FIG. 1

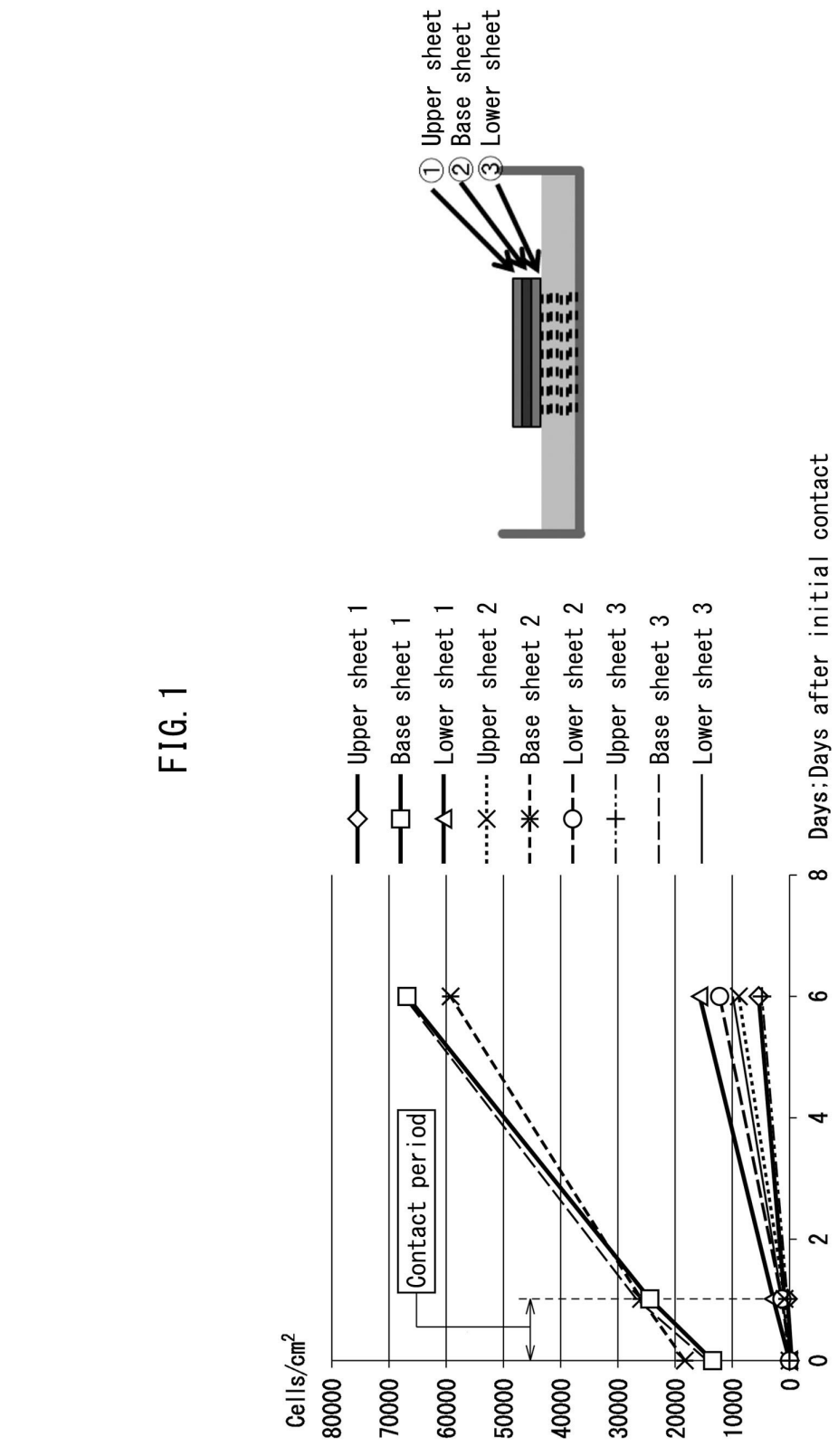

① Upper sheet
② Base sheet
③ Lower sheet
Upper sheet 1
Base sheet 1
Lower sheet 1
Upper sheet 2
Base sheet 2
Lower sheet 2
Upper sheet 3
Base sheet 3
Lower sheet 3
Contact period
Cells/cm²
80000
70000
60000
50000
40000
30000
20000
10000
0
0
2
4
6
8
Days;Days after initial contact

FIG. 2

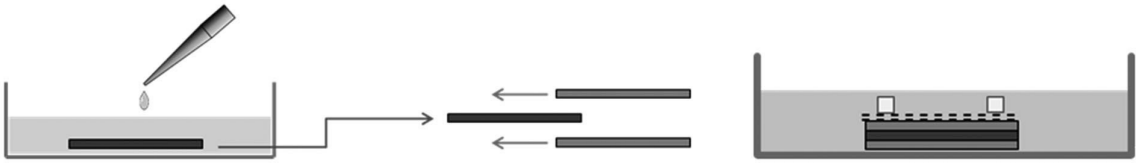
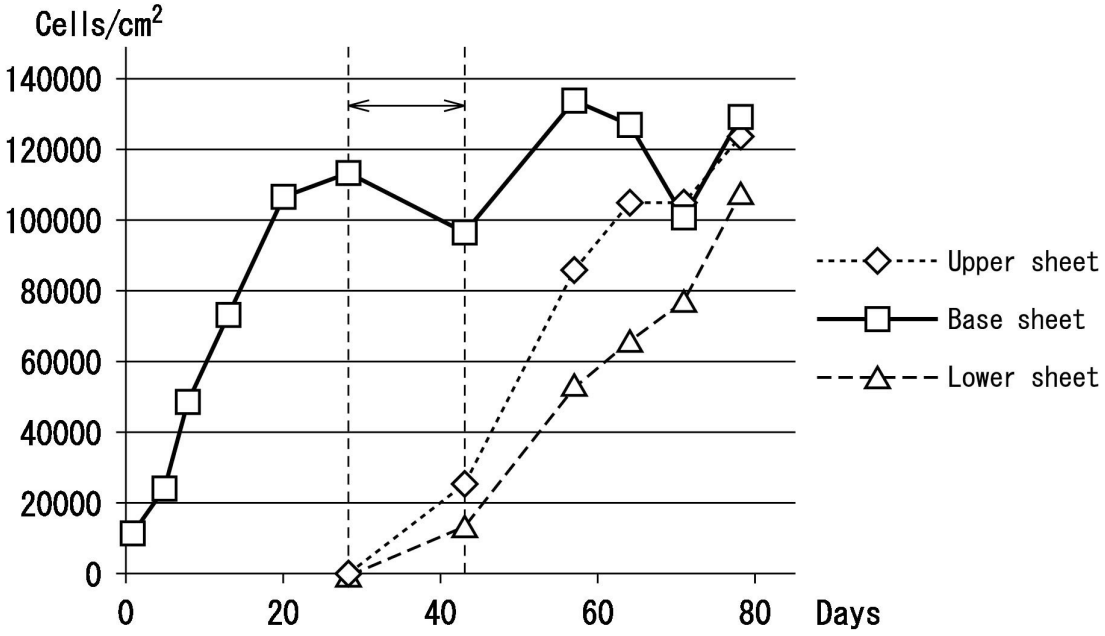


FIG. 3


Cells/cm2
140000
120000
100000
80000
60000
40000
20000
0
0
20
40
60
80
Days
Upper sheet
Base sheet
Lower sheet

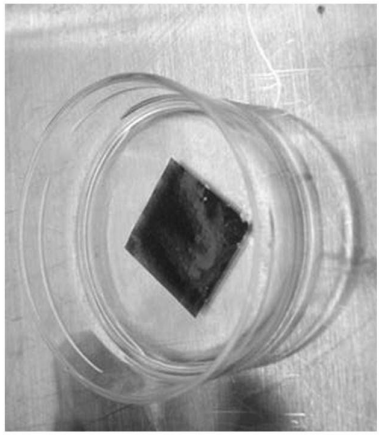




FIG. 4

FIG. 5

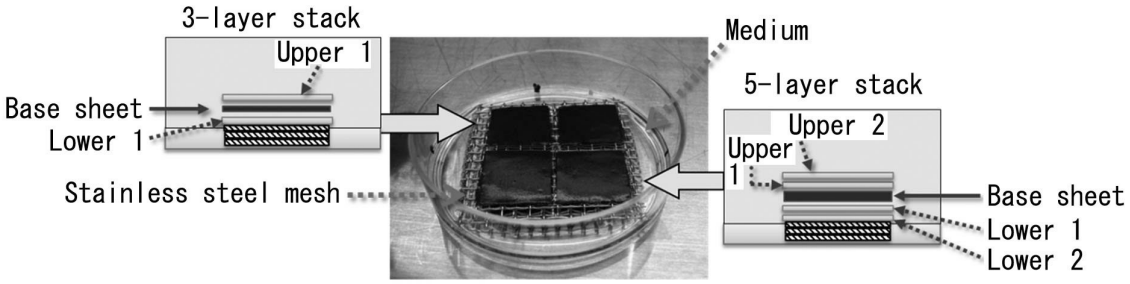

3-layer stack
Upper 1
Base sheet
Lower 1
Stainless steel mesh
Medium
5-layer stack
Upper 2
Upper 1
Base sheet
Lower 1
Lower 2

FIG. 6

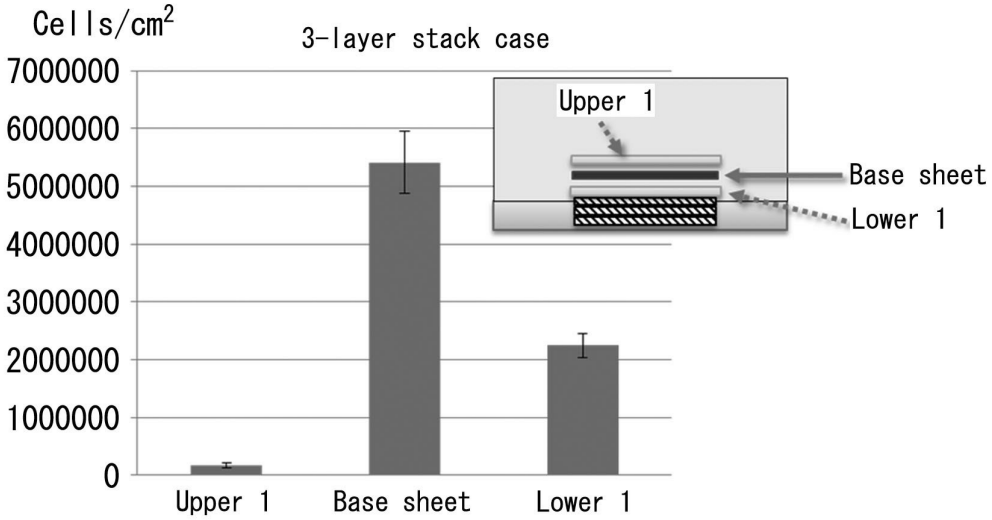

Cells/cm2
3-layer stack case
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
Upper 1
Base sheet
Lower 1
Upper 1
Base sheet
Lower 1

FIG. 7

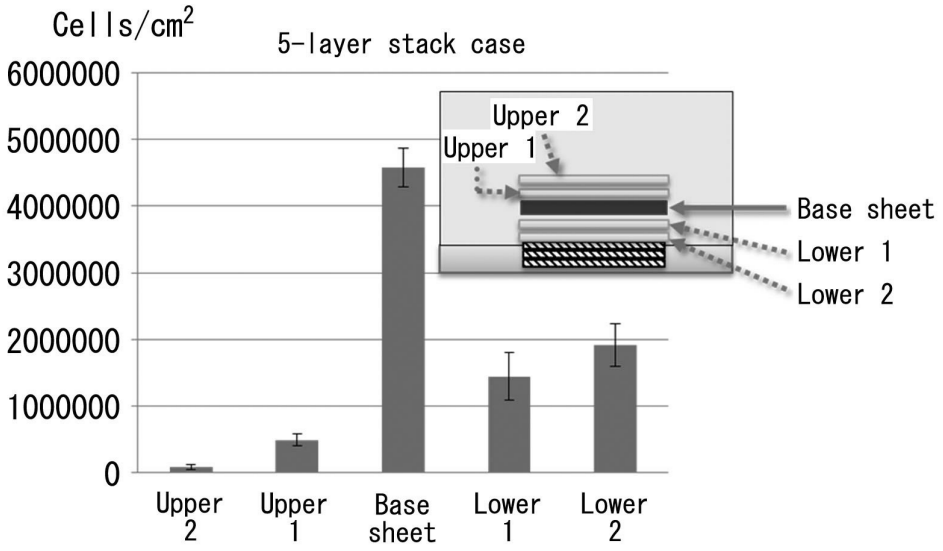

Cells/cm2
5-layer stack case
6000000
5000000
4000000
3000000
2000000
1000000
0
Upper 2
Upper 1
Base sheet
Lower 1
Lower 2
Upper 2
Upper 1
Base sheet
Lower 1
Lower 2

FIG. 8

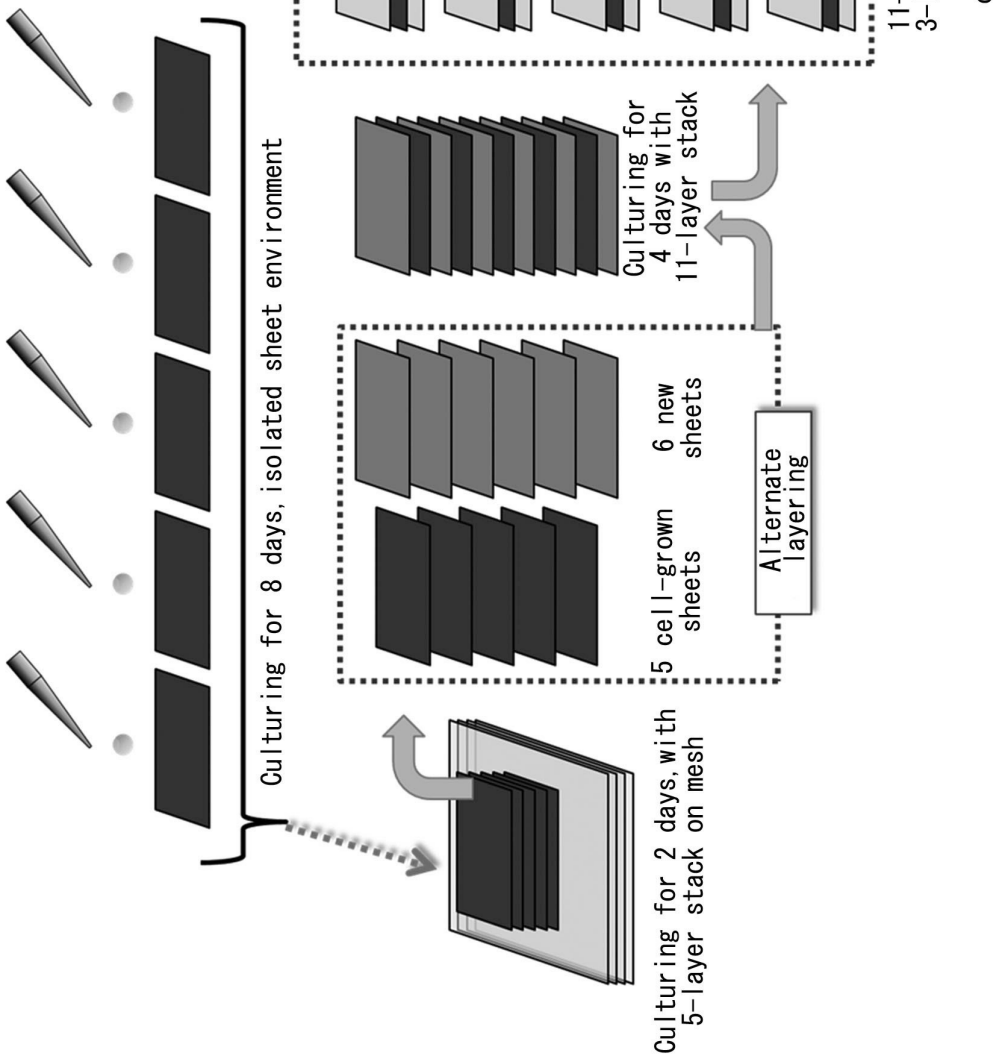

Culturing for 8 days, isolated sheet environment
Culturing for 2 days, with 5-layer stack on mesh
5 cell-grown sheets
6 new sheets
Alternate layering
Culturing for 4 days with 11-layer stack
11-layer stack separated, 3-layer stack formed with each, and culturing continued for 14 days

FIG. 9

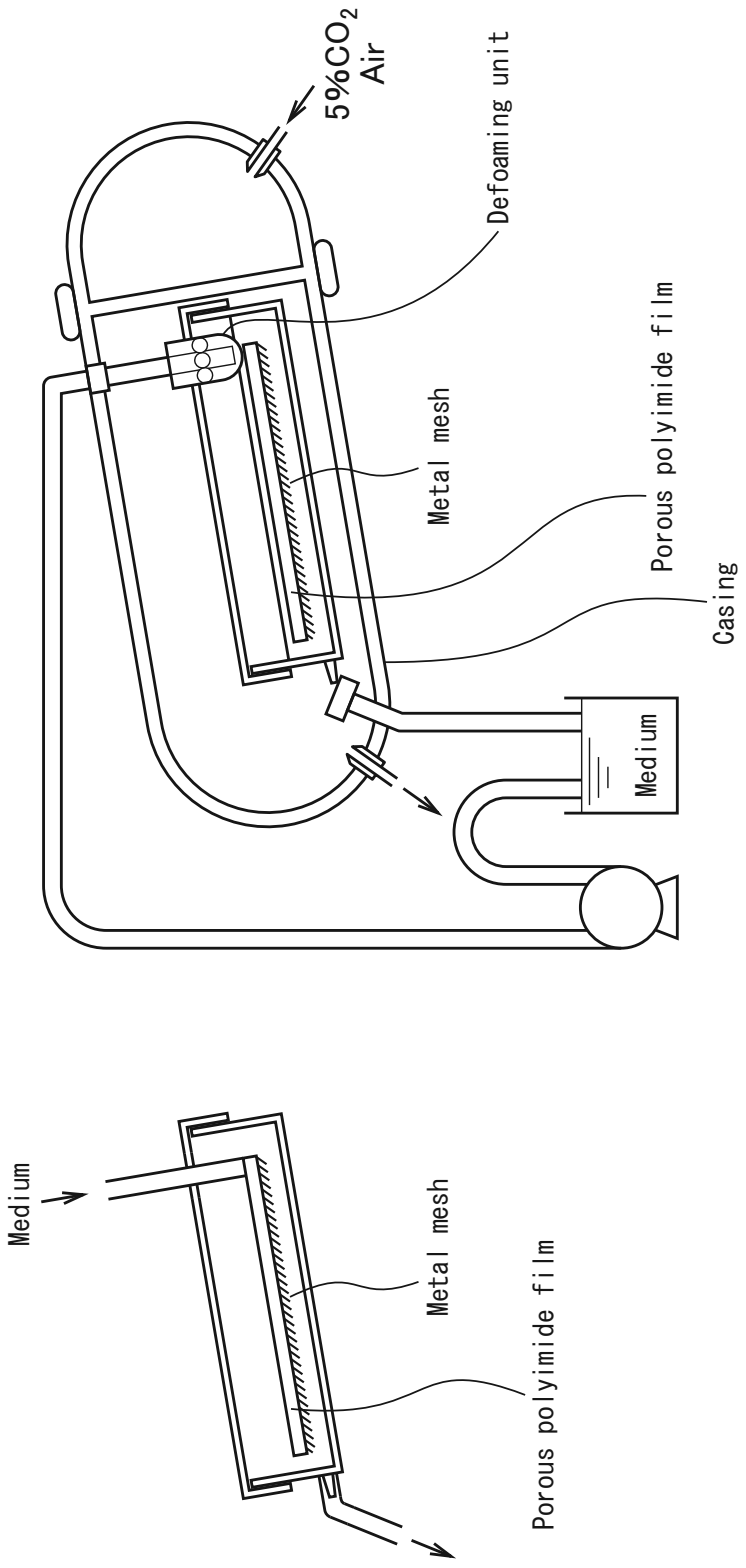

5%CO2
Air
Defoaming unit
Metal mesh
Porous polyimide film
Casing
Medium
Medium
Metal mesh
Porous polyimide film

FIG. 10

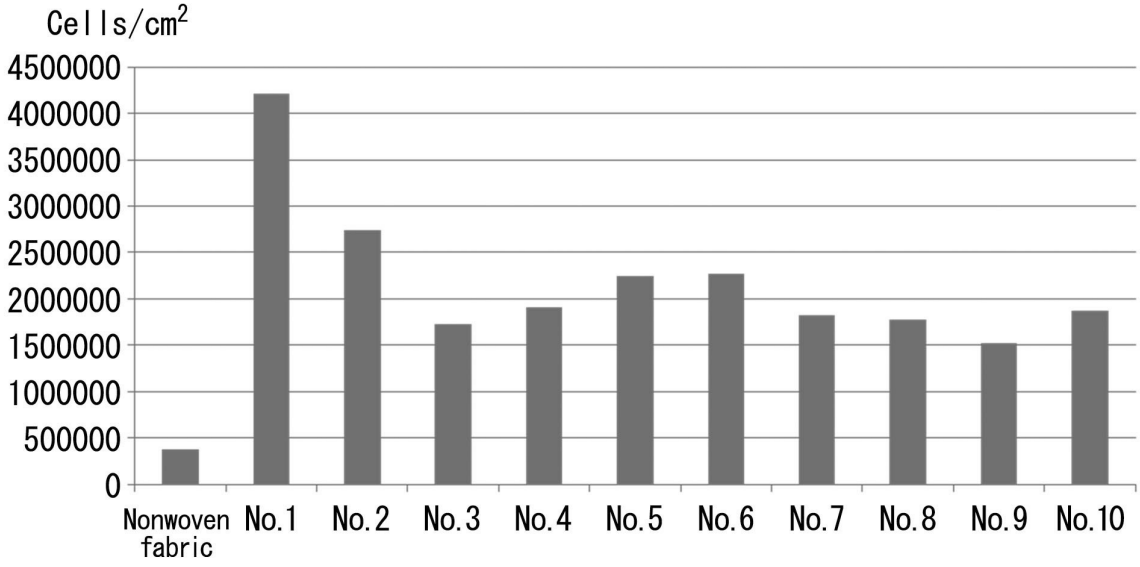

Cells/cm2
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
Nonwoven fabric
No.1
No.2
No.3
No.4
No.5
No.6
No.7
No.8
No.9
No.10

FIG. 11

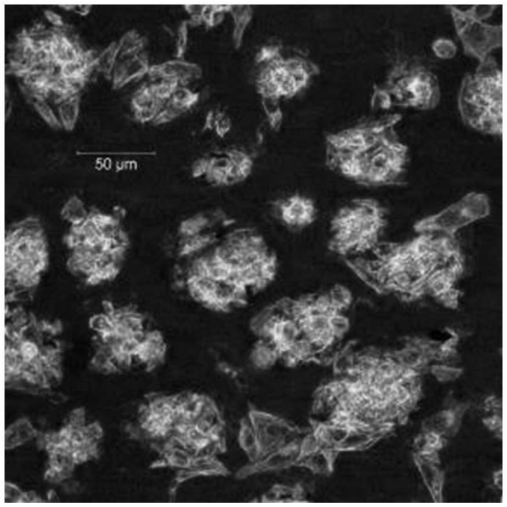

50 μm

FIG. 12

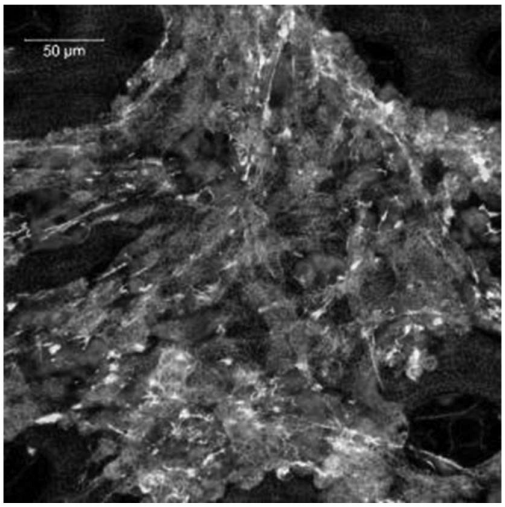
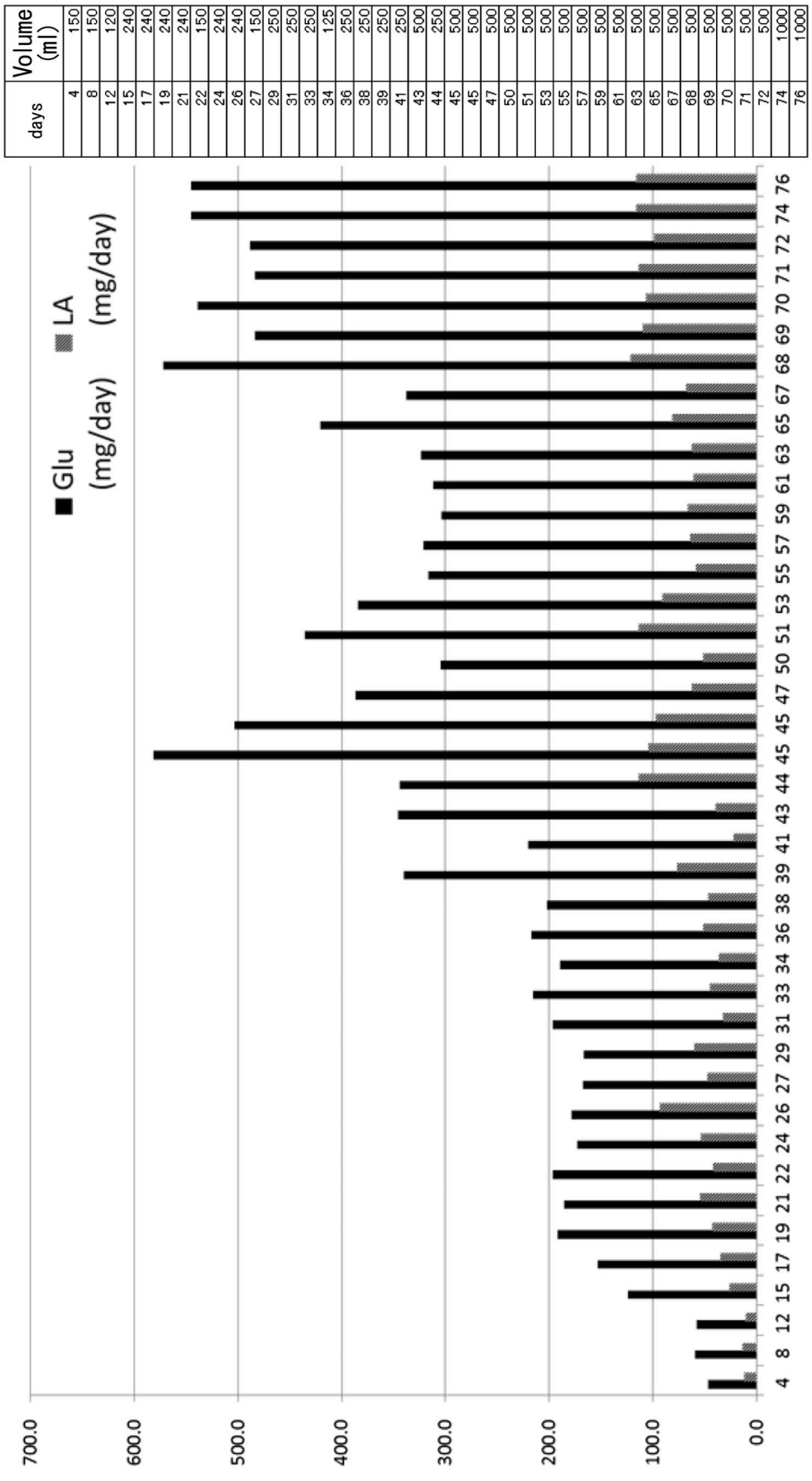


FIG. 13



days	Volume (ml)
4	150
8	150
12	120
15	240
17	240
19	240
21	240
22	150
24	240
26	240
27	150
29	250
31	250
33	250
34	125
36	250
38	250
39	250
41	250
43	500
44	250
45	500
45	500
47	500
50	500
51	500
53	500
55	500
57	500
59	500
61	500
63	500
65	500
67	500
68	500
69	500
70	500
71	500
72	500
74	1000
76	1000

FIG. 14

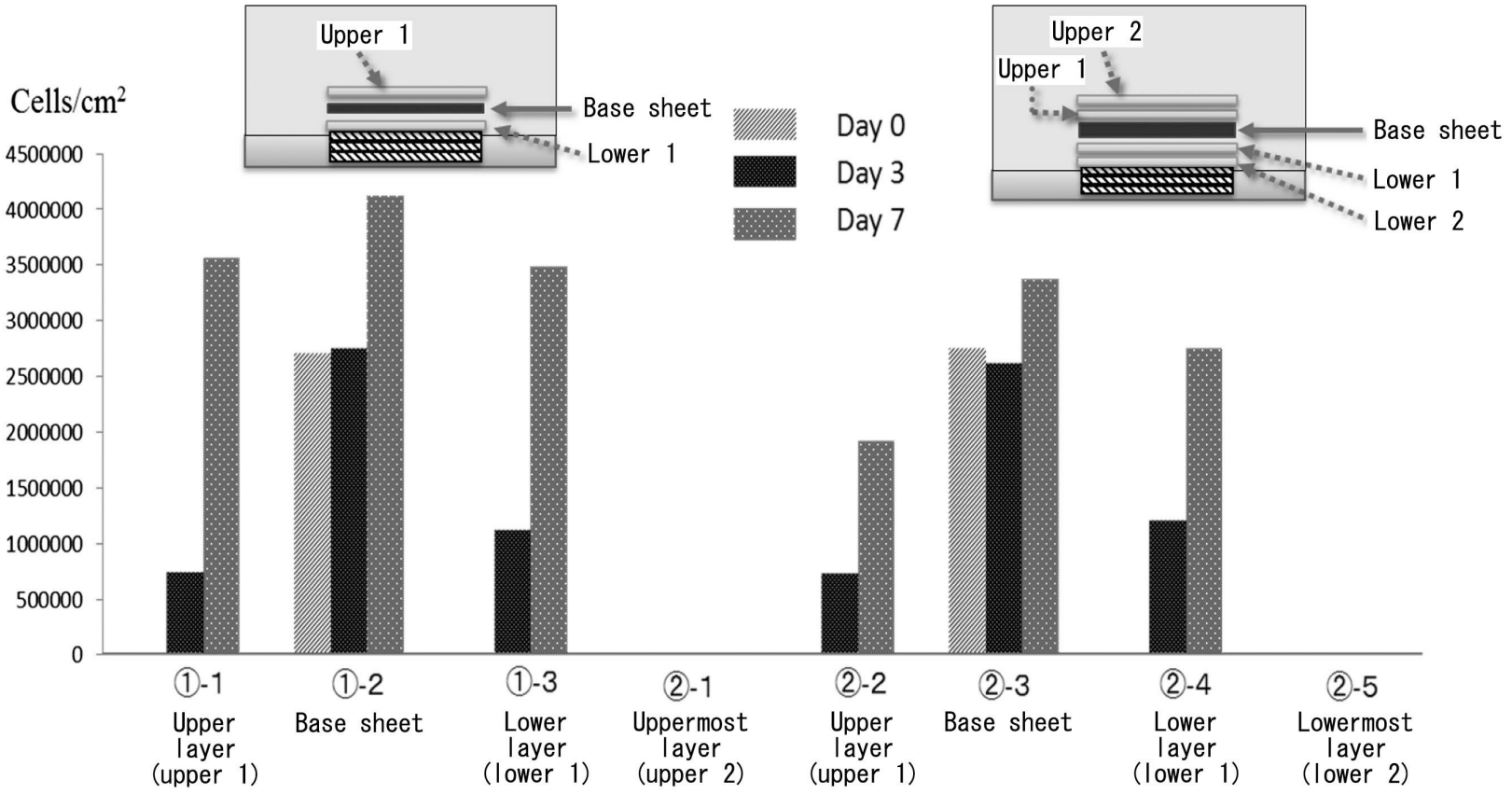
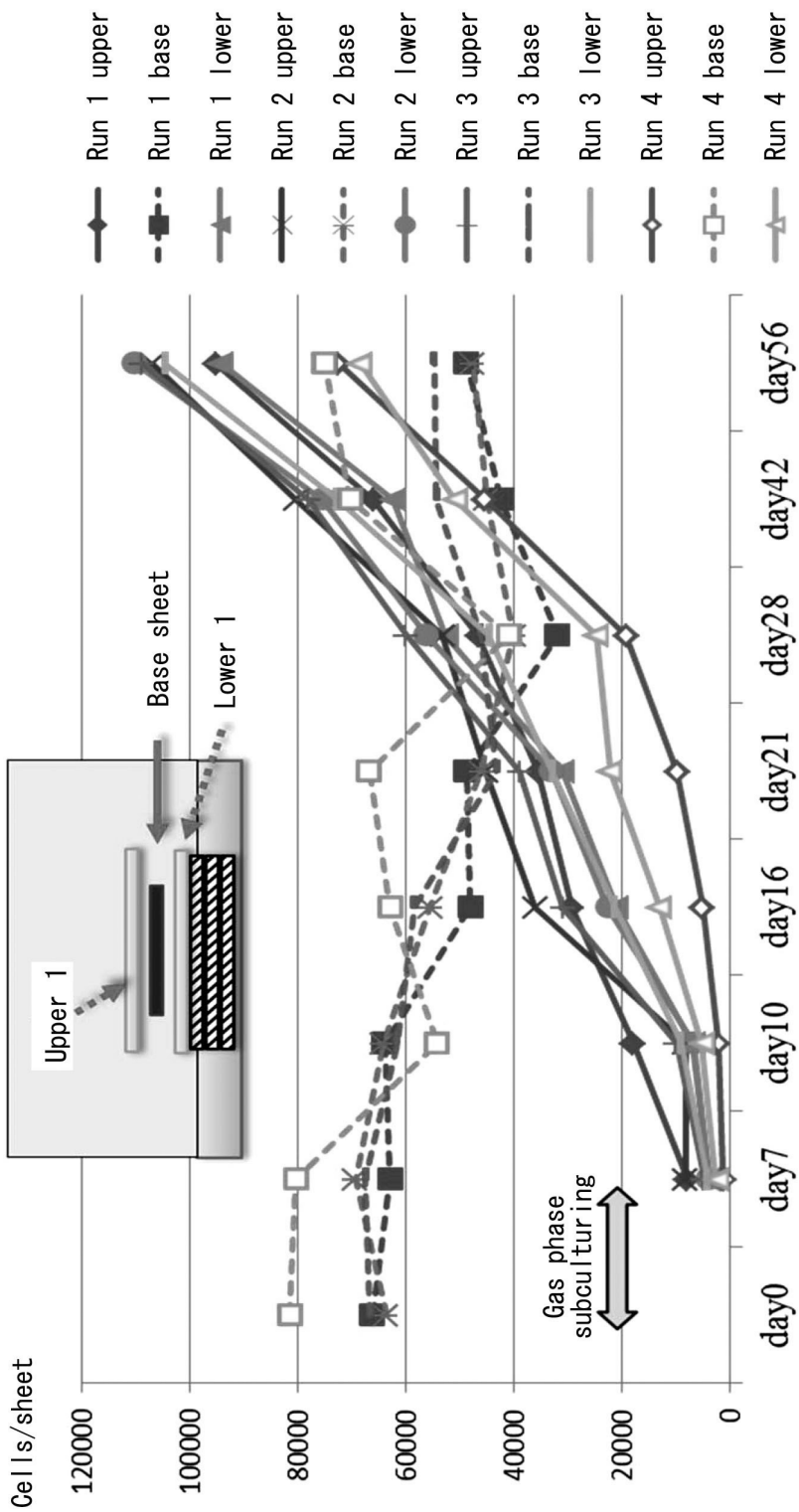

Cells/cm²
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
Upper 1
Base sheet
Lower 1
Day 0
Day 3
Day 7
Upper 2
Upper 1
Base sheet
Lower 1
Lower 2
①-1
Upper layer (upper 1)
①-2
Base sheet
①-3
Lower layer (lower 1)
②-1
Uppermost layer (upper 2)
②-2
Upper layer (upper 1)
②-3
Base sheet
②-4
Lower layer (lower 1)
②-5
Lowermost layer (lower 2)

FIG. 15


Cells/sheet
120000
100000
80000
60000
40000
20000
0
day0
day7
day10
day16
day21
day28
day42
day56
Gas phase subculturing
Upper 1
Base sheet
Lower 1
Run 1 upper
Run 1 base
Run 1 lower
Run 2 upper
Run 2 base
Run 2 lower
Run 3 upper
Run 3 base
Run 3 lower
Run 4 upper
Run 4 base
Run 4 lower