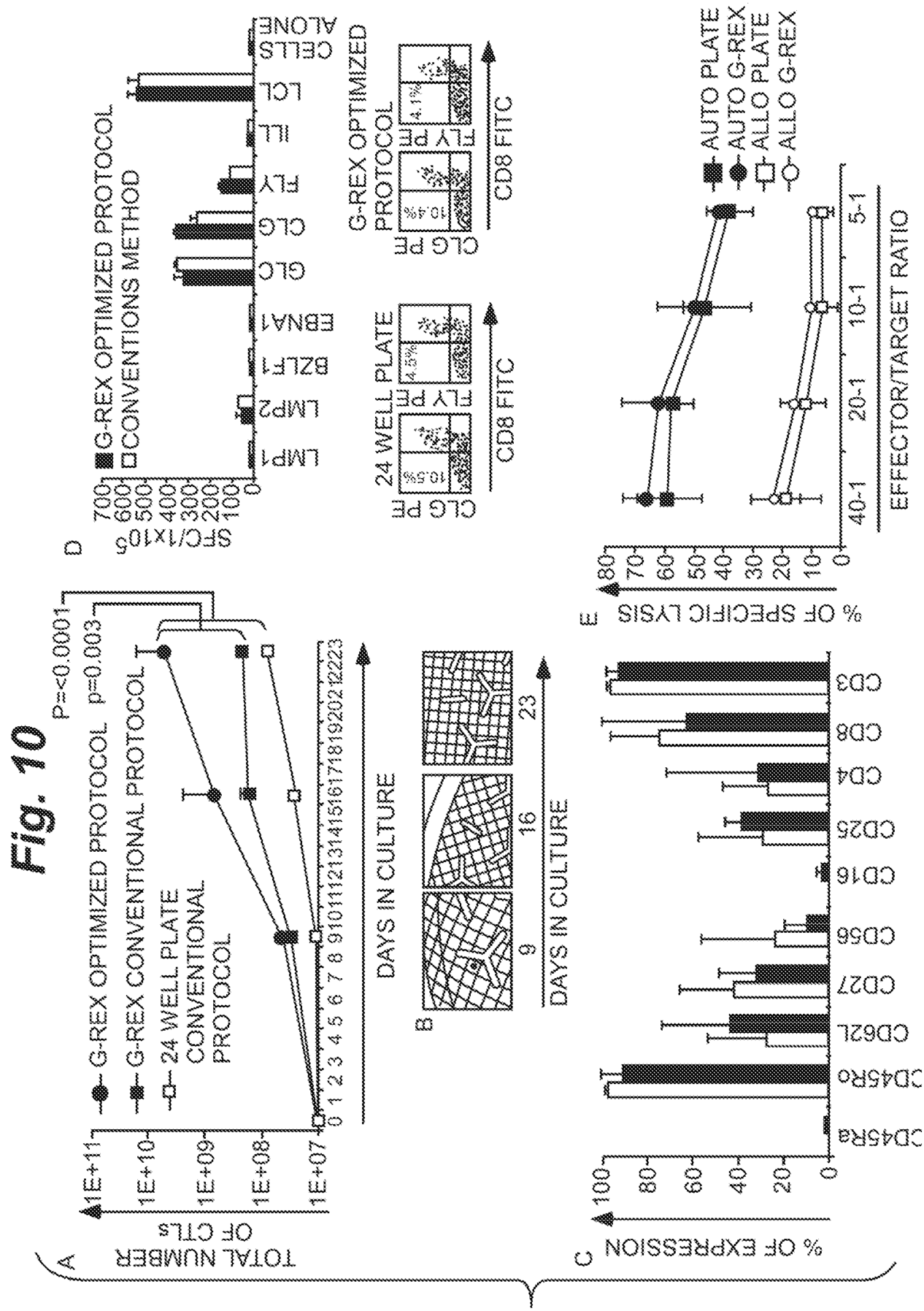

Fig. 10
A
TOTAL NUMBER OF CTLs
P=<0.0001
p=0.003
G-REX OPTIMIZED PROTOCOL
G-REX CONVENTIONAL PROTOCOL
24 WELL PLATE CONVENTIONAL PROTOCOL
DAYS IN CULTURE
B
DAYS IN CULTURE
C
% OF EXPRESSION
CD45Ra
CD45Ro
CD62L
CD27
CD56
CD16
CD25
CD4
CD8
CD3
D
SFC/1x10^5
G-REX OPTIMIZED PROTOCOL
CONVENTIONS METHOD
LMP1
LMP2
BZLF1
EBNA1
GLC
CLG
FLY
ILL
LCL
CELLS ALONE
24 WELL PLATE
G-REX OPTIMIZED PROTOCOL
CLG PE
FLY PE
CD8 FITC
E
% OF SPECIFIC LYSIS
AUTO PLATE
AUTO G-REX
ALLO PLATE
ALLO G-REX
EFFECTOR/TARGET RATIO

Fig. 11

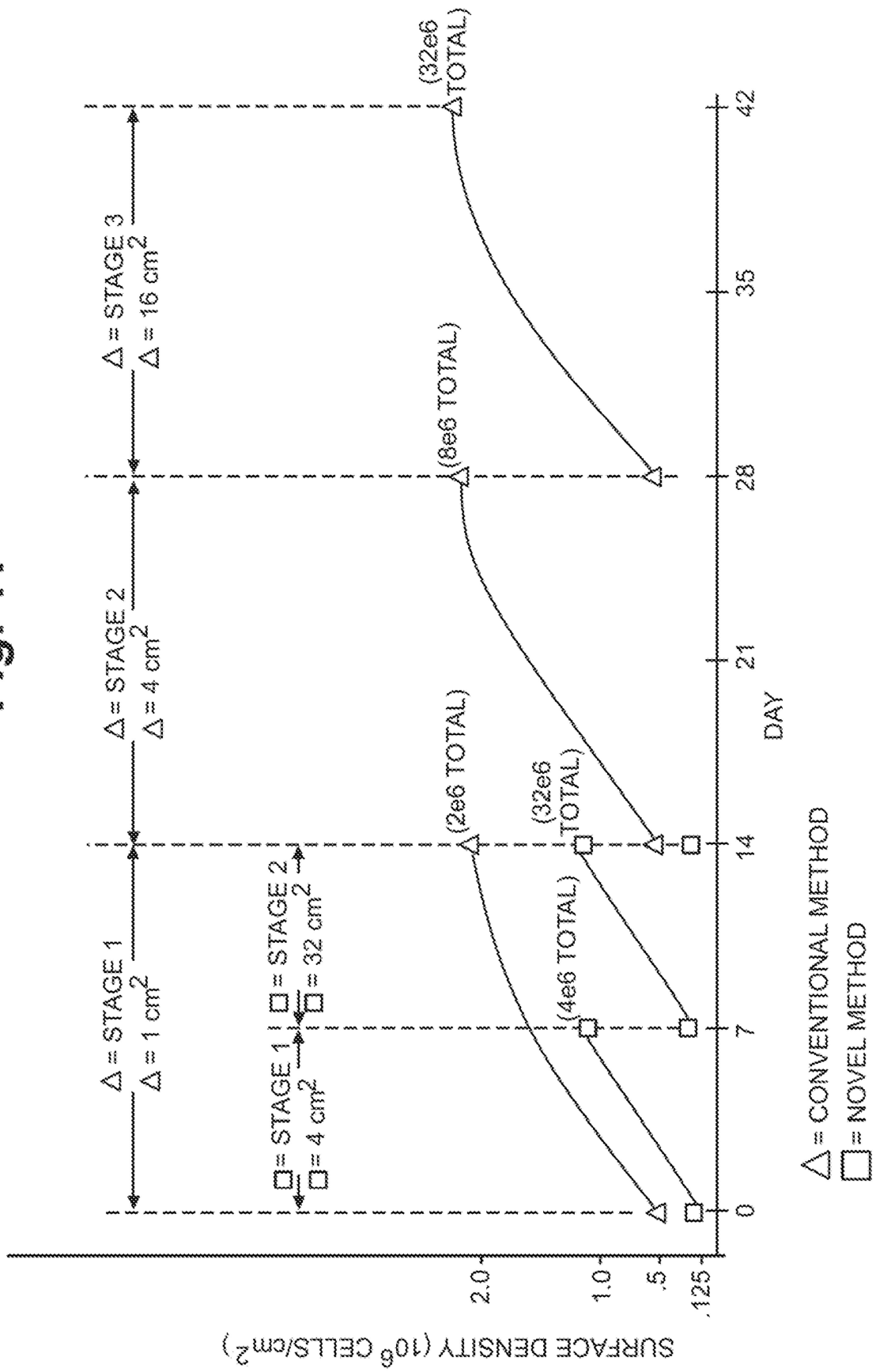

SURFACE DENSITY (10^6 CELLS/cm^2)
2.0
1.0
.5
.125
0
7
14
21
28
35
42
DAY
Δ = STAGE 1
Δ = 1 cm^2
Δ = STAGE 2
Δ = 4 cm^2
Δ = STAGE 3
Δ = 16 cm^2
□ = STAGE 1
□ = 4 cm^2
□ = STAGE 2
□ = 32 cm^2
(2e6 TOTAL)
(4e6 TOTAL)
(8e6 TOTAL)
(32e6 TOTAL)
(32e6 TOTAL)
Δ = CONVENTIONAL METHOD
□ = NOVEL METHOD

Fig. 12

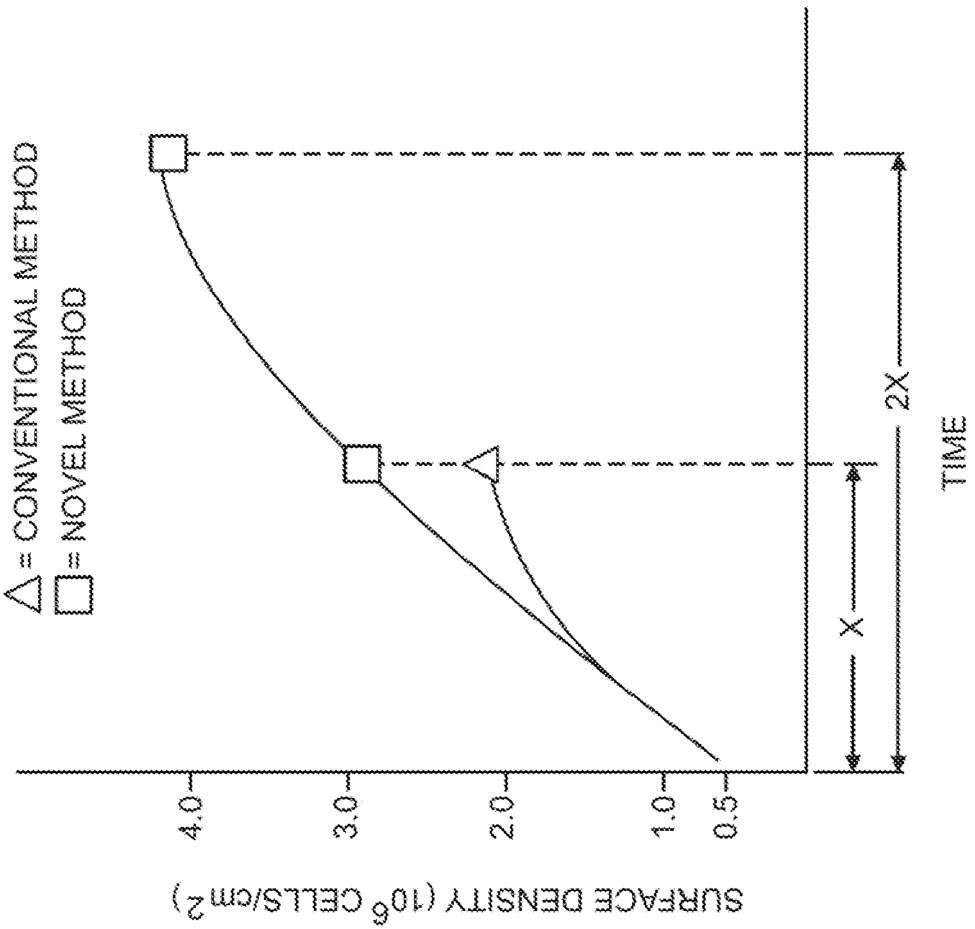

△ = CONVENTIONAL METHOD
□ = NOVEL METHOD
SURFACE DENSITY (10^6 CELLS/cm^2)
4.0
3.0
2.0
1.0
0.5
X
2X
TIME

Fig. 13

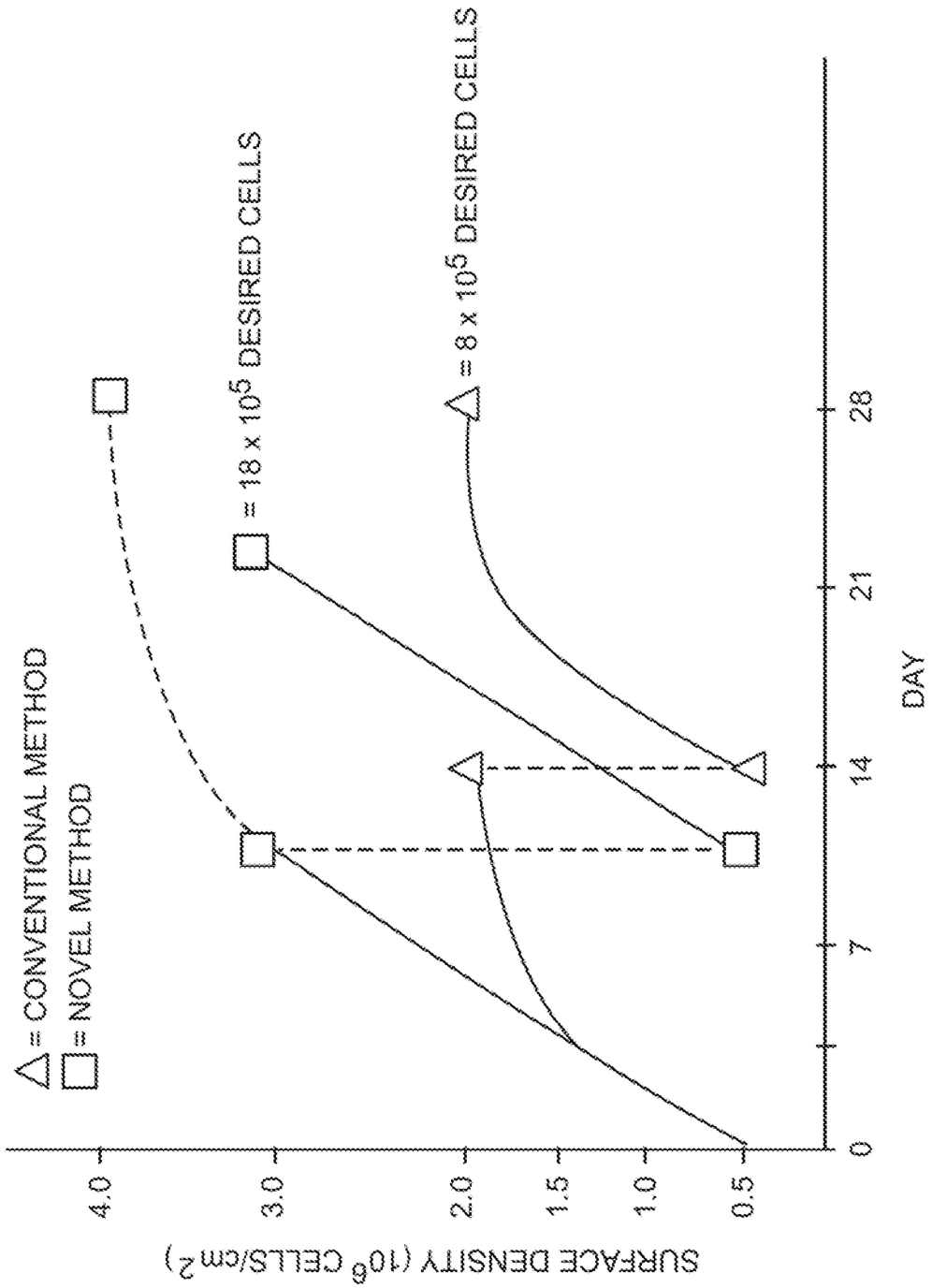

△ = CONVENTIONAL METHOD
□ = NOVEL METHOD
□ = 18 x 10^5 DESIRED CELLS
△ = 8 x 10^5 DESIRED CELLS
SURFACE DENSITY (10^6 CELLS/cm^2)
4.0
3.0
2.0
1.5
1.0
0.5
0
7
14
21
28
DAY

Fig. 14

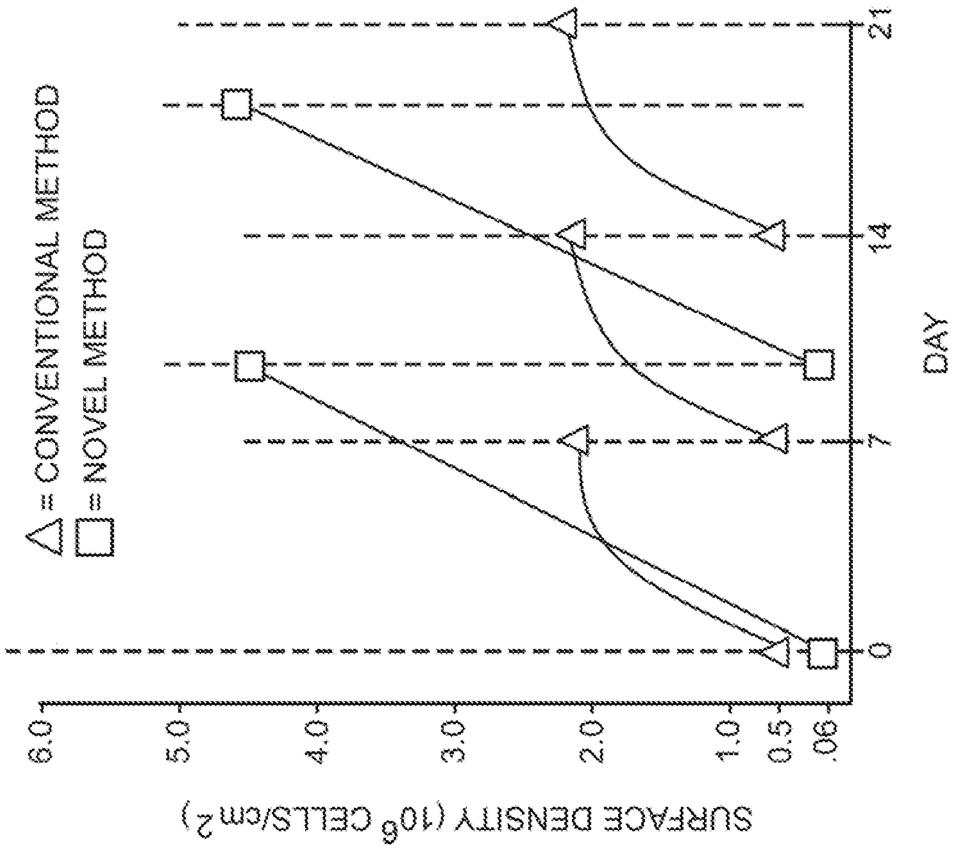

△ = CONVENTIONAL METHOD
□ = NOVEL METHOD
SURFACE DENSITY (10^6 CELLS/cm^2)
6.0
5.0
4.0
3.0
2.0
1.0
0.5
.06
0
7
14
21
DAY

Fig. 15

	CONVENTIONAL				
CYCLE	1	2	3	4	5
DAYS PER CYCLE	7	7	7	7	7
CUMULATIVE DAYS	7	14	21	28	35
SURFACE AREA (CM^2)	4	16	64	256	1024
STARTING SURFACE DENSITY ($CELLS/CM^2$)	1	1	1	1	1
FINAL SURFACE DENSITY ($CELLS/CM^2$)	2	2	2	2	2
CELLS PRODUCED ($x10^6$)	8	32	128	512	2048
		NOVEL			
CYCLE	1	2	3		
DAYS PER CYCLE (APPROX.)	9.5	9.5	15.0		
CUMULATIVE DAYS	9.5	19.0	34.0		
SURFACE AREA (CM^2)	8	625	46875		
STARTING SURFACE DENSITY ($CELLS/CM^2$)	0.06	0.06	0.06		
FINAL SURFACE DENSITY ($CELLS/CM^2$)	4.50	4.50	4.50		
CELLS PRODUCED ($x10^6$)	38	2813	210938		

Fig. 16

	CONVENTIONAL				
CYCLE	1	2	3	4	5
DAYS PER CYCLE	7	7	7	7	7
CUMULATIVE DAYS	7	14	21	28	35
SURFACE AREA (CM^2)	4	16	64	256	1024
STARTING SURFACE DENSITY ($CELLS/CM^2$)	1	1	1	1	1
FINAL SURFACE DENSITY ($CELLS/CM^2$)	2	2	2	2	2
CELLS PRODUCED ($x10^6$)	8	32	128	512	2048
		NOVEL			
CYCLE	1	2	3		
DAYS PER CYCLE (APPROX.)	9.5	9.5	15.0		
CUMULATIVE DAYS	9.5	19.0	34.0		
SURFACE AREA (CM^2)	8	625	4018		
STARTING SURFACE DENSITY ($CELLS/CM^2$)	0.06	0.06	0.70		
FINAL SURFACE DENSITY ($CELLS/CM^2$)	4.50	4.50	7.50		
CELLS PRODUCED ($x10^6$)	38	2813	30134		

Fig. 17A

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	1.00E + 06				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME (ml)		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		1.00E + 06	4.71E + 06	9.79E + 06	9.73E + 06
7	CELL DENSITY (cells/ml)		1.00E + 05	4.71E + 05	9.79E + 05	9.73E + 05
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	112	56	0
9	GLUCOSE CONSUMPTION IN (mg/ml)		0	128	184	240
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	6.40E + 08	9.20E + 08	1.20E + 09
11	VIABILITY		100%	100%	99%	90%
12	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT		1.00E + 08	4.71E + 08	9.79E + 08	9.73E + 08

Fig. 17B

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	5.00E + 05				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME (ml)		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		5.00E + 05	3.23E + 06	8.60E + 06	9.53E + 06
7	CELL DENSITY (cells/ml)		5.00E + 04	3.23E + 05	8.60E + 05	9.53E + 05
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	132	76	0
9	GLUCOSE CONSUMPTION IN (mg/ml)		0	108	164	240
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	5.40E + 08	8.20E + 08	1.20E + 09
11	VIABILITY		100%	100%	100%	91%
12	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT		5.00E + 07	3.23E + 08	8.60E + 08	9.53E + 08

Fig. 17C

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	2.50E + 05				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME (ml)		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		2.50E + 05	3.02E + 06	7.53E + 06	1.02E + 07
7	CELL DENSITY (cells/ml)		2.50E + 04	3.02E + 05	7.53E + 05	1.02E + 06
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	134	98	0
9	GLUCOSE CONSUMPTION IN (mg/ml)		0	106	142	240
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	5.30E + 08	7.10E + 08	1.20E + 09
11	VIABILITY		100%	100%	100%	94%
12	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT		2.50E + 07	3.02E + 08	7.53E + 08	1.02E + 09

Fig. 17D

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	1.25E + 05				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME (ml)		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		1.25E + 05	2.65E + 06	6.55E + 06	9.88E + 06
7	CELL DENSITY (cells/ml)		1.25E + 04	2.65E + 05	6.55E + 05	9.88E + 05
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	176	111	18
9	GLUCOSE CONSUMPTION IN (mg/ml)		0	64	129	222
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	3.20E + 08	6.45E + 08	1.11E + 09
11	VIABILITY		100%	100%	100%	98%
12	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT		1.25E + 07	2.65E + 08	6.55E + 08	9.88E + 08

Fig. 17E

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	6.25E + 04				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME (ml)		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		6.25E + 04	4.00E + 05	1.24E + 06	1.63E + 06
7	CELL DENSITY (cells/ml)		6.25E + 03	4.00E + 04	1.24E + 05	1.63E + 05
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	232	202	184
9	GLUCOSE CONSUMPTION IN (mg/ml)		0	8	38	56
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	4.00E + 07	1.90E + 08	2.80E + 08
11	VIABILITY		100%	100%	100%	100%
12	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT		6.25E + 06	4.00E + 07	1.24E + 08	1.63E + 08

Fig. 18

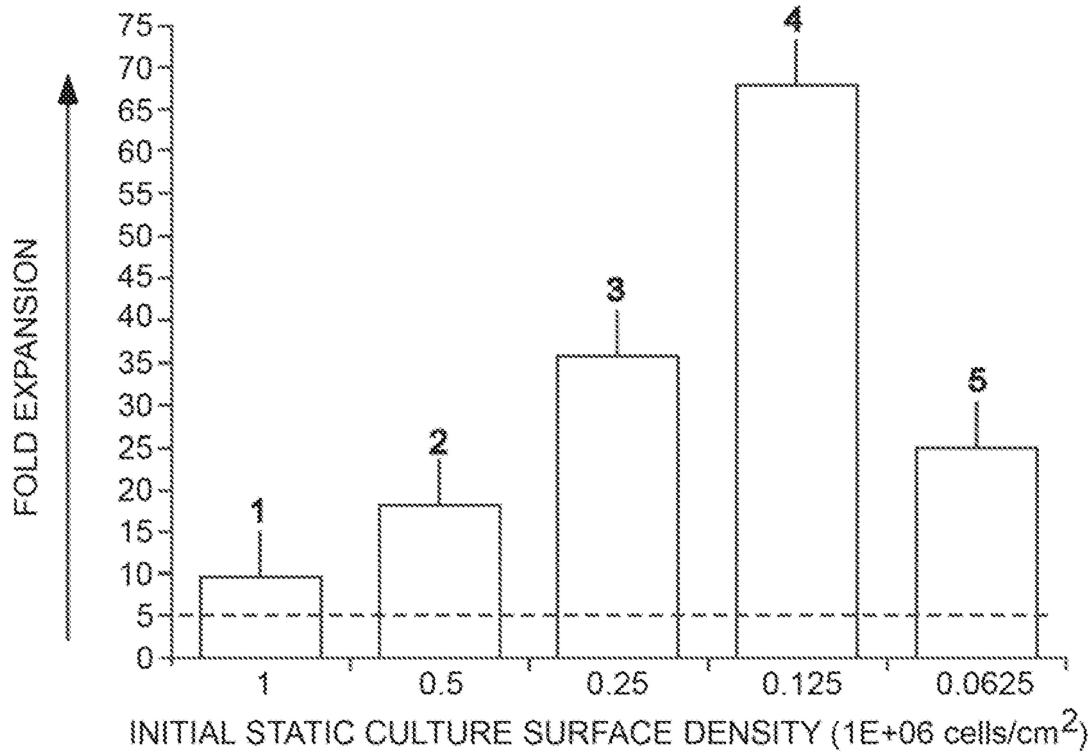

FOLD EXPANSION
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
1
0.5
0.25
0.125
0.0625
INITIAL STATIC CULTURE SURFACE DENSITY (1E+06 cells/cm2)

Fig. 19A

ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	1.25E + 05				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME IN ml		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (mls/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		1.25E + 05	2.65E + 06	6.55E + 06	9.88E + 06
7	CELL DENSITY (cells/ml)		1.25E + 04	2.65E + 05	6.55E + 05	9.88E + 05
8	GLUCOSE CONCENTRATION (mg/dl)	240	240	176	111	18
9	GLUCOSE CONSUMPTION (mg/ml)		0	64	129	222
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	3.00E + 08	6.19E + 08	1.07E + 09
11	VIABILITY		100%	100%	100%	98%
12	TOTAL LIVE CELLS		1.25E + 07	2.65E + 08	6.55E + 08	9.88E + 08
ROW			DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2)	1.25E + 05				
2	SURFACE AREA OF GROWTH SURFACE (cm^2)		100	100	100	100
3	MEDIUM VOLUME IN ml		1000	1000	1000	1000
4	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (mls/cm^2)		10	10	10	10
5	MEDIA HEIGHT (cm)		10	10	10	10
6	SURFACE DENSITY (cells/cm^2)		1.25E + 05	5.13E + 06	9.26E + 06	1.05E + 07
7	CELL DENSITY (cells/ml)		1.25E + 04	5.13E + 05	9.26E + 05	1.05E + 06
8	GLUCOSE CONCENTRATION (mg/dl)	475	475	374	287	256
9	GLUCOSE CONSUMPTION (mg/ml)		0	107	193	219
10	PREDICTED CELL NUMBER BY USE OF GLUCOSE		0.00E + 00	5.13E + 08	9.20E + 08	1.00E + 09
11	VIABILITY		100%	100%	100%	98%
12	TOTAL LIVE CELLS		1.25E + 07	5.13E + 08	9.26E + 08	1.05E + 09

Fig. 19B

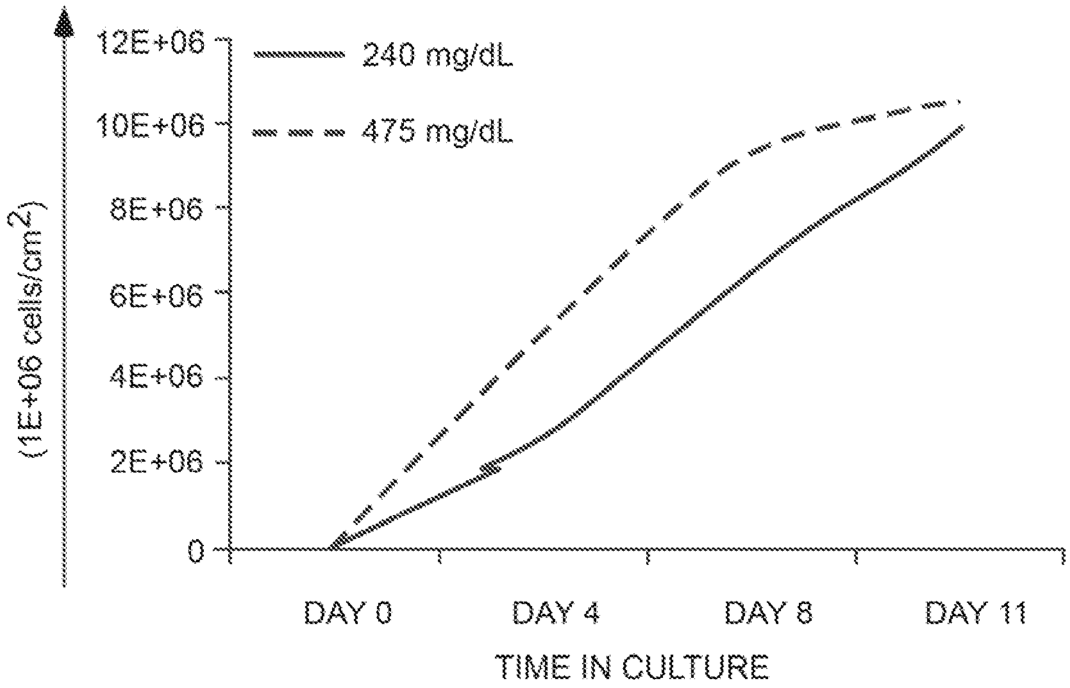

12E+06
10E+06
8E+06
6E+06
4E+06
2E+06
0
(1E+06 cells/cm2)
240 mg/dL
475 mg/dL
DAY 0
DAY 4
DAY 8
DAY 11
TIME IN CULTURE

Fig. 19C

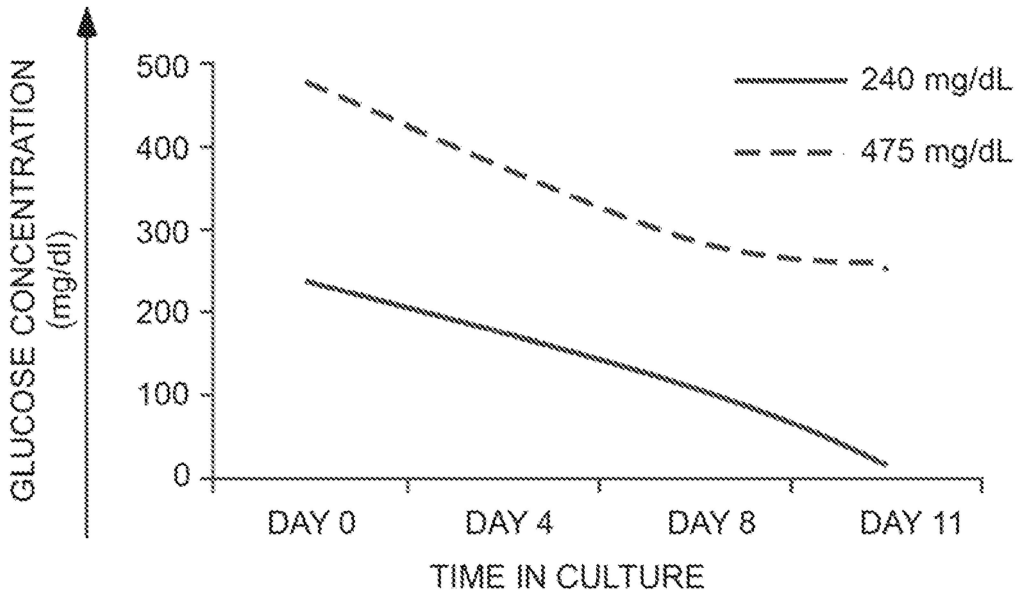


Fig. 19D

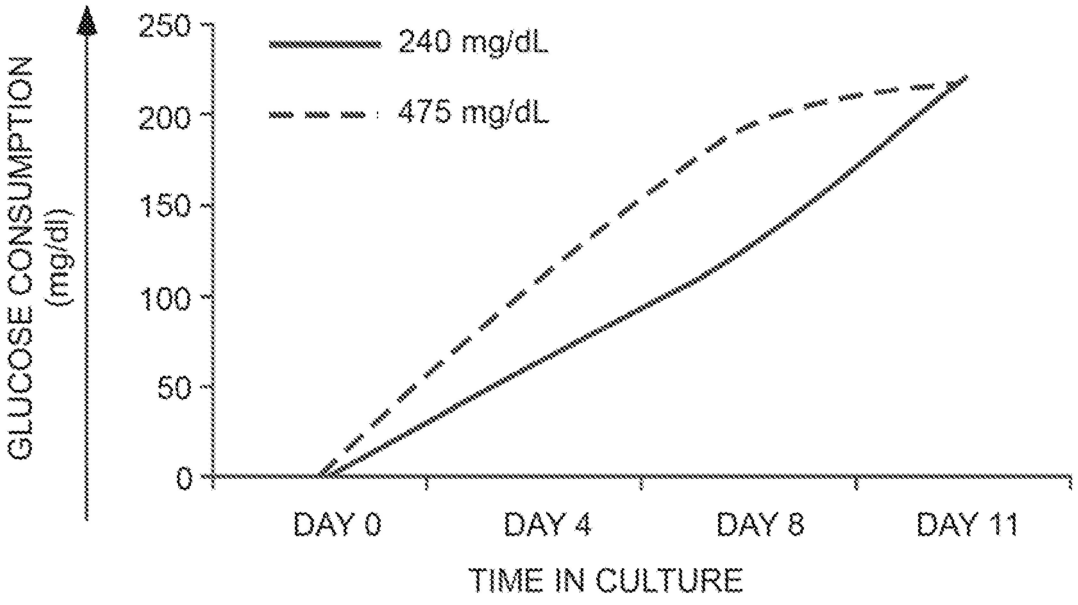


Fig. 19E

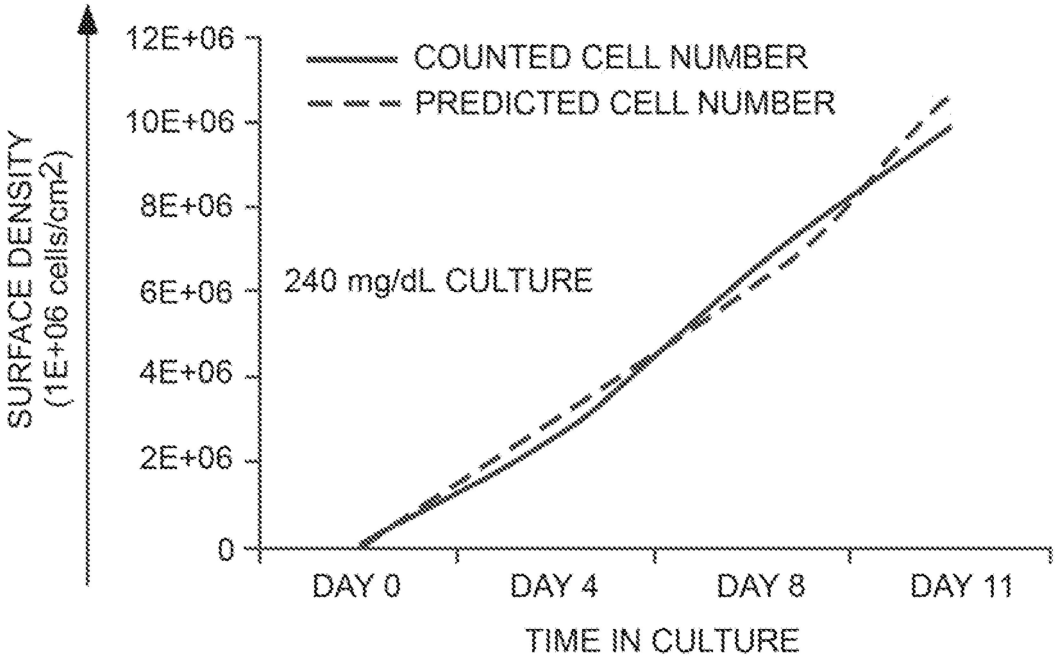


Fig. 19F

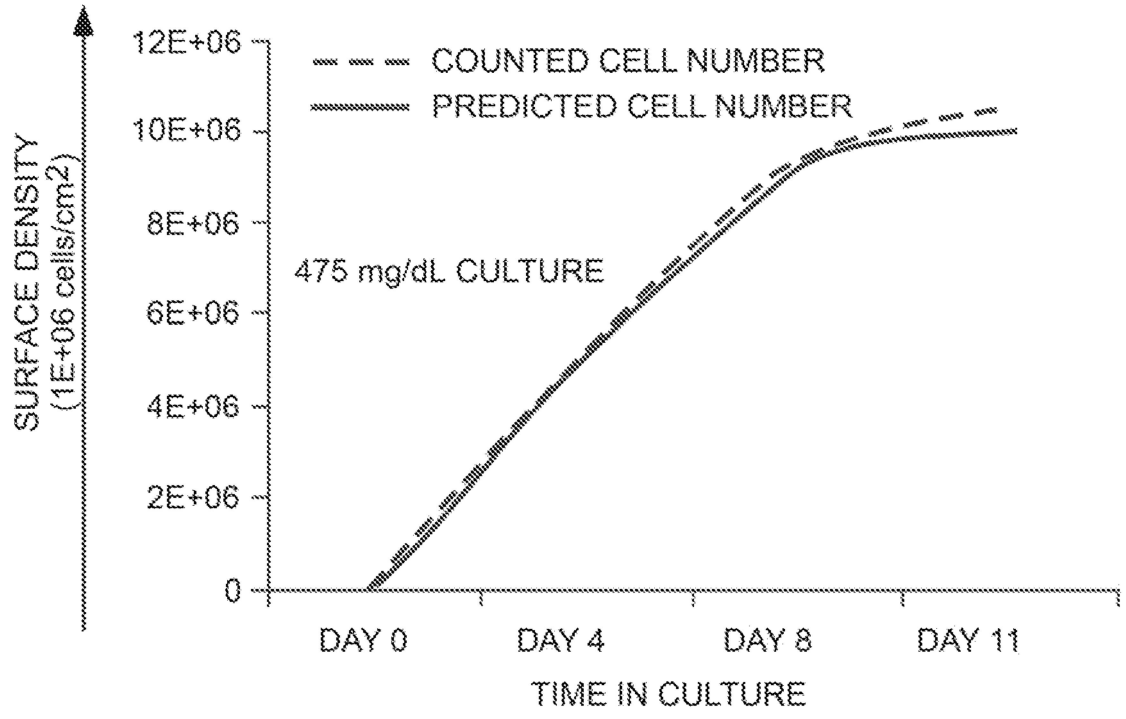


Fig. 20

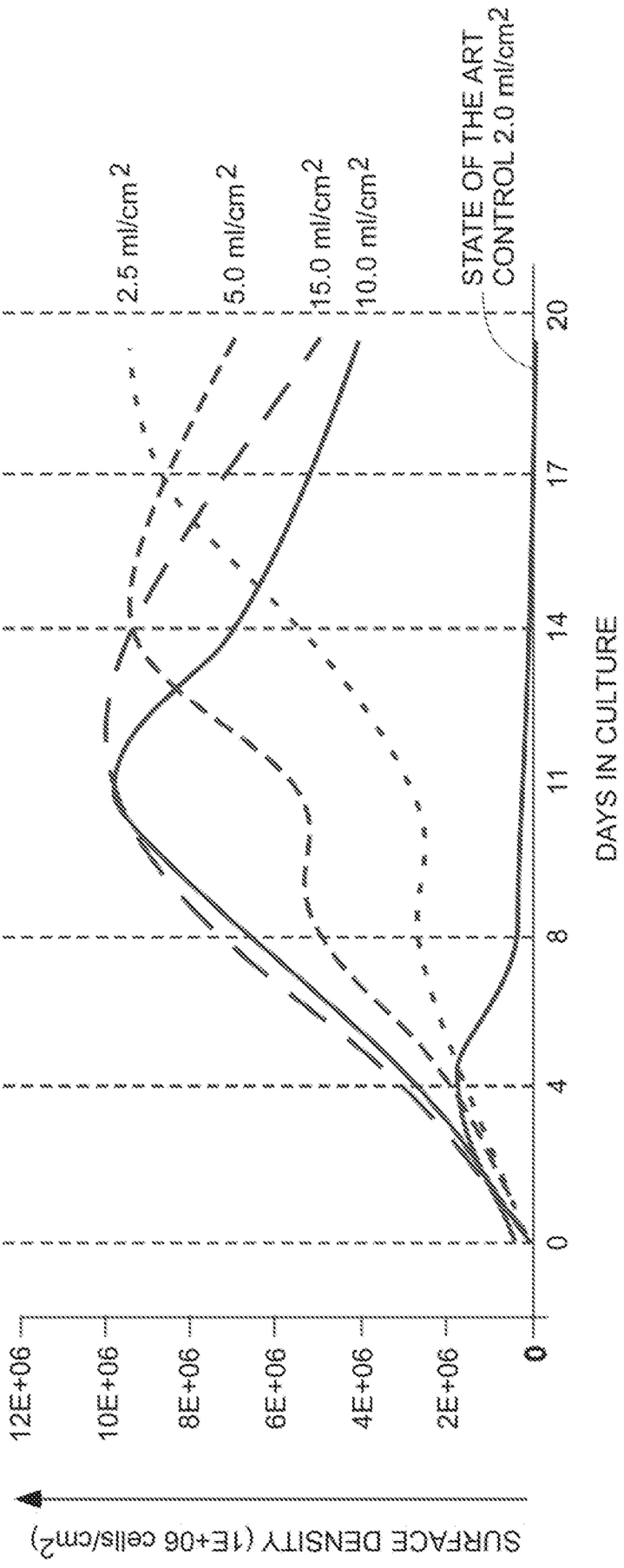

SURFACE DENSITY (1E+06 cells/cm²)
12E+06
10E+06
8E+06
6E+06
4E+06
2E+06
0
0
4
8
11
14
17
20
DAYS IN CULTURE
2.5 ml/cm 2
5.0 ml/cm 2
15.0 ml/cm2
10.0 ml/cm2
STATE OF THE ART
CONTROL 2.0 ml/cm2

Fig. 21

	CMV-CTL POPULATION EXPANSION			
ROW		DAY 0	DAY 9	DAY 16
1	SURFACE DENSITY OF PBMCs AT CULTURE ONSET (cells/cm2)	5.00E+05		
2	SURFACE DENSITY OF CELL COMPOSTION (cells/cm2)	5.00E+05	1.32E+06	2.21E+08
3	PERCENTAGE OF ANTIGEN SPECIFIC T CELLS IN THE CELL COMPOSITION (%)	0.8	27.9	48.7
4	ENRICHMENT OF ANTIGEN SPECIFIC T CELLS (CMV SPECIFIC T CELLS)	0	34.88	1.75
5	PERCENTAGE OF NON SPECIFIC T CELLS IN THE CELL COMPOSITION	99.2	72.1	51.3
6	TOTAL NUMBER OF CELLS IN CULTURE	5.00E+07	1.32E+08	2.21E+10
7	FOLD INCREASE IN CELL COMPOSITION POPULATION EXPANSION	0	2.64E+00	442
8	FOLD INCREASE IN CELL IN CMV SPECIFIC POPULATION	0	69.7	69.8
9	AREA OF GROWTH SURFACE (cm2)	100	100	100
10	MEDIUM VOLUME (ml)	1000	1000	1000
11	MEDIA HEIGHT (cm2)	10	10	10
12	CELL DENSITY (cells/ml)	5.00E+04	1.32E+05	2.21E+07
13	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm2)	10	10	10
14	GLUCOSE CONCENTRATION	240	110	19
15	GLUCOSE CONSUMPTION	0	130	221
16	PREDICTED CELL NUMBER BY USE OF GLUCOSE	0	1.30E+08	2.21E+08
18	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT	5.00E+07	1.32E+08	2.21E+08
19	PERCENTAGE DIFFERENCE BETWEEN PREDICTED POP. AND HEMOCYTOMETER COUNTS		1.54%	0.00%

Fig. 22A

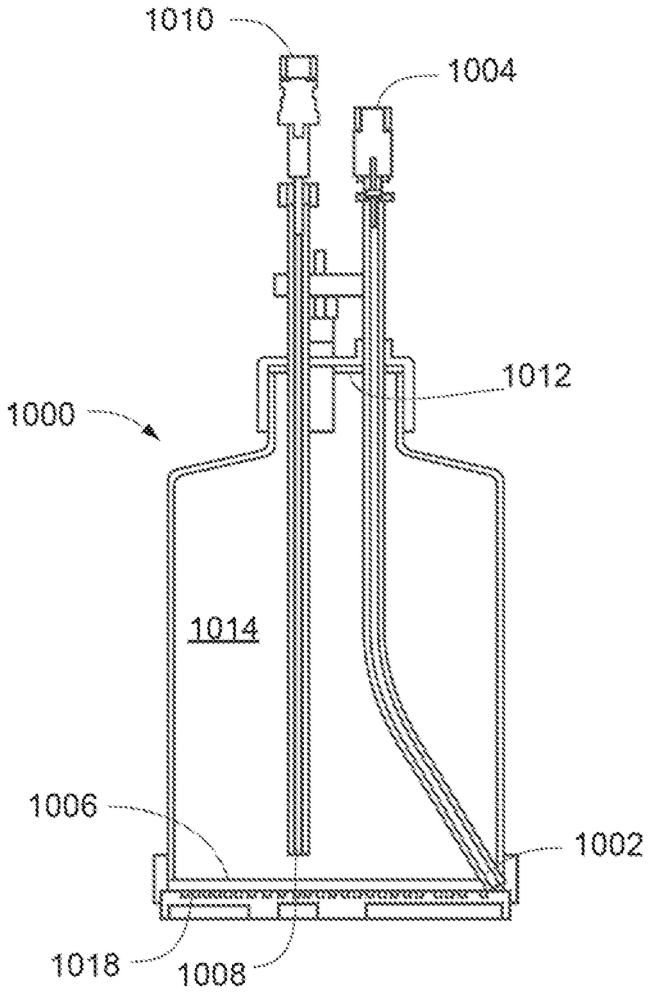


Fig. 22B

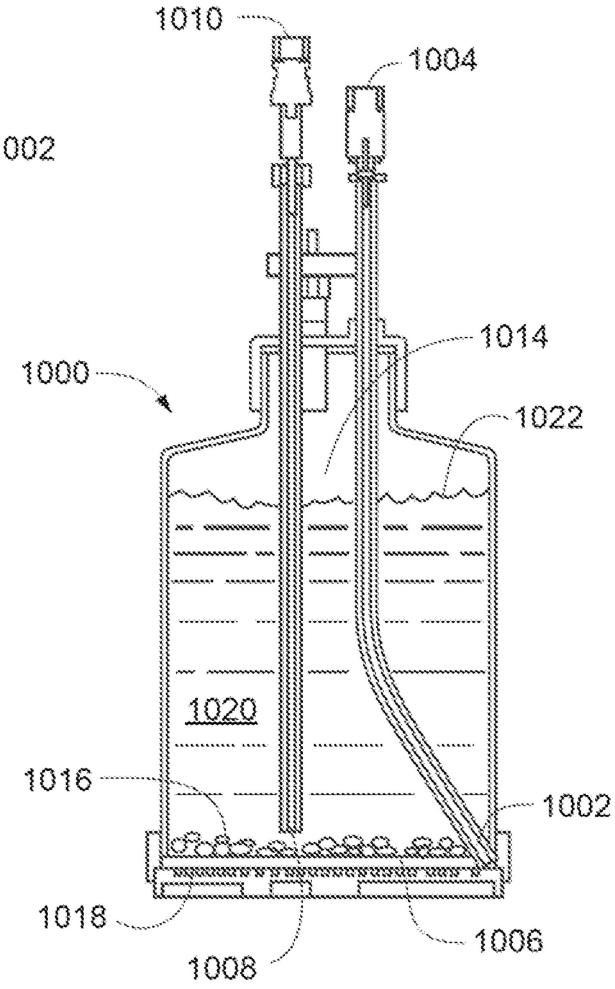


Fig. 22C

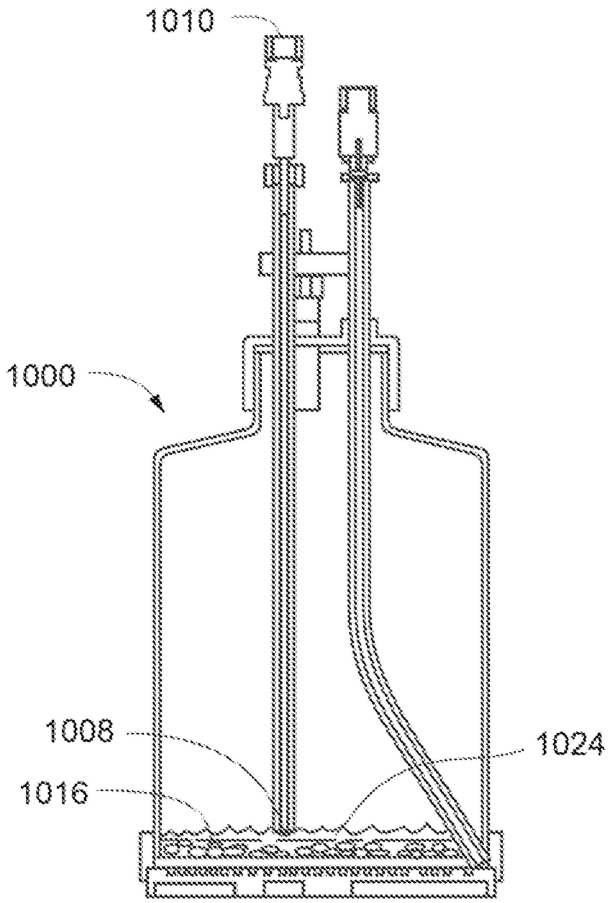


Fig. 22D

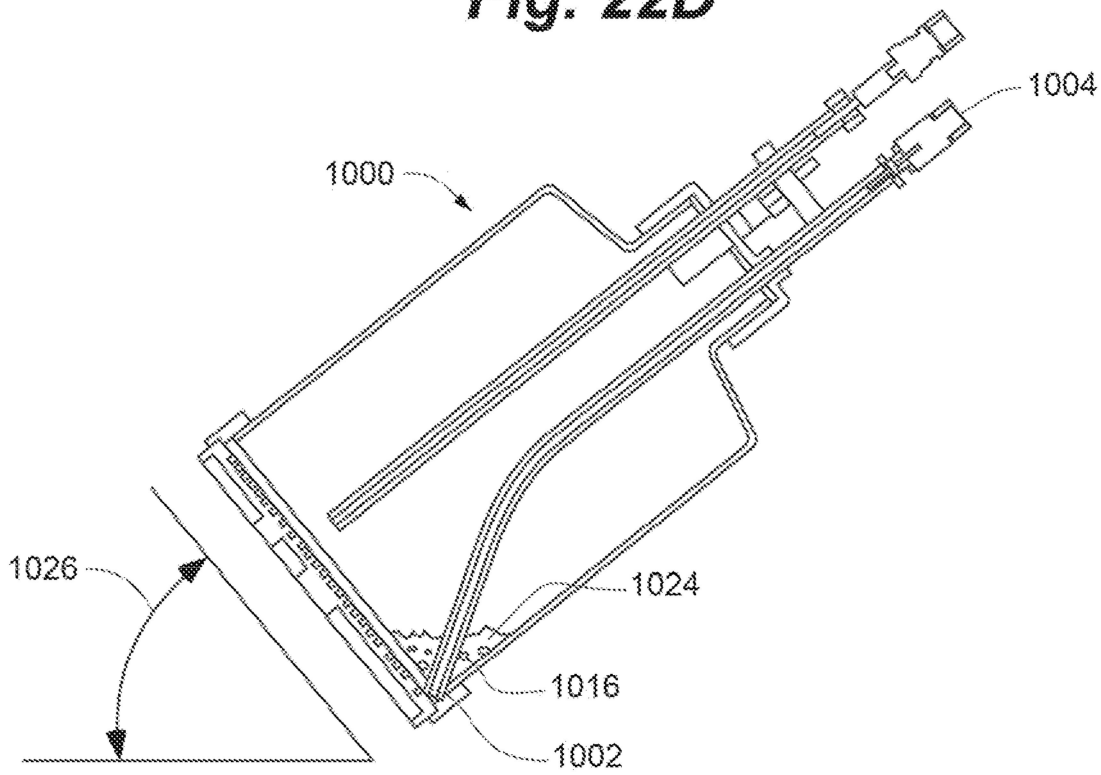


Fig. 23A

ROW	EVALUATION A	DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF CAR T CELLS	2.50E+05			
2	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF APC (K562-PSCA/CD80/41BB)	5.00E+05	1.00E+04	0.00E+00	0.00E+00
3	TOTAL SURFACE DENSITY ON DAY 0 (cells/cm^2)	7.50E+05			
4	SURFACE AREA OF GROWTH SURFACE (cm^2)	100	100	100	100
5	MEDIUM VOLUME (ml)	1000	1000	1000	1000
6	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)	10	10	10	10
7	MEDIA HEIGHT (cm)	10	10	10	10
8	SURFACE DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+05	1.10E+06	1.80E+07	2.46E+07
9	CELL DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+04	1.10E+05	1.80E+06	2.46E+06
10	GLUCOSE CONCENTRATION (mg/dl)	286	176	106	46
11	GLUCOSE CONSUMPTION IN (mg/dl)	0	-176	-106	-46
12	PREDICTED CELL NUMBER BY USE OF GLUCOSE	0	1.10E+08	1.80E+09	2.40E+09
13	VIABILITY	100	94	100	100
14	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT	2.50E+07	1.10E+08	1.80E+09	2.46E+09
15	TOTAL LIVE CELLS FOLD EXPANSION	0	4.40E+00	7.20E+01	9.84E+01
16	CAR EXPRESSION	40%	42%	68%	80%
17	FOLD EXPANSION OF CAR T CELLS				1.97E+02

Fig. 23B

ROW	EVALUATION B	DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF CAR T CELLS	2.50E+05			
2	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF APC (K562-PSCA/CD80/41BB)	NONE			
3	TOTAL SURFACE DENSITY ON DAY 0 (cells/cm^2)	2.50E+05			
4	SURFACE AREA OF GROWTH SURFACE (cm^2)	100	100	100	100
5	MEDIUM VOLUME (ml)	1000	1000	1000	1000
6	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)	10	10	10	10
7	MEDIA HEIGHT (cm)	10	10	10	10
8	SURFACE DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+05	5.00E+05	2.80E+06	5.40E+06
9	CELL DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+04	5.00E+04	2.80E+05	5.40E+05
10	GLUCOSE CONCENTRATION (mg/dl)	286			
11	GLUCOSE CONSUMPTION IN (mg/dl)				
12	PREDICTED CELL NUMBER BY USE OF GLUCOSE				
13	VIABILITY	100	100	100	100
14	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT	2.50E+07	5.00E+07	2.80E+08	5.40E+08
15	TOTAL LIVE CELLS FOLD EXPANSION	0	2.00E+00	1.12E+01	2.16E+01
16	CAR EXPRESSION	40%	40%	40%	40%
17	FOLD EXPANSION OF CAR T CELLS				2.16E+01

Fig. 23C

ROW	EVALUATION C	DAY 0	DAY 4	DAY 8	DAY 11
1	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF CAR T CELLS	2.50E+05			
2	SURFACE DENSITY ON DAY 0 (cells/cm^2) OF APC (K562-PSCA/CD80/41BB)	5.00E+05	1.00E+04	0.00E+00	0.00E+00
3	TOTAL SURFACE DENSITY ON DAY 0 (cells/cm^2)	7.50E+05			
4	SURFACE AREA OF GROWTH SURFACE (cm^2)	100	100	100	100
5	MEDIUM VOLUME (ml)	200	200	200	200
6	RATIO OF MEDIUM VOLUME TO GROWTH SURFACE AREA (ml/cm^2)	2	2	2	2
7	MEDIA HEIGHT (cm)	2	2	2	2
8	SURFACE DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+05	4.30E+05	3.80E+05	1.80E+05
9	CELL DENSITY OF CAR T CELLS (cells/cm^2)	2.50E+04	4.30E+04	3.80E+04	1.80E+04
10	GLUCOSE CONCENTRATION (mg/dl)	286	46	0	0
11	GLUCOSE CONSUMPTION IN (mg/dl)	0	240	286	286
12	PREDICTED CELL NUMBER BY USE OF GLUCOSE	0	4.80E+07	4.80E+08	4.80E+08
13	VIABILITY	100	94	75	36
14	TOTAL LIVE CELLS AS DETERMINED BY HEMOCYTOMETER COUNT	2.50E+07	4.30E+07	3.80E+07	1.80E+07
15	TOTAL LIVE CELLS FOLD EXPANSION	0	1.72E+00	1.52E+00	7.20E-01
16	CAR EXPRESSION	40%	42%	68%	80%
17	FOLD EXPANSION OF CAR T CELLS				1.44E+00

FIG. 23D

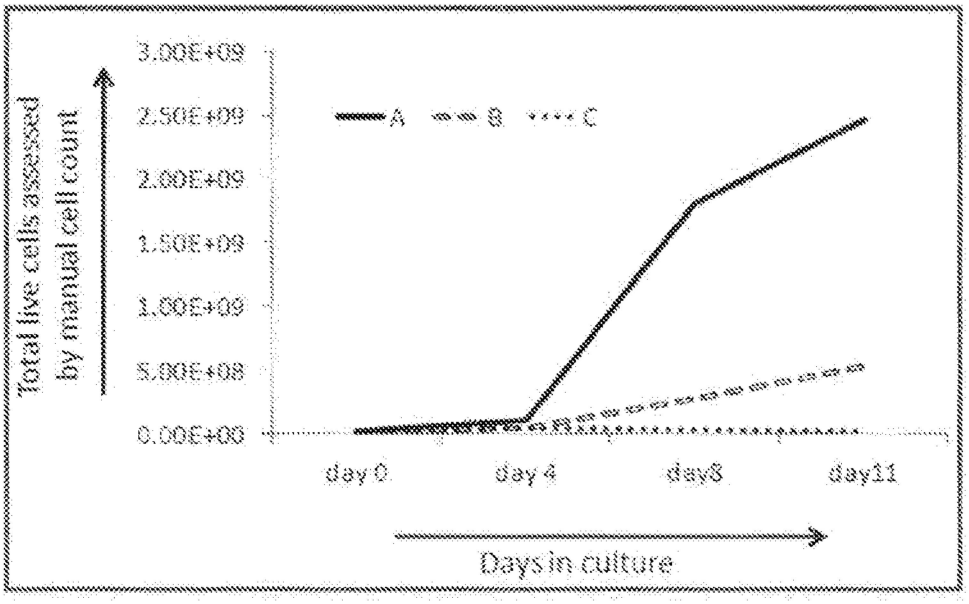


FIG. 23E

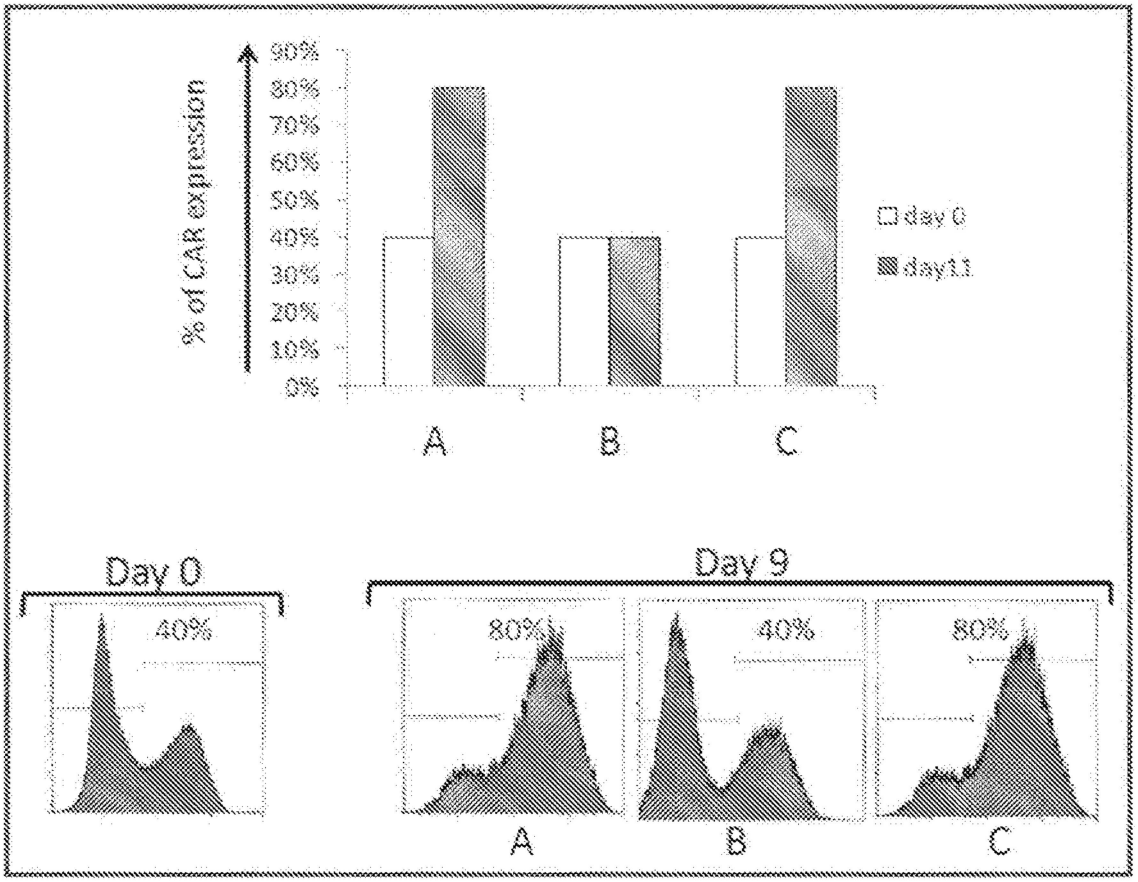


Fig. 23F

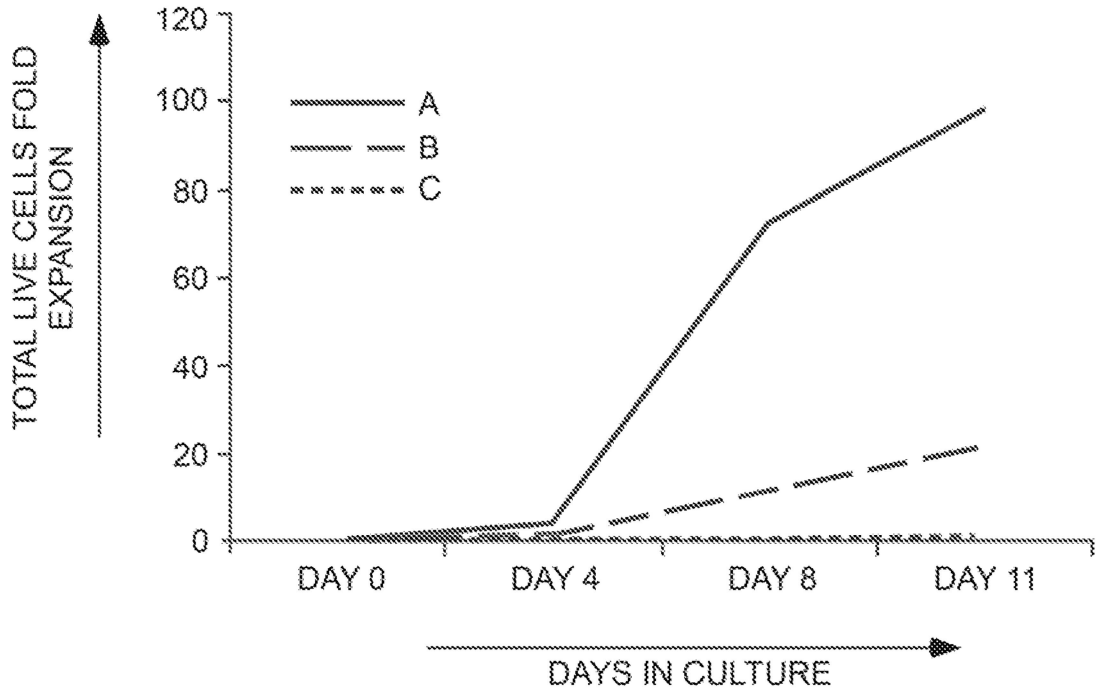


Fig. 23G

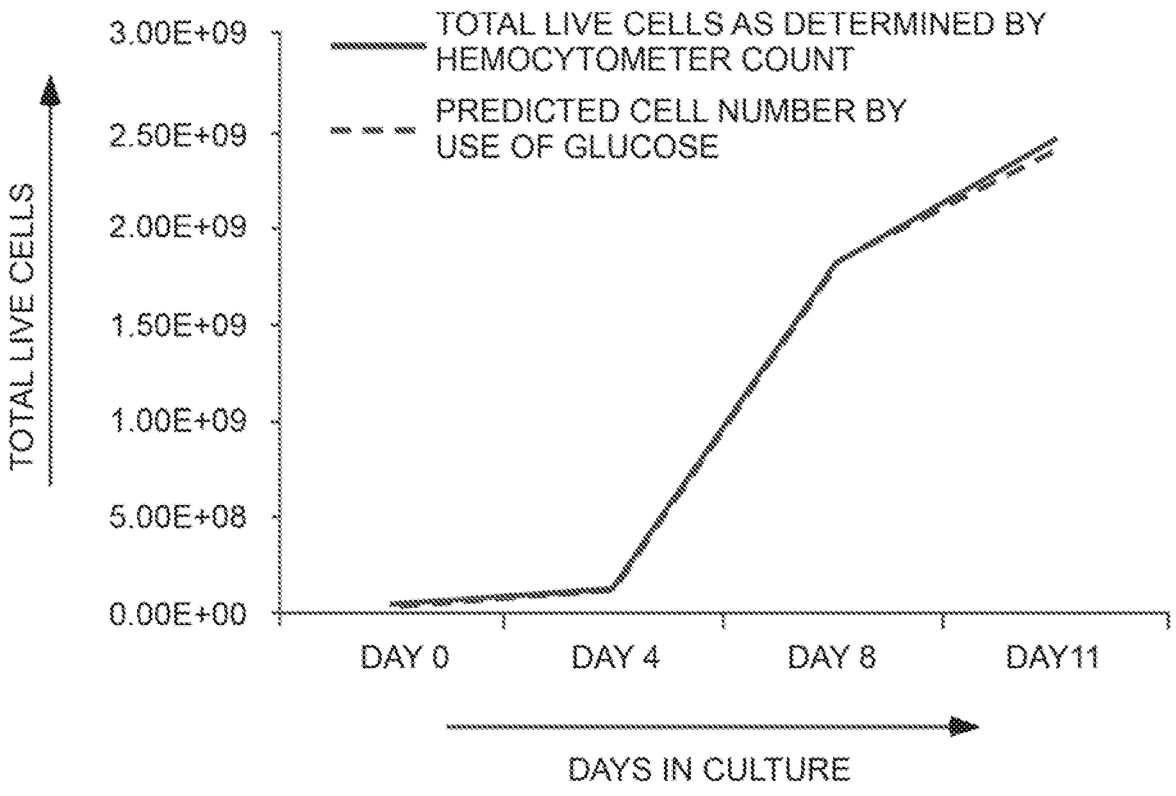


FIG. 23H

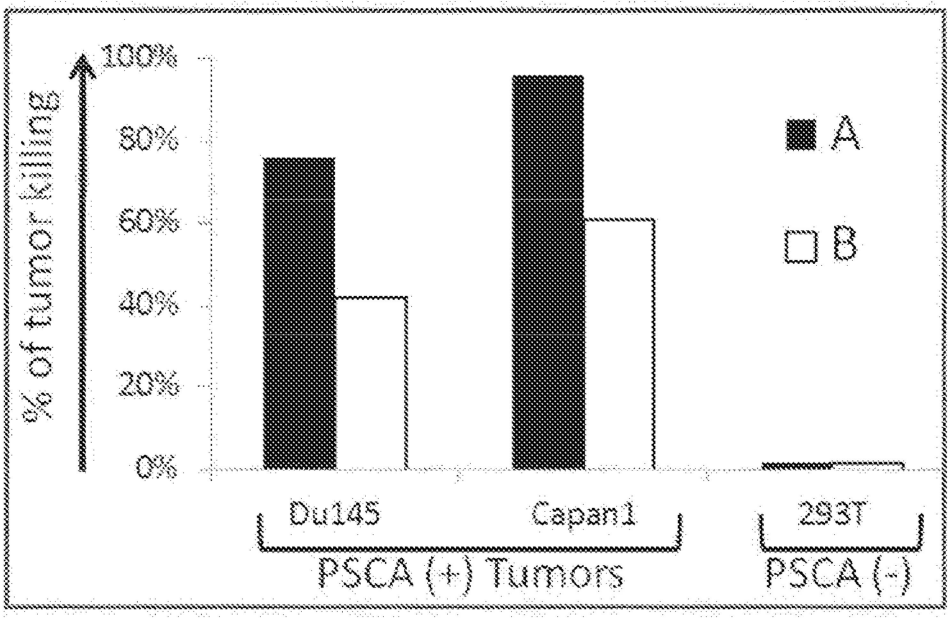


FIG. 24

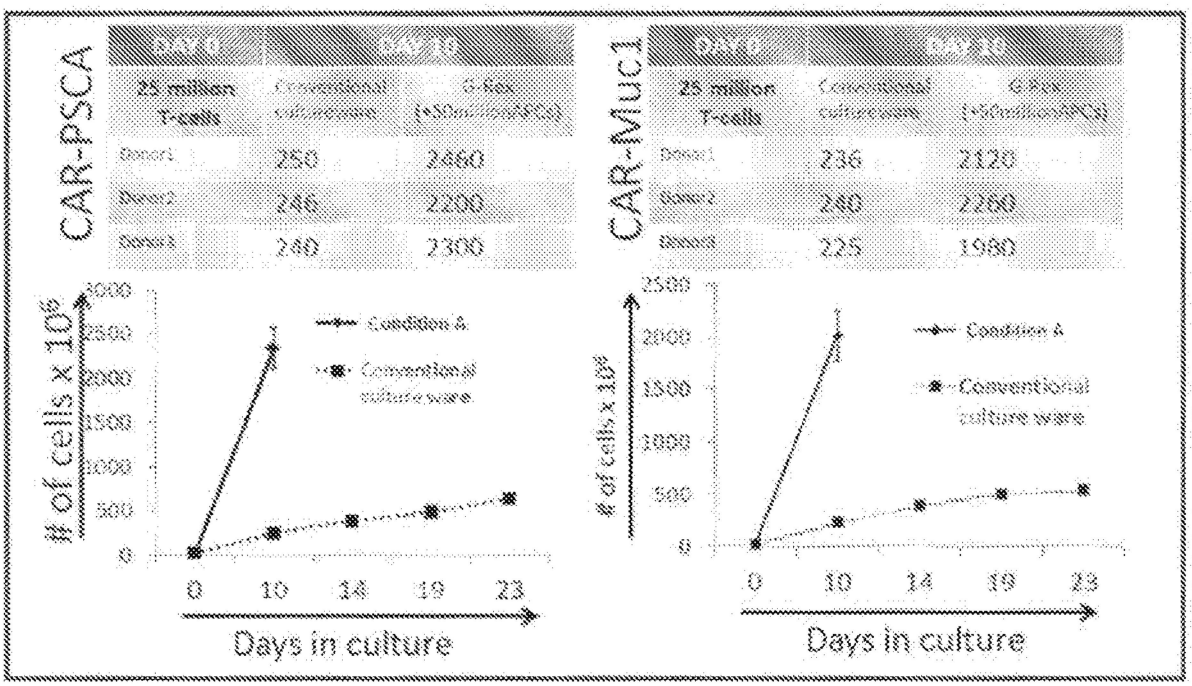


FIG. 24A

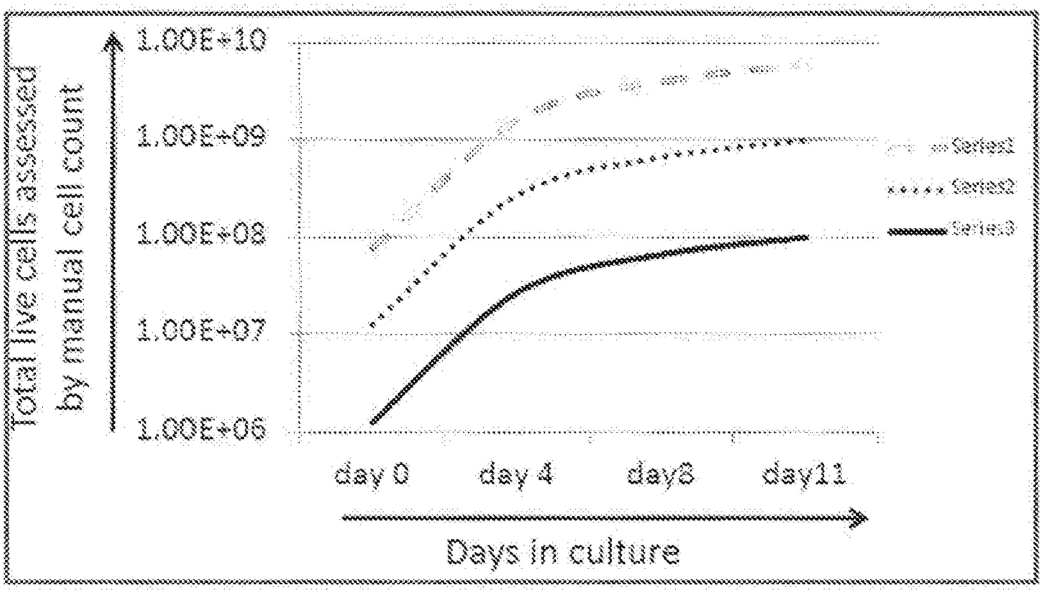


FIG. 24B

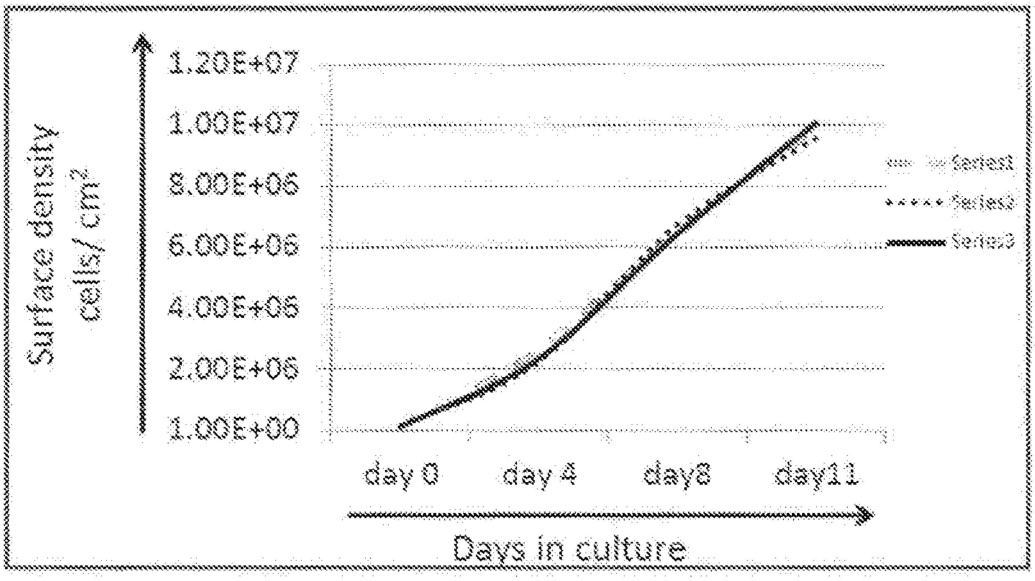


Fig. 24E

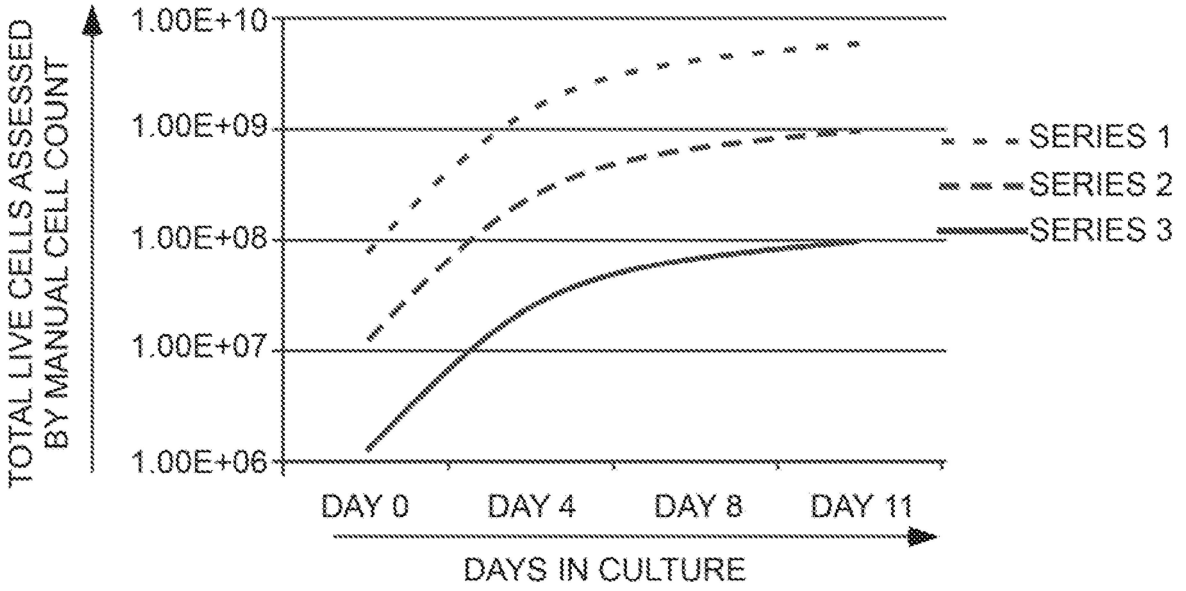


Fig. 24F

