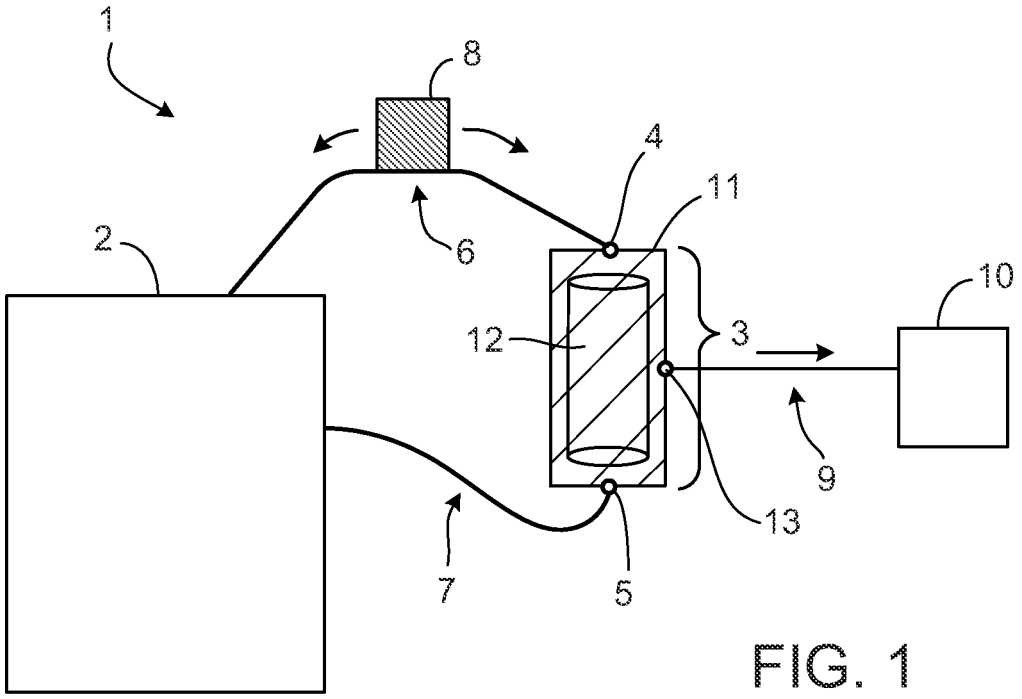


FIG. 1

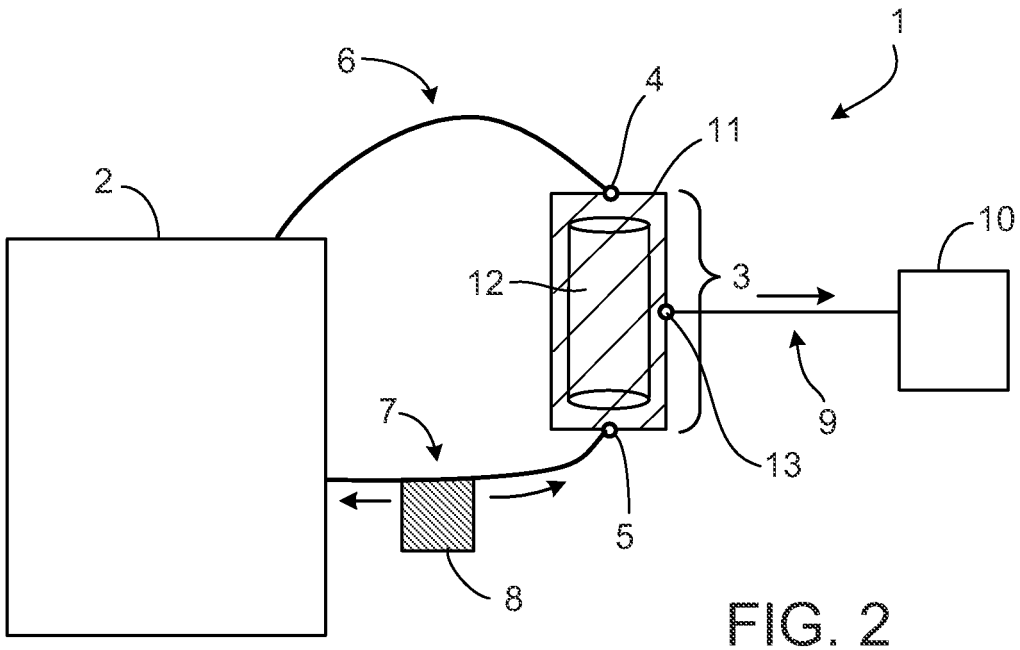


FIG. 2

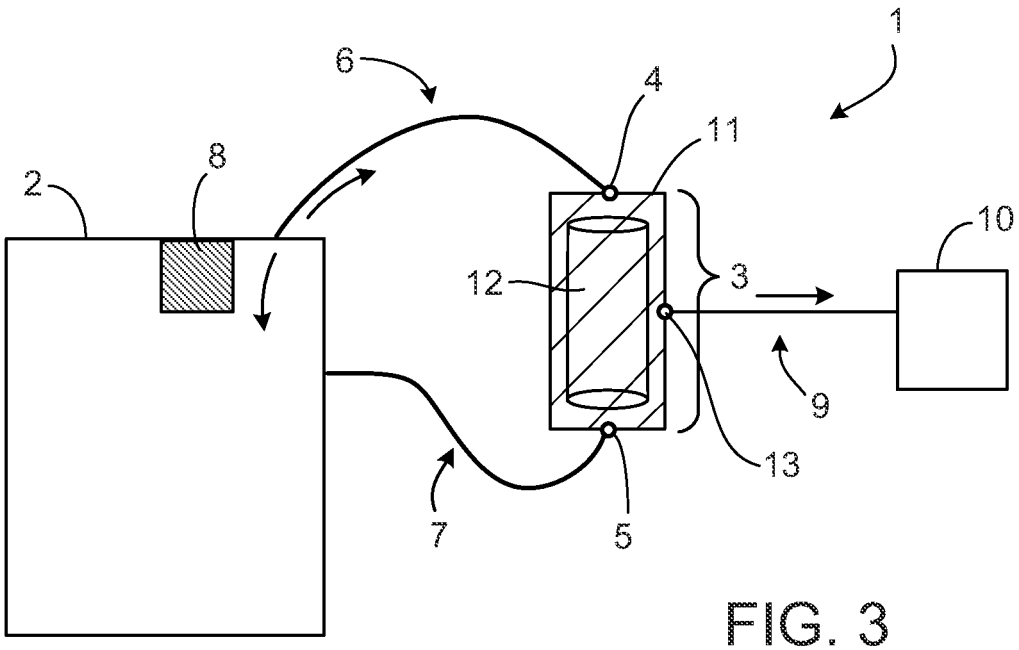

1
6
4
11
2
8
10
12
3
9
13
7
5

FIG. 3

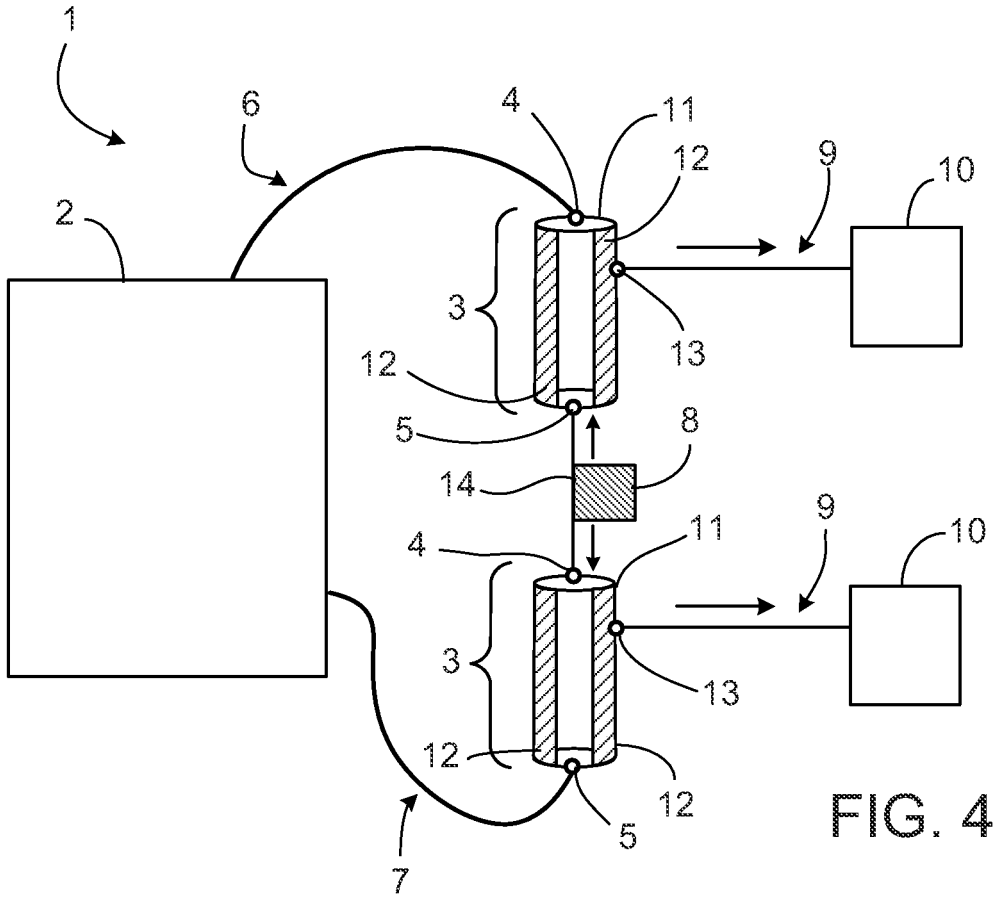

1
6
4
11
12
9
10
2
3
13
12
5
8
14
4
11
9
10
3
13
12
12
5
7

FIG. 4

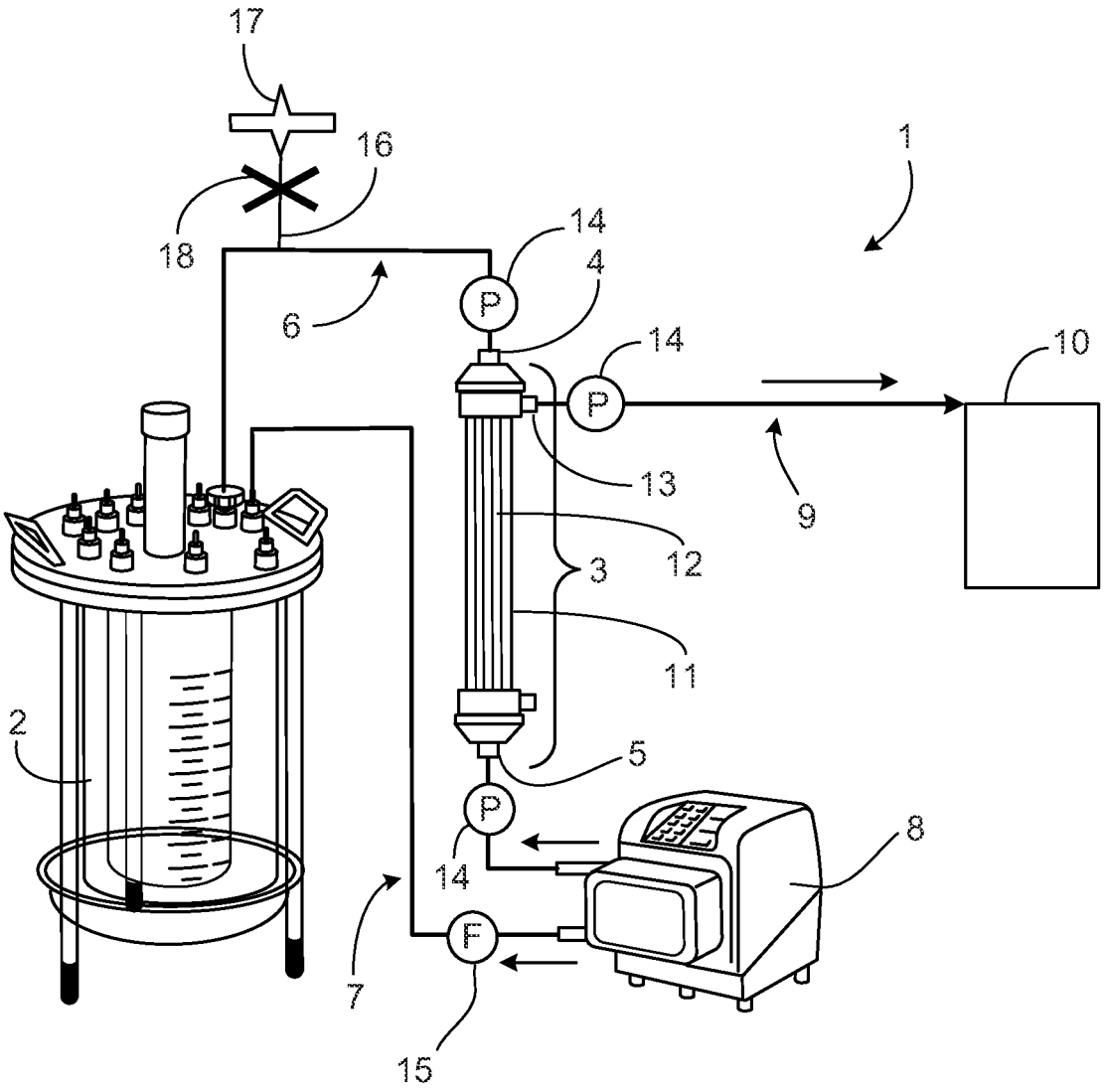


FIG. 5

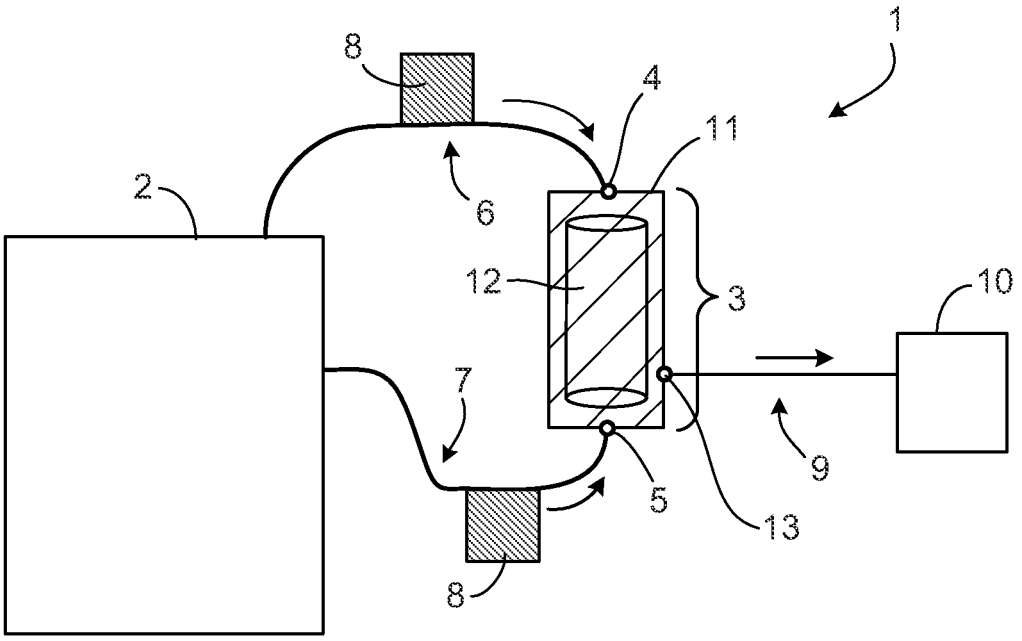


FIG. 6

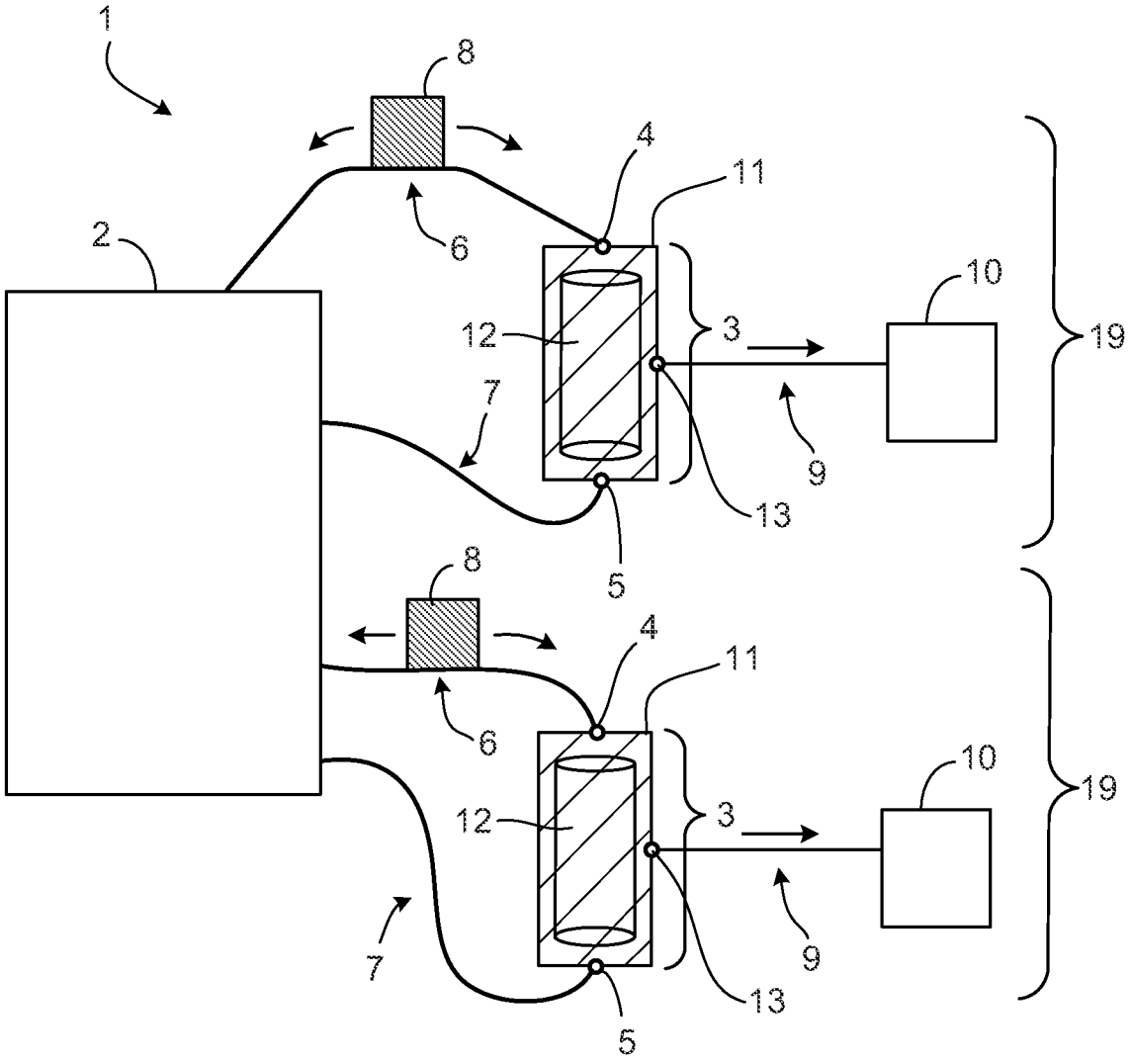


FIG. 7

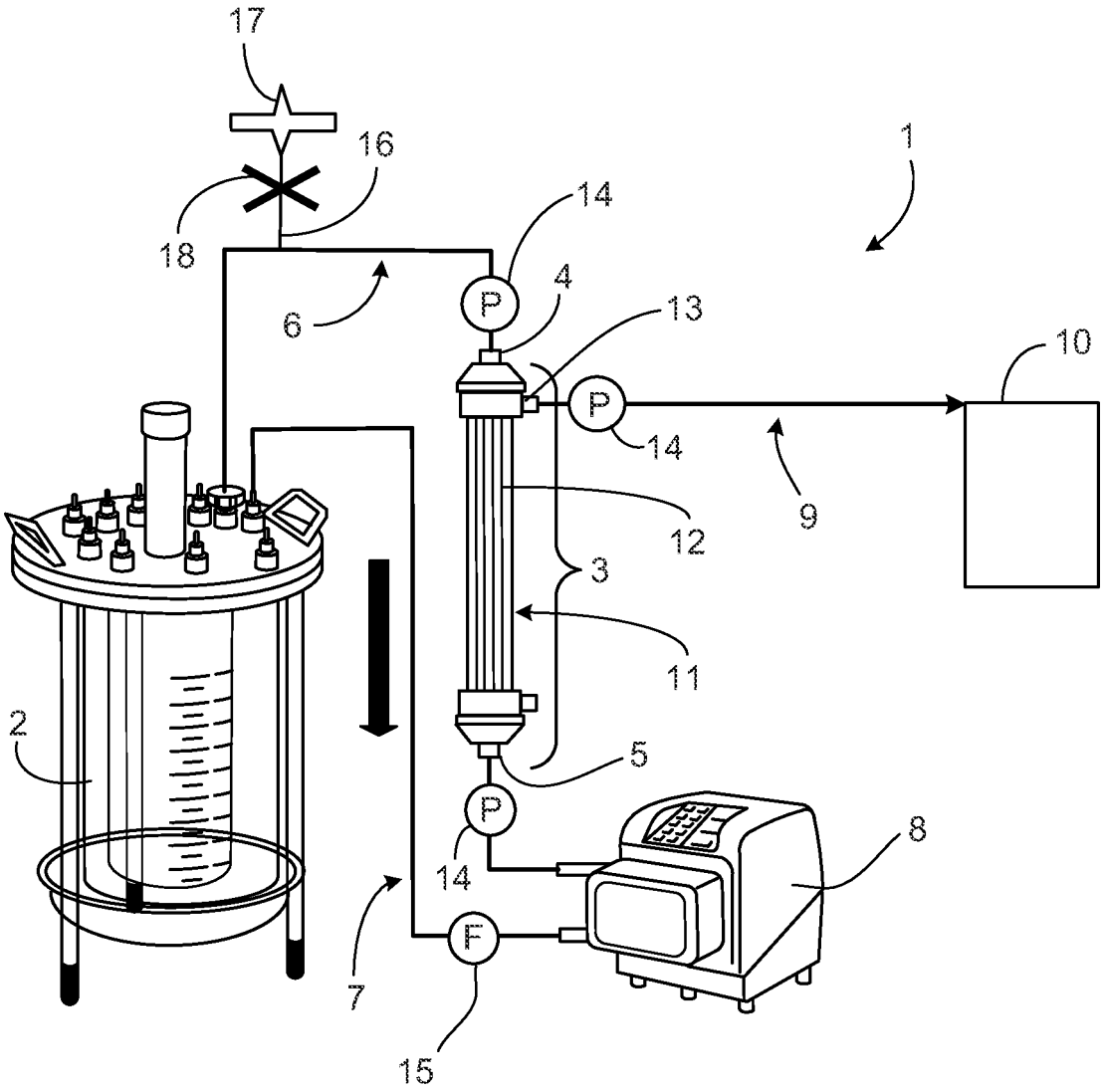


FIG. 8

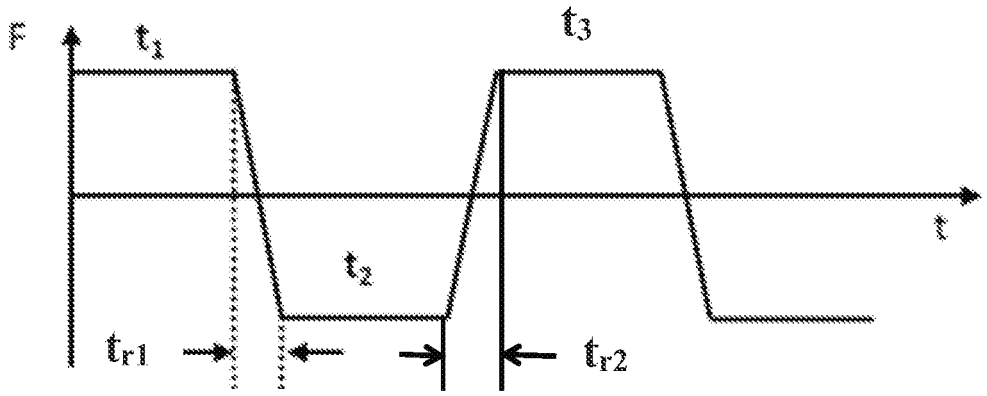

F
t1
t3
t
t2
tr1
tr2

FIG. 9

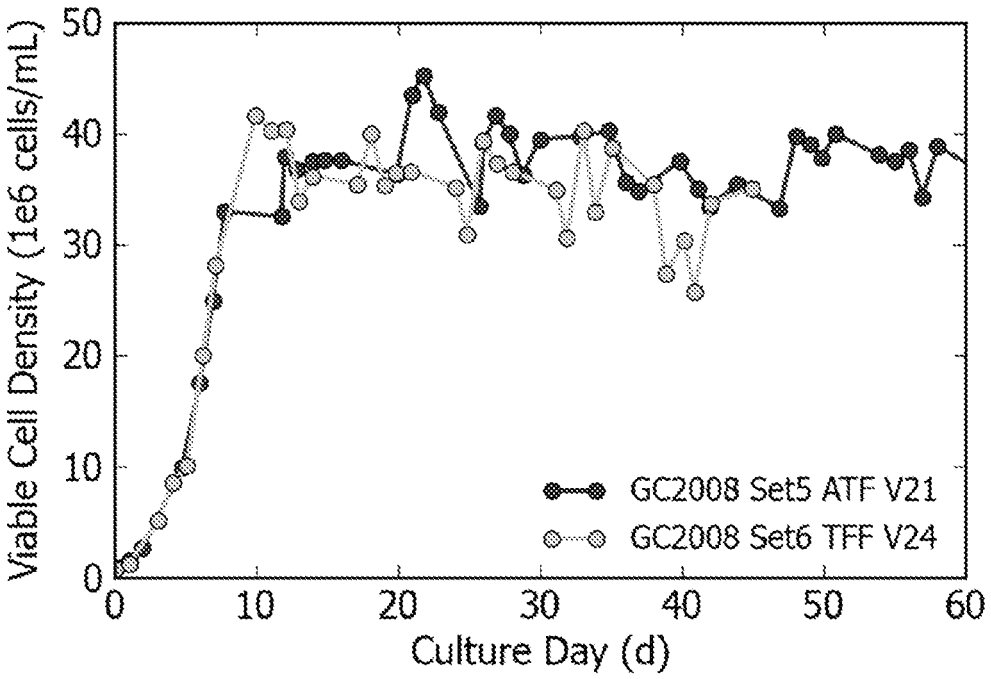

Viable Cell Density (1e6 cells/mL)
0
10
20
30
40
50
0
10
20
30
40
50
60
Culture Day (d)
GC2008 Set5 ATF V21
GC2008 Set6 TFF V24

FIG. 10

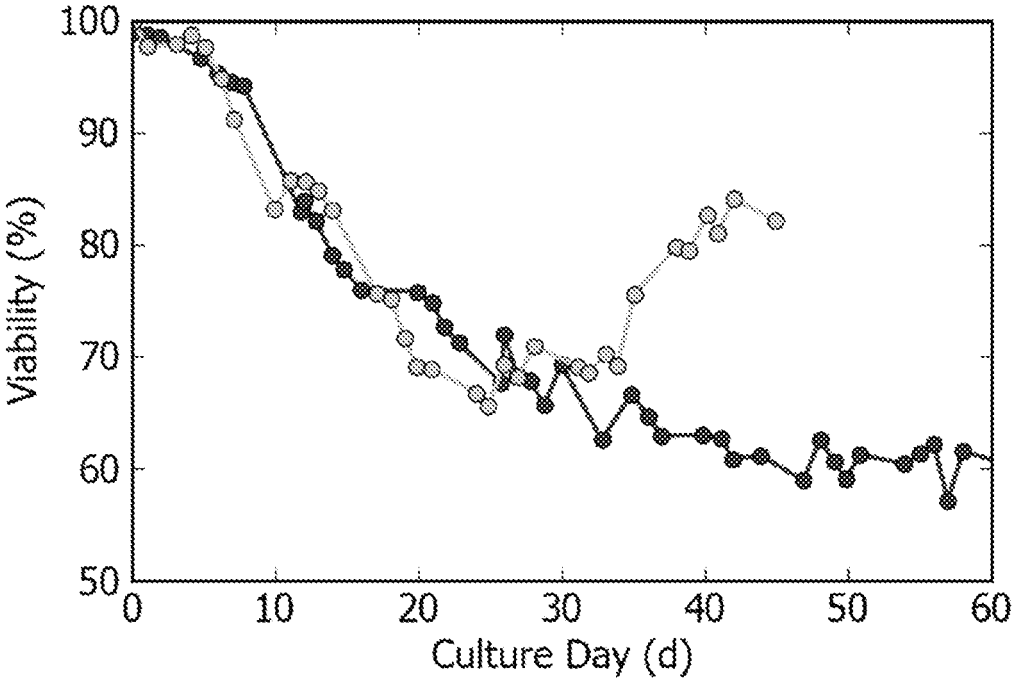

100
90
80
70
60
50
Viability (%)
0
10
20
30
40
50
60
Culture Day (d)

FIG. 11

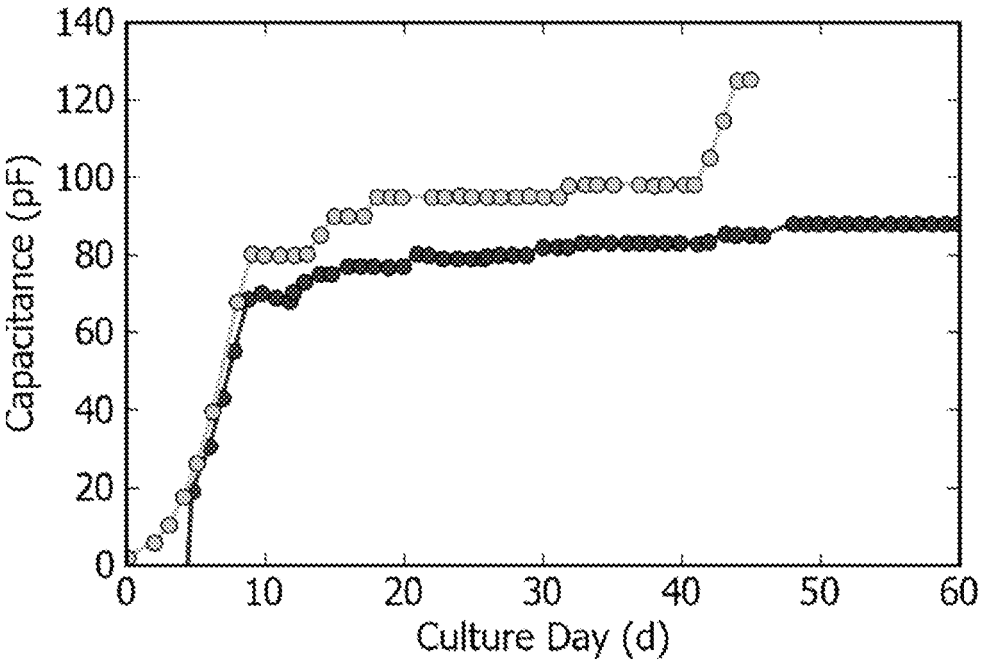

140
120
100
80
60
40
20
0
Capacitance (pF)
0
10
20
30
40
50
60
Culture Day (d)

FIG. 12

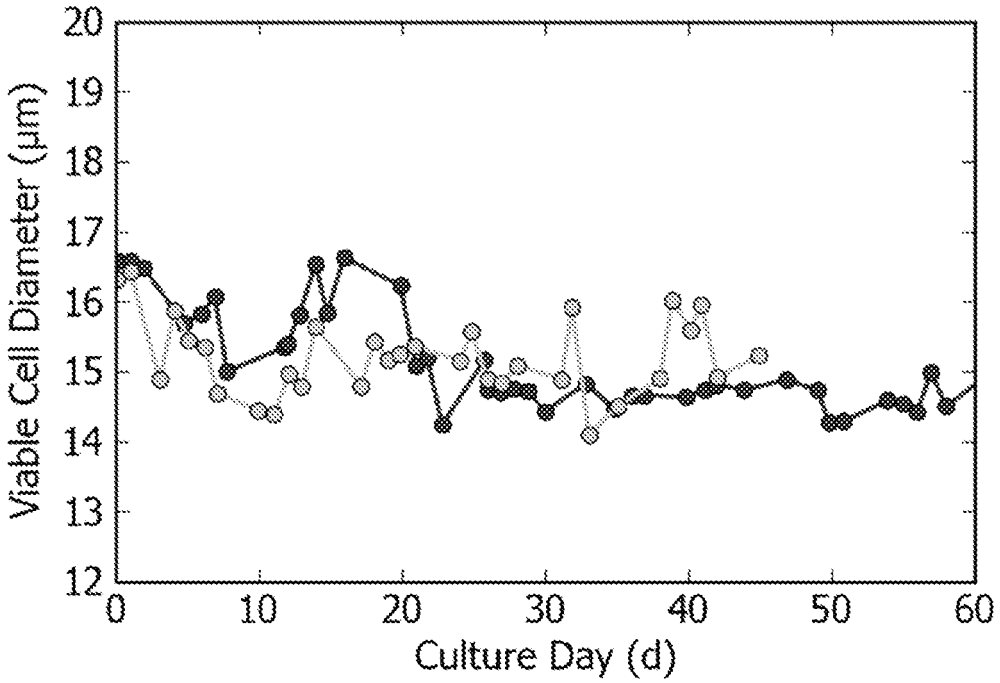

Viable Cell Diameter (µm)
20
19
18
17
16
15
14
13
12
0
10
20
30
40
50
60
Culture Day (d)

FIG. 13

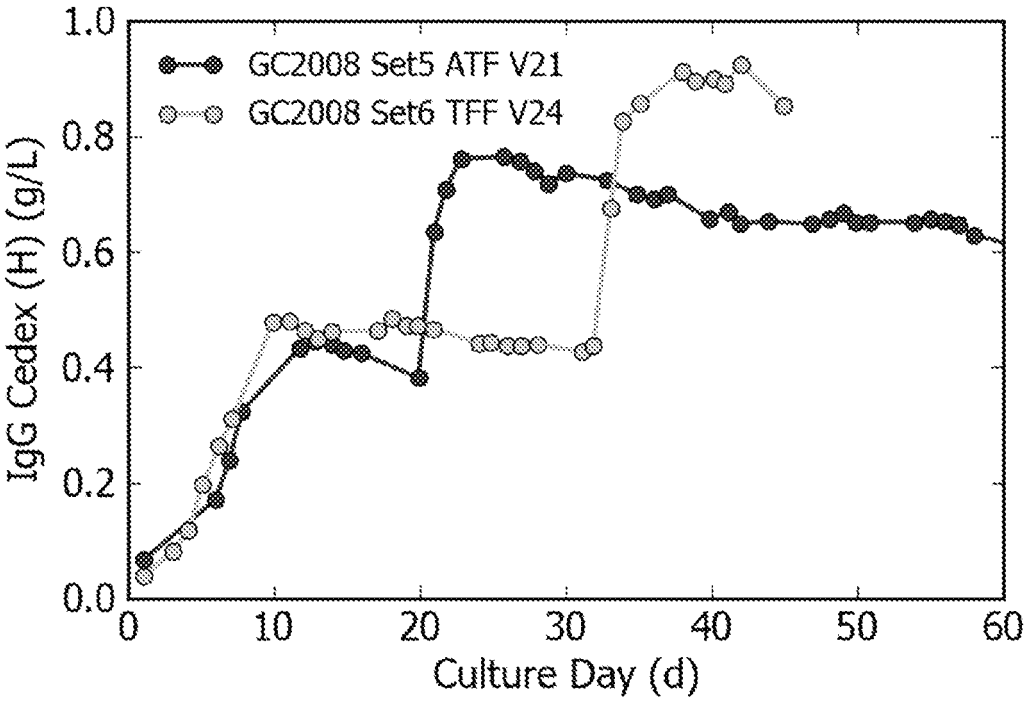

IgG Cedex (H) (g/L)
1.0
0.8
0.6
0.4
0.2
0.0
GC2008 Set5 ATF V21
GC2008 Set6 TFF V24
0
10
20
30
40
50
60
Culture Day (d)

FIG. 14

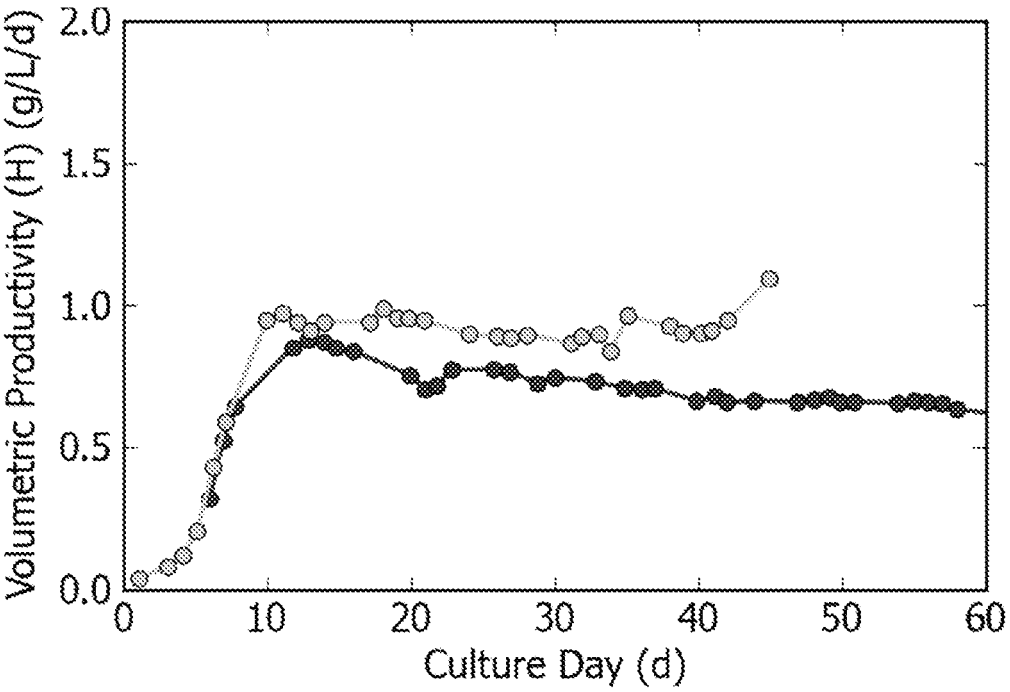

Volumetric Productivity (H) (g/L/d)
2.0
1.5
1.0
0.5
0.0
0
10
20
30
40
50
60
Culture Day (d)

FIG. 15

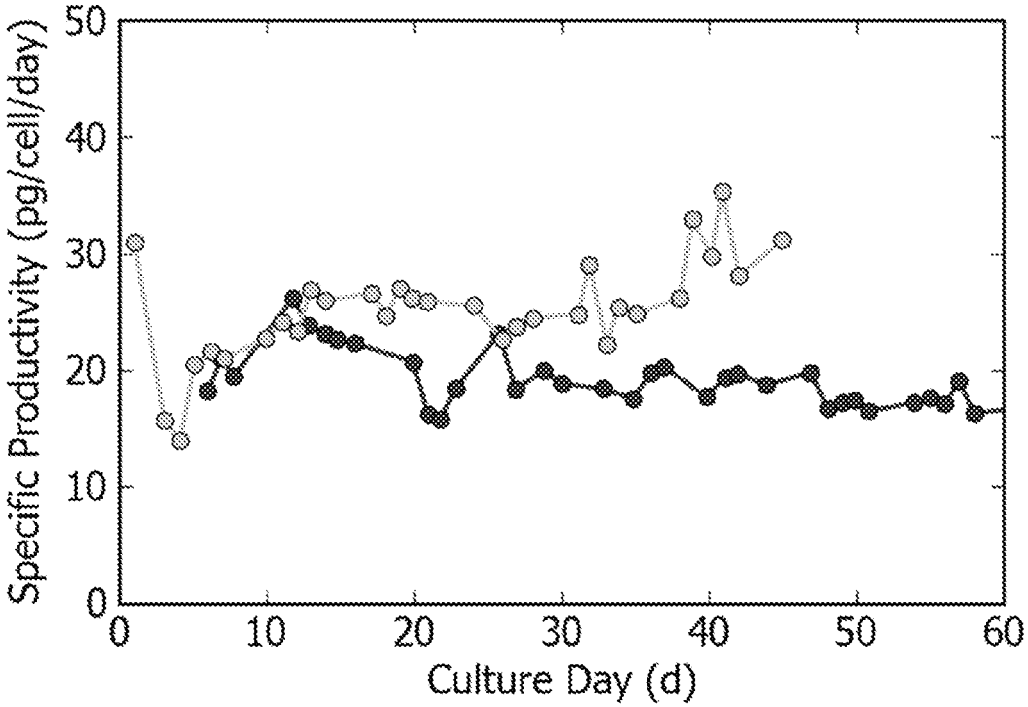

Specific Productivity (pg/cell/day)
50
40
30
20
10
0
0
10
20
30
40
50
60
Culture Day (d)

FIG. 16

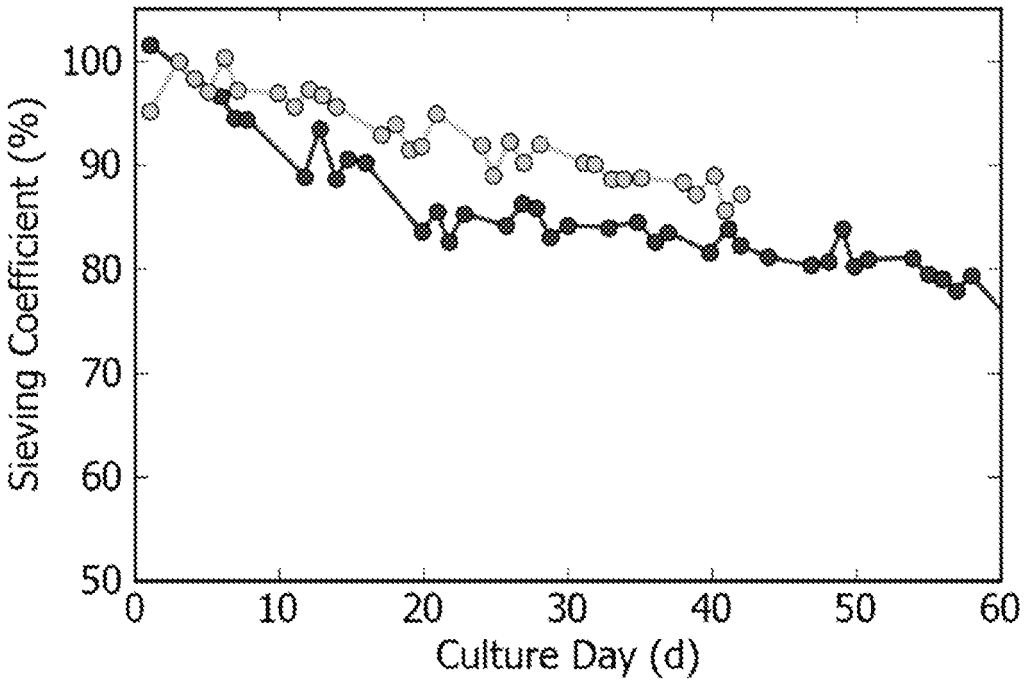

Sieving Coefficient (%)
100
90
80
70
60
50
0
10
20
30
40
50
60
Culture Day (d)

FIG. 17

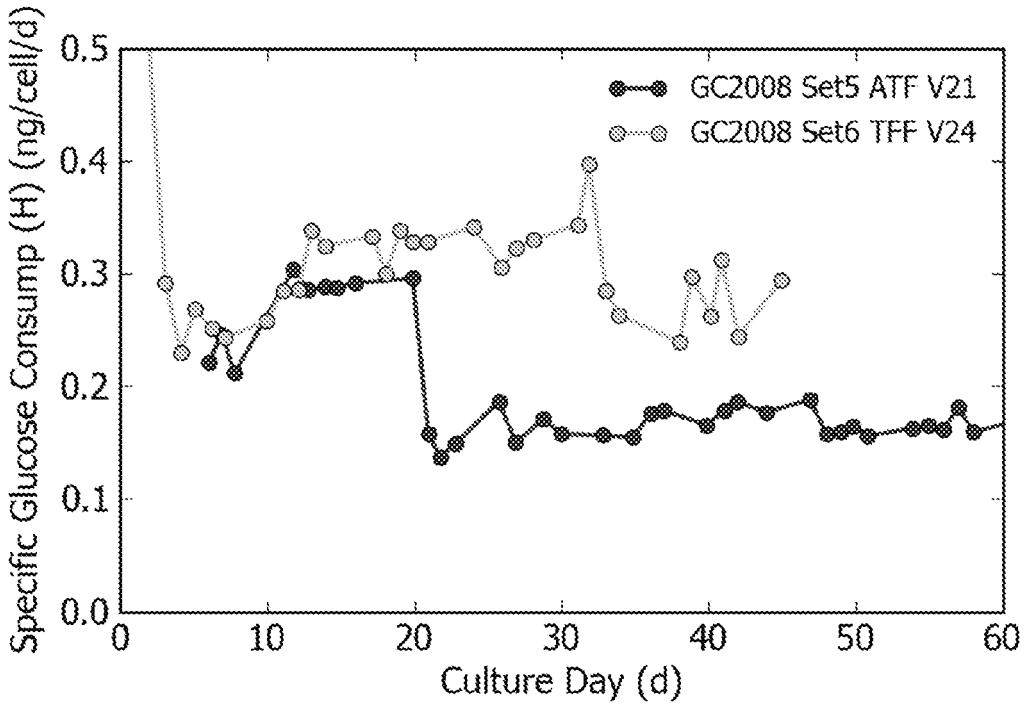

Specific Glucose Consump (H) (ng/cell/d)
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
50
60
Culture Day (d)
GC2008 Set5 ATF V21
GC2008 Set6 TFF V24

FIG. 18

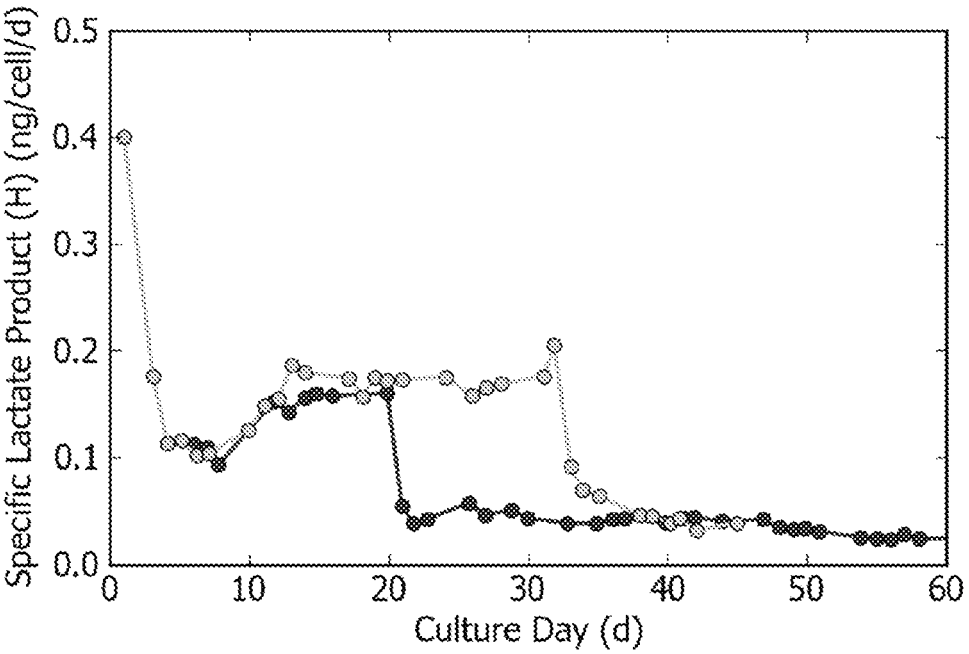

Specific Lactate Product (H) (ng/cell/d)
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
50
60
Culture Day (d)

FIG. 19

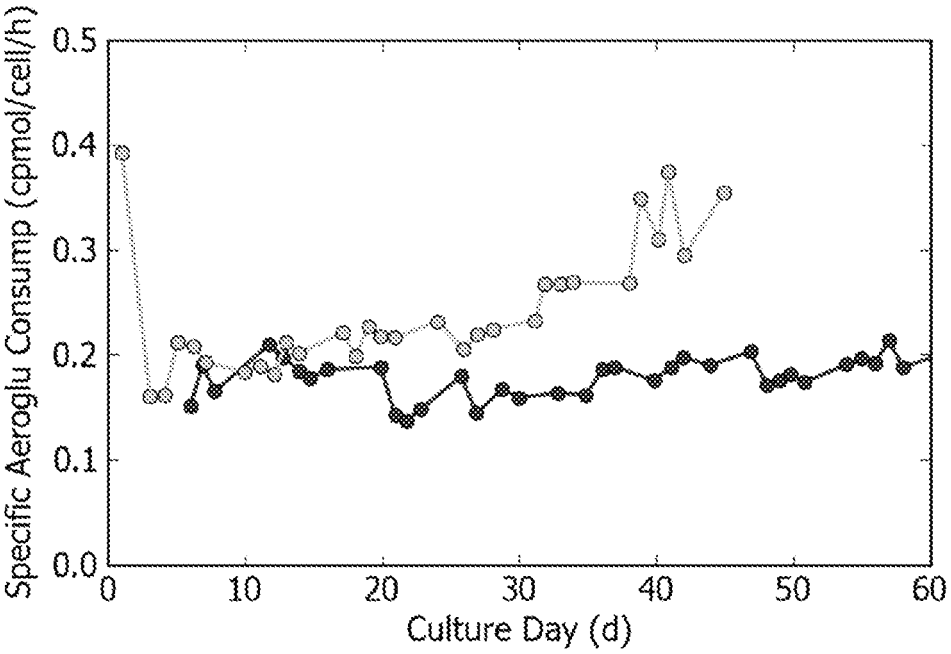

Specific Aeroglu Consump (cpmol/cell/h)
0.5
0.4
0.3
0.2
0.1
0.0
0
10
20
30
40
50
60
Culture Day (d)

FIG. 20

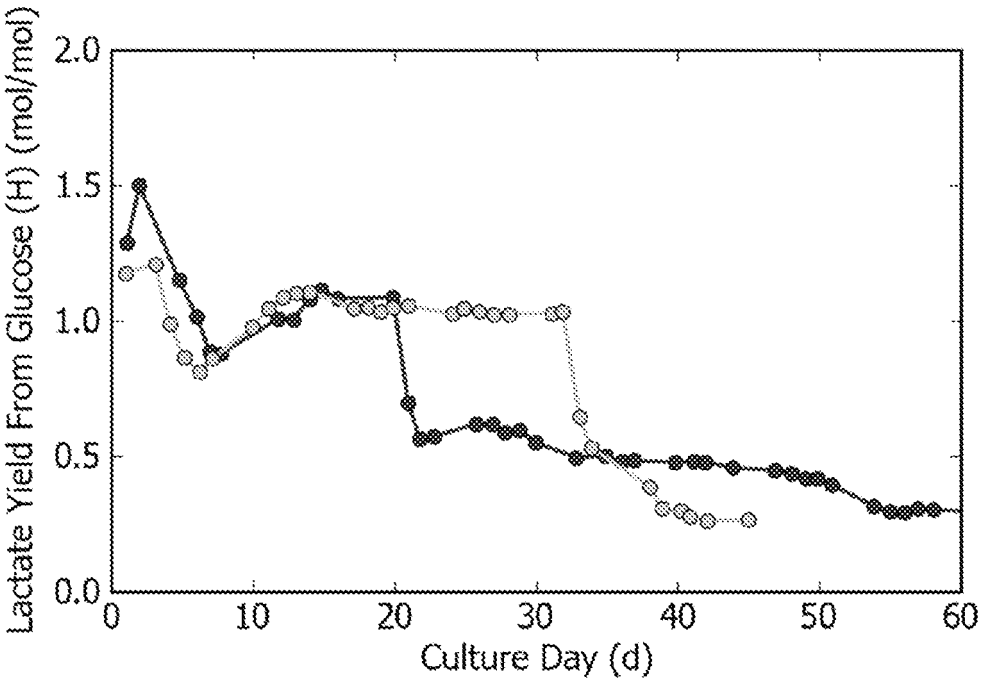

Lactate Yield From Glucose (H) (mol/mol)
2.0
1.5
1.0
0.5
0.0
0
10
20
30
40
50
60
Culture Day (d)

FIG. 21