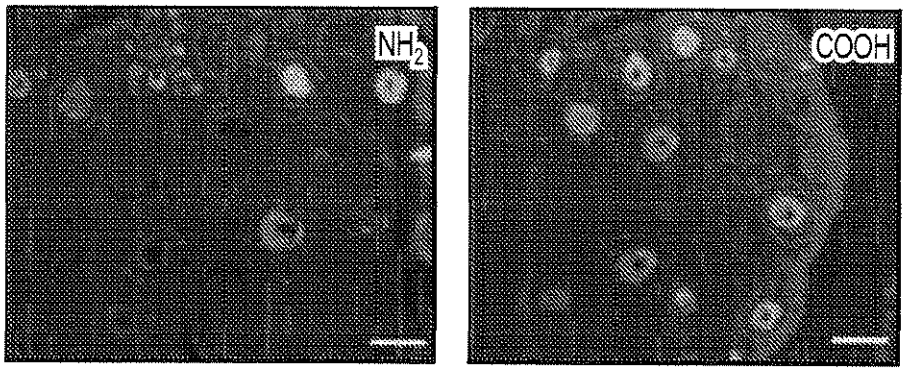

NH2
COOH

FIG. 1A

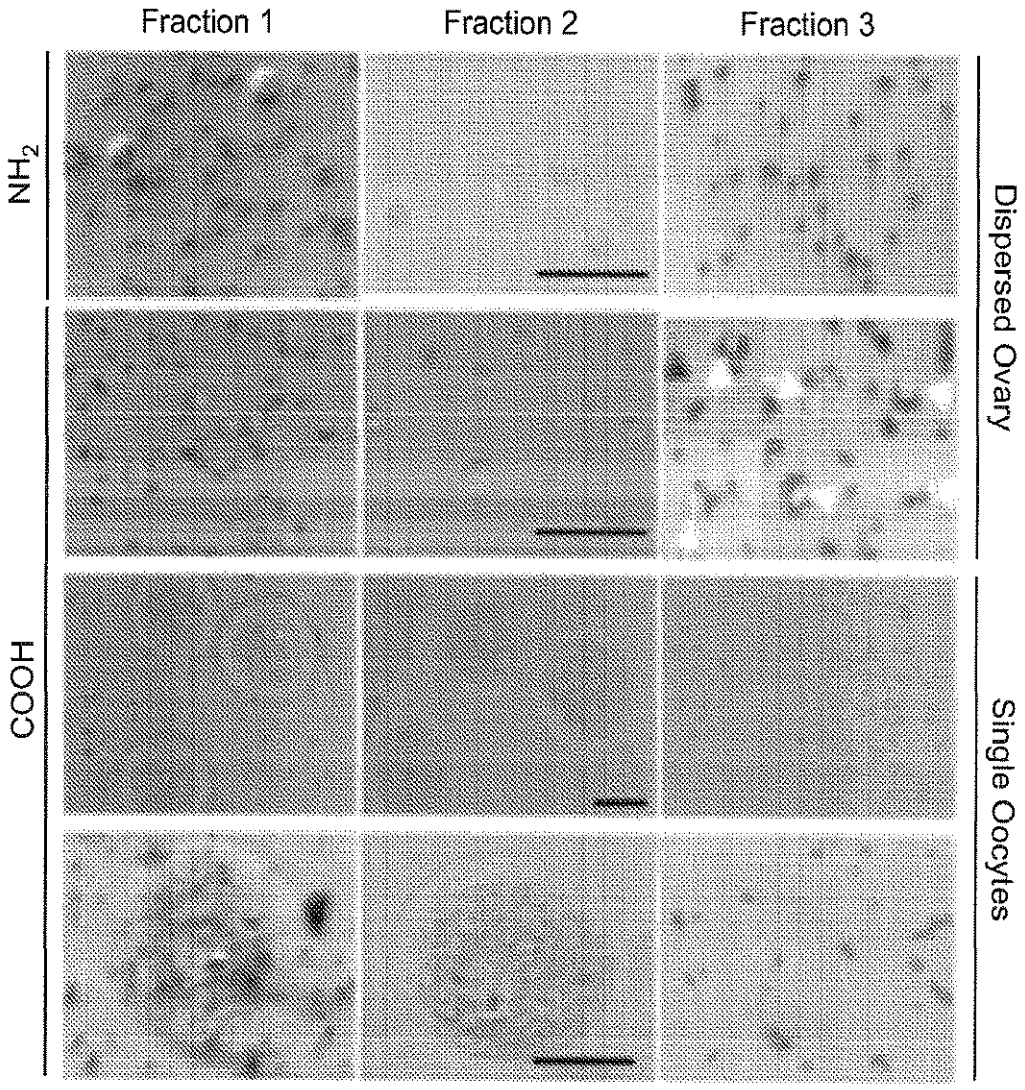

Fraction 1
Fraction 2
Fraction 3
NH2
COOH
Dispersed Ovary
Single Oocytes

FIG. 1B

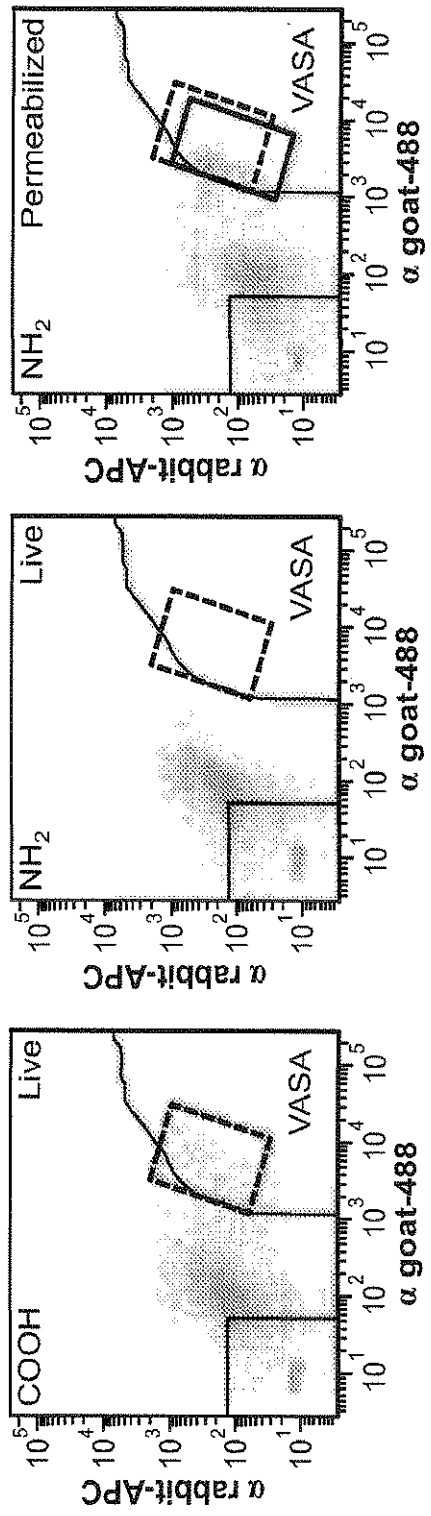

Permeabilized
NH2
VASA
α rabbit-APC
α goat-488
Live
NH2
VASA
α rabbit-APC
α goat-488
Live
COOH
VASA
α rabbit-APC
α goat-488

FIG. 1C

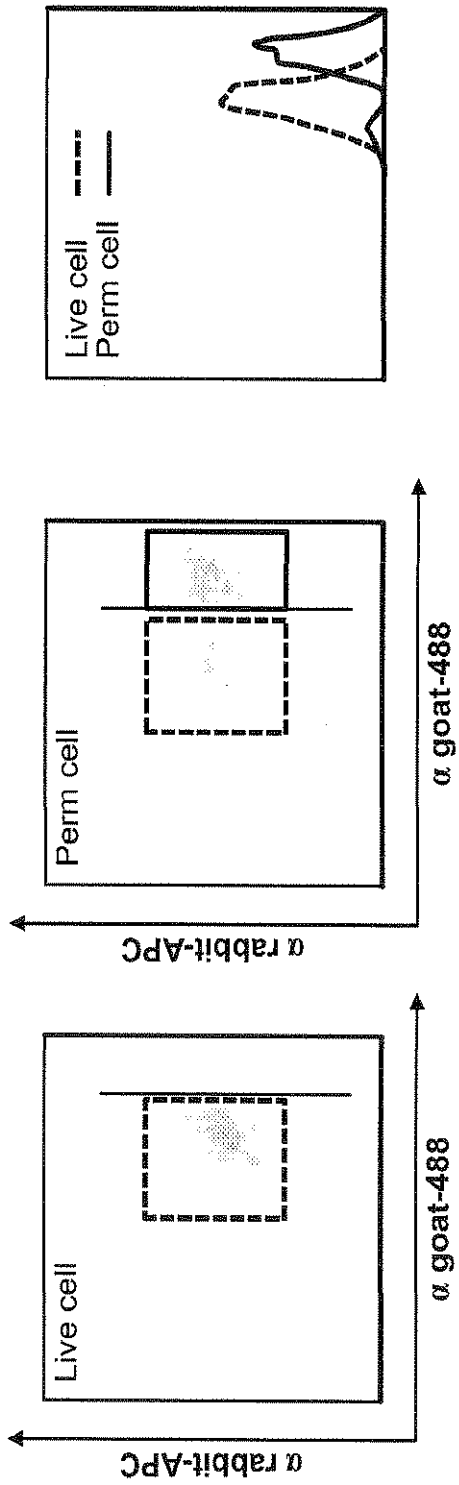

Live cell
Perm cell
Perm cell
α rabbit-APC
α goat-488
Live cell
α rabbit-APC
α goat-488

FIG. 1D

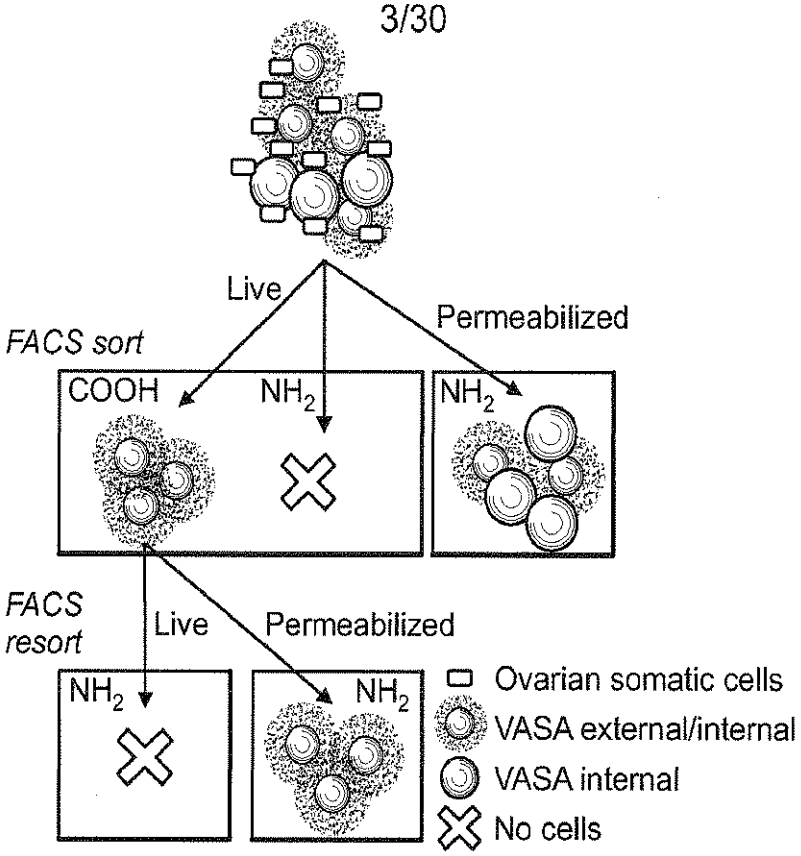

Live
Permeabilized
FACS sort
COOH
NH2
NH2
FACS resort
Live
Permeabilized
NH2
NH2
Ovarian somatic cells
VASA external/internal
VASA internal
No cells

FIG. 1E

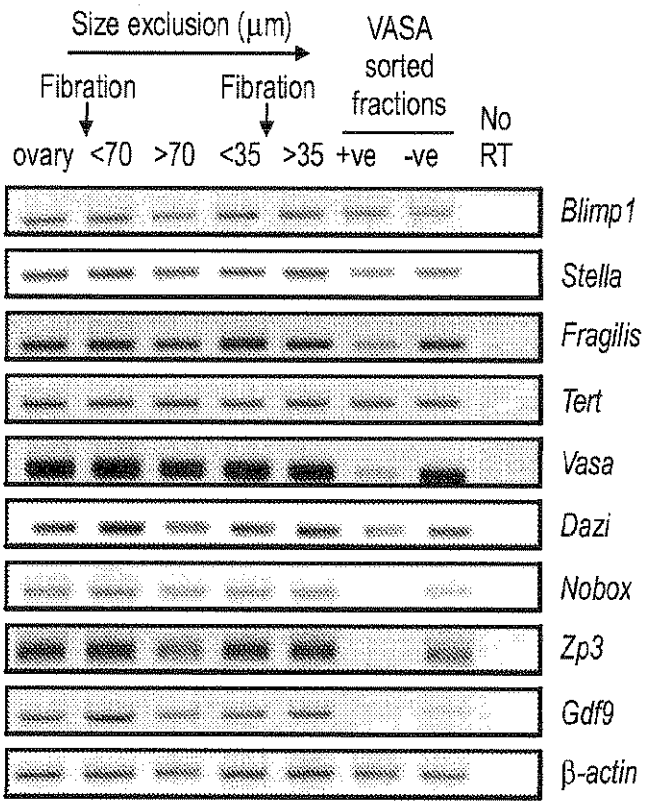

Size exclusion (µm)
VASA sorted fractions
Fibration
Fibration
ovary
<70
>70
<35
>35
+ve
-ve
No RT
Blimp1
Stella
Fragilis
Tert
Vasa
Dazi
Nobox
Zp3
Gdf9
β-actin

FIG. 1F

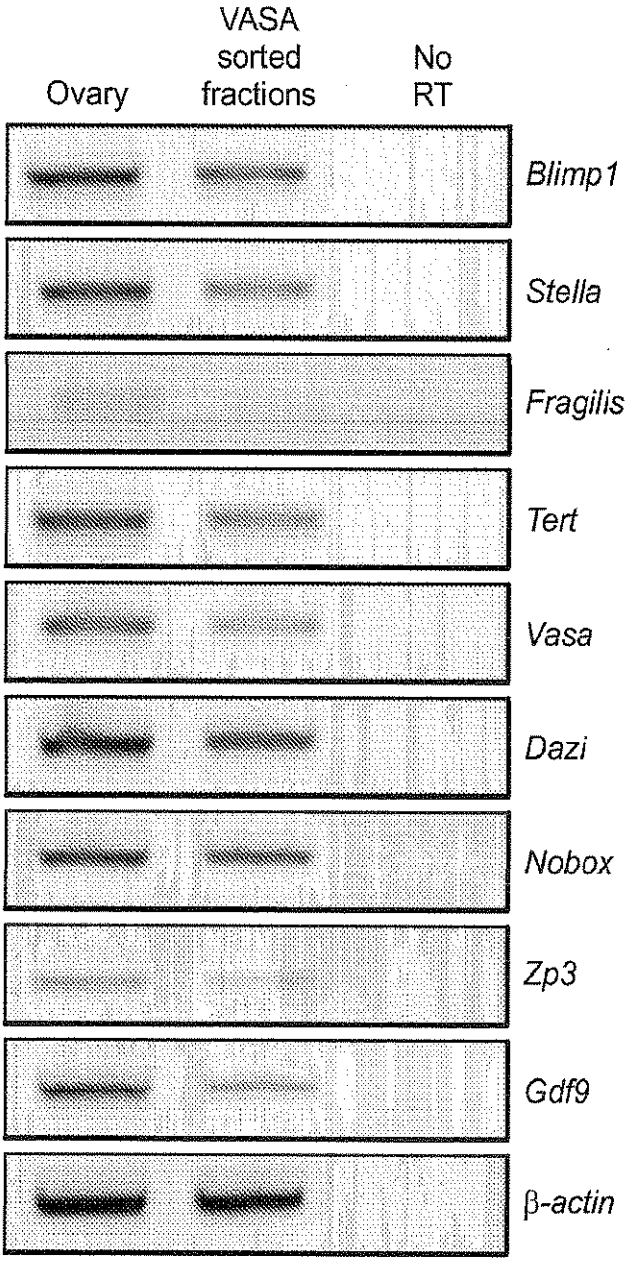

Ovary
VASA sorted fractions
No RT
Blimp1
Stella
Fragilis
Tert
Vasa
Dazi
Nobox
Zp3
Gdf9
β-actin

FIG. 2

FIG. 3A

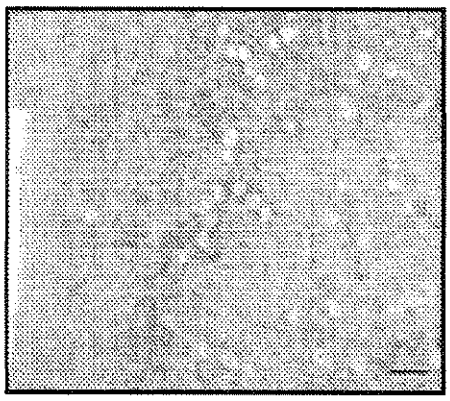
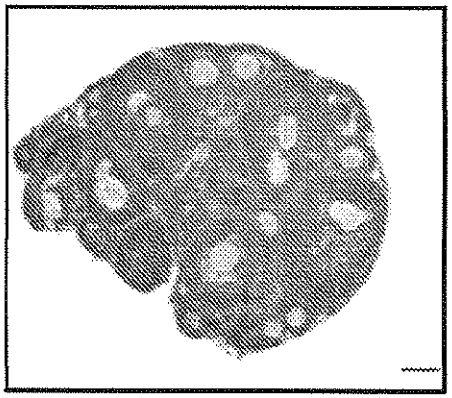


FIG. 3B



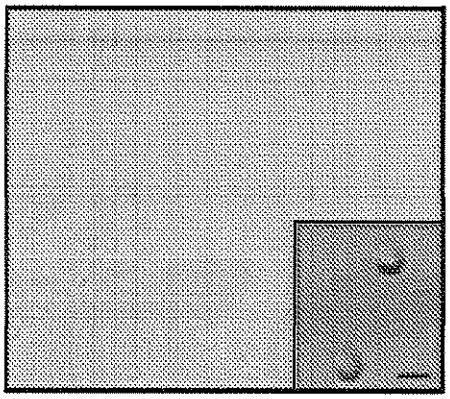


FIG. 3C

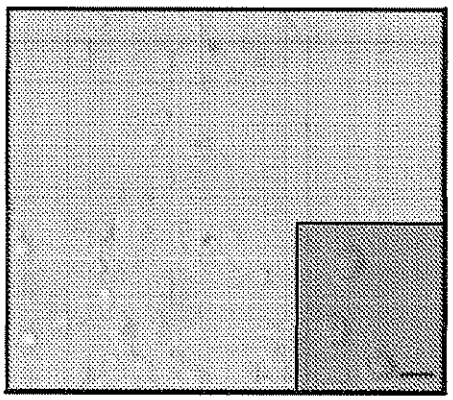


FIG. 3D

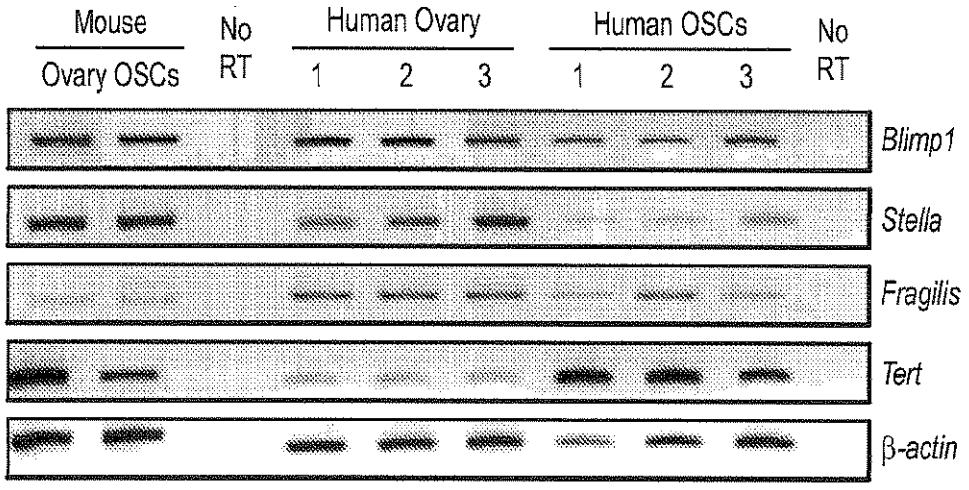


FIG. 3E

FIG. 3H

FIG. 3F FIG. 3G

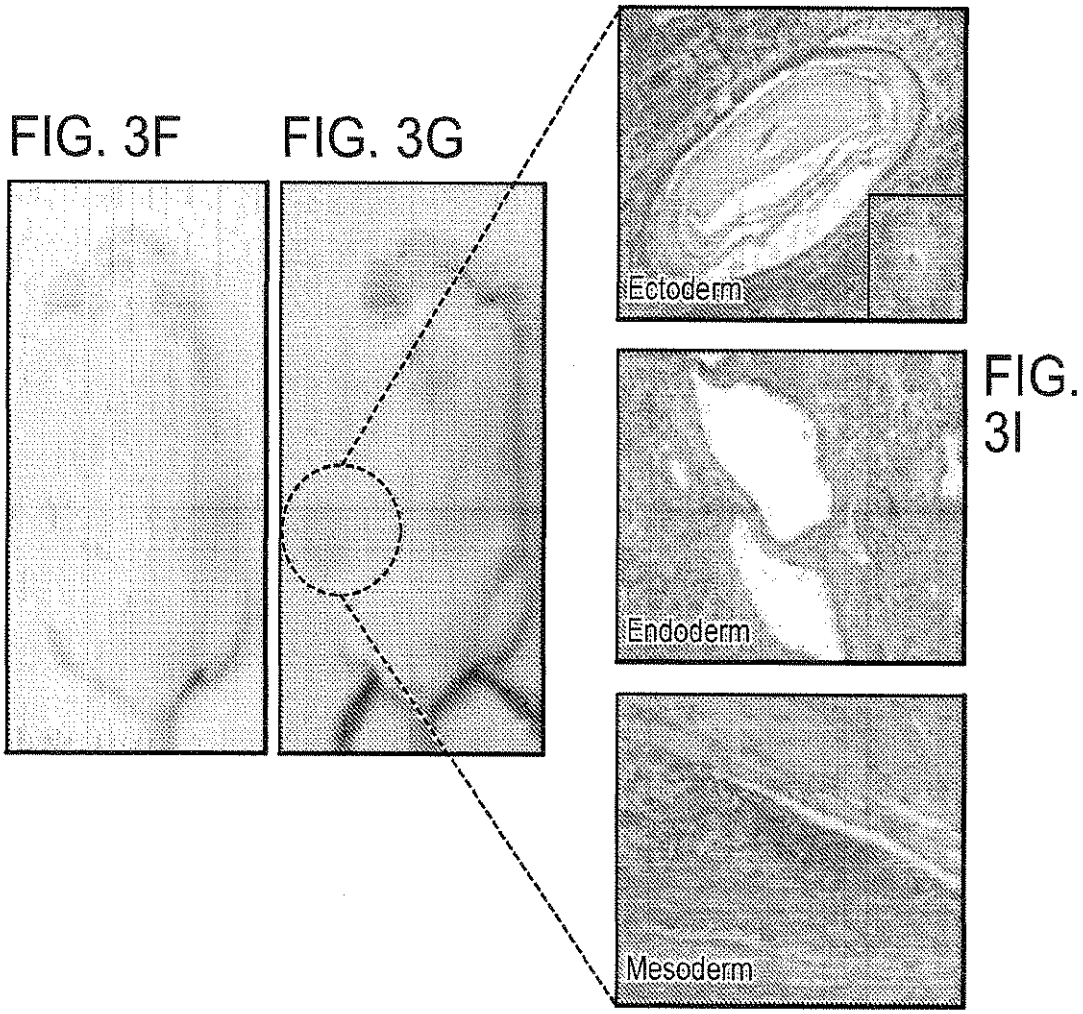
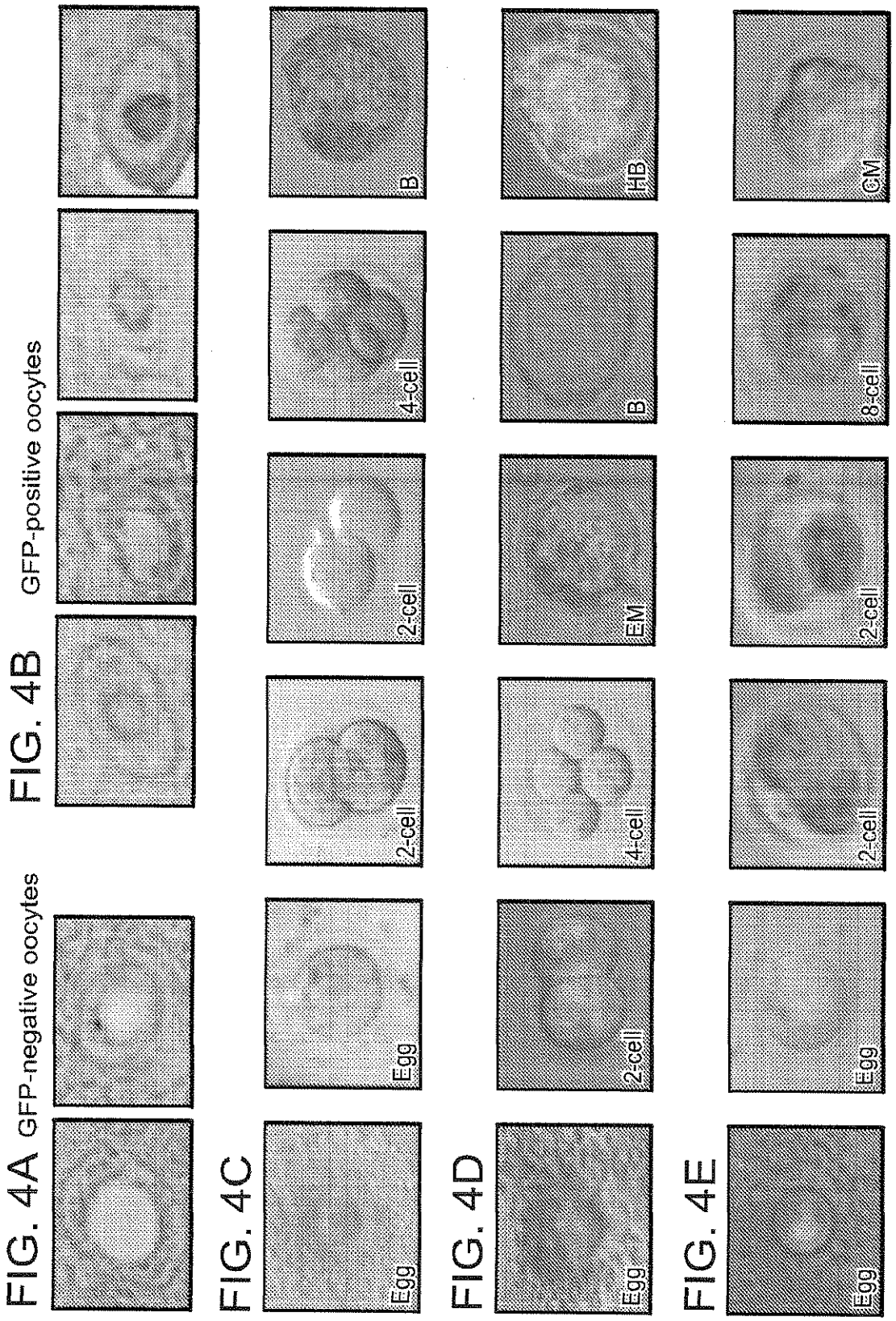


FIG. 3I

FIG. 3J

Cell type	Cell # injected	Duration (weeks)	Teratoma Formation
mESC (v6.5)	1×10^5	3	3/3
mOSC (C57BL/6)	1×10^5	24	0/3

FIG. 3K


FIG. 4A
GFP-negative oocytes
FIG. 4B
GFP-positive oocytes
FIG. 4C
Egg
2-cell
4-cell
B
FIG. 4D
Egg
2-cell
4-cell
EM
B
HB
FIG. 4E
Egg
2-cell
2-cell
8-cell
CM

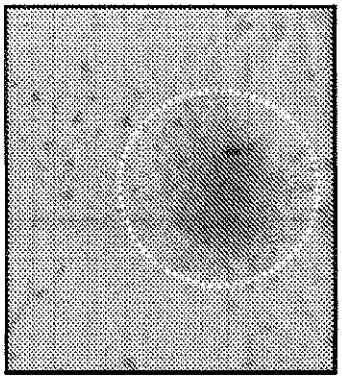


FIG. 5A

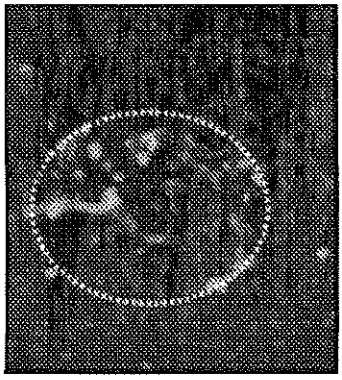


FIG. 5B

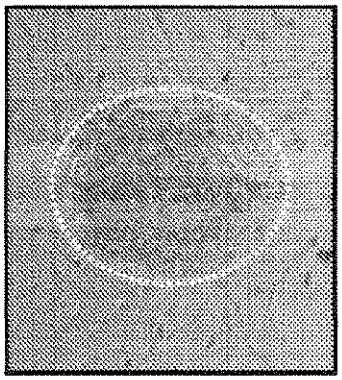


FIG. 5C

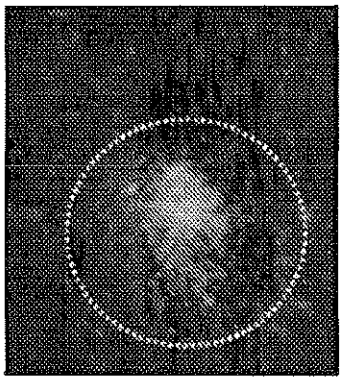


FIG. 5D

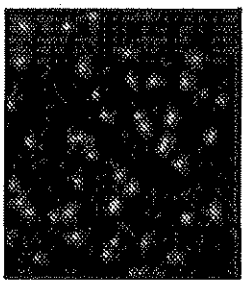


FIG. 6A

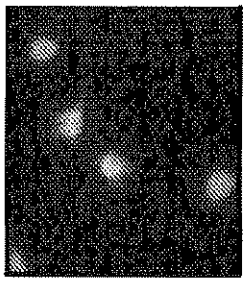


FIG. 6B

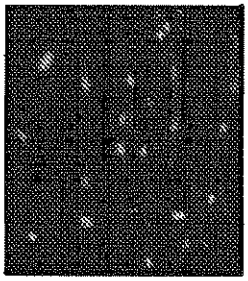


FIG. 6C

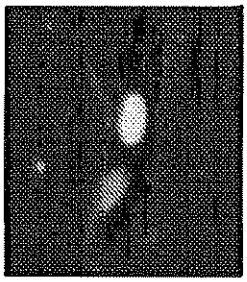


FIG. 6D

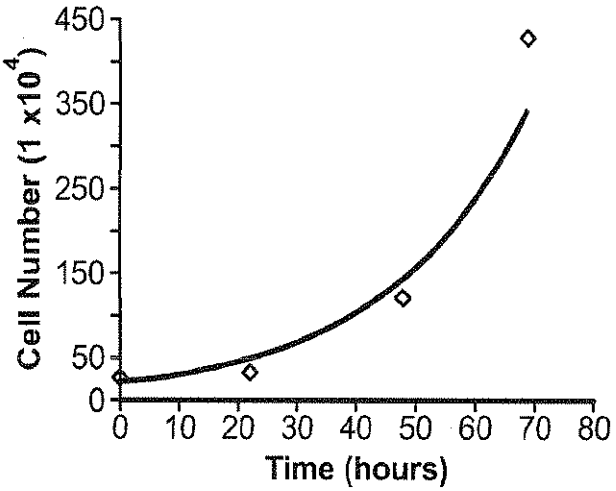


FIG. 6E

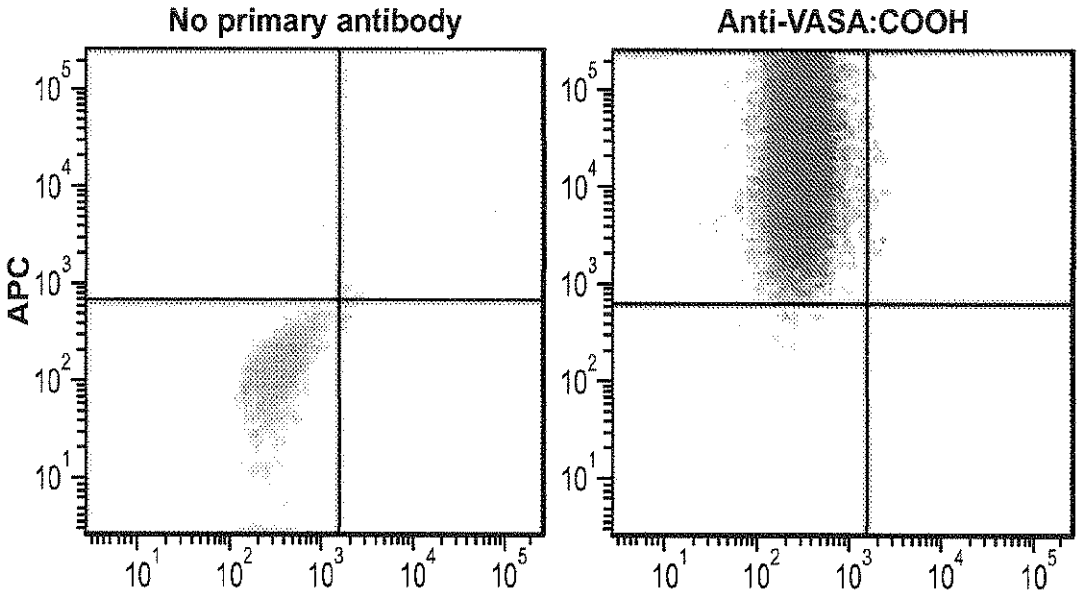


FIG. 6F

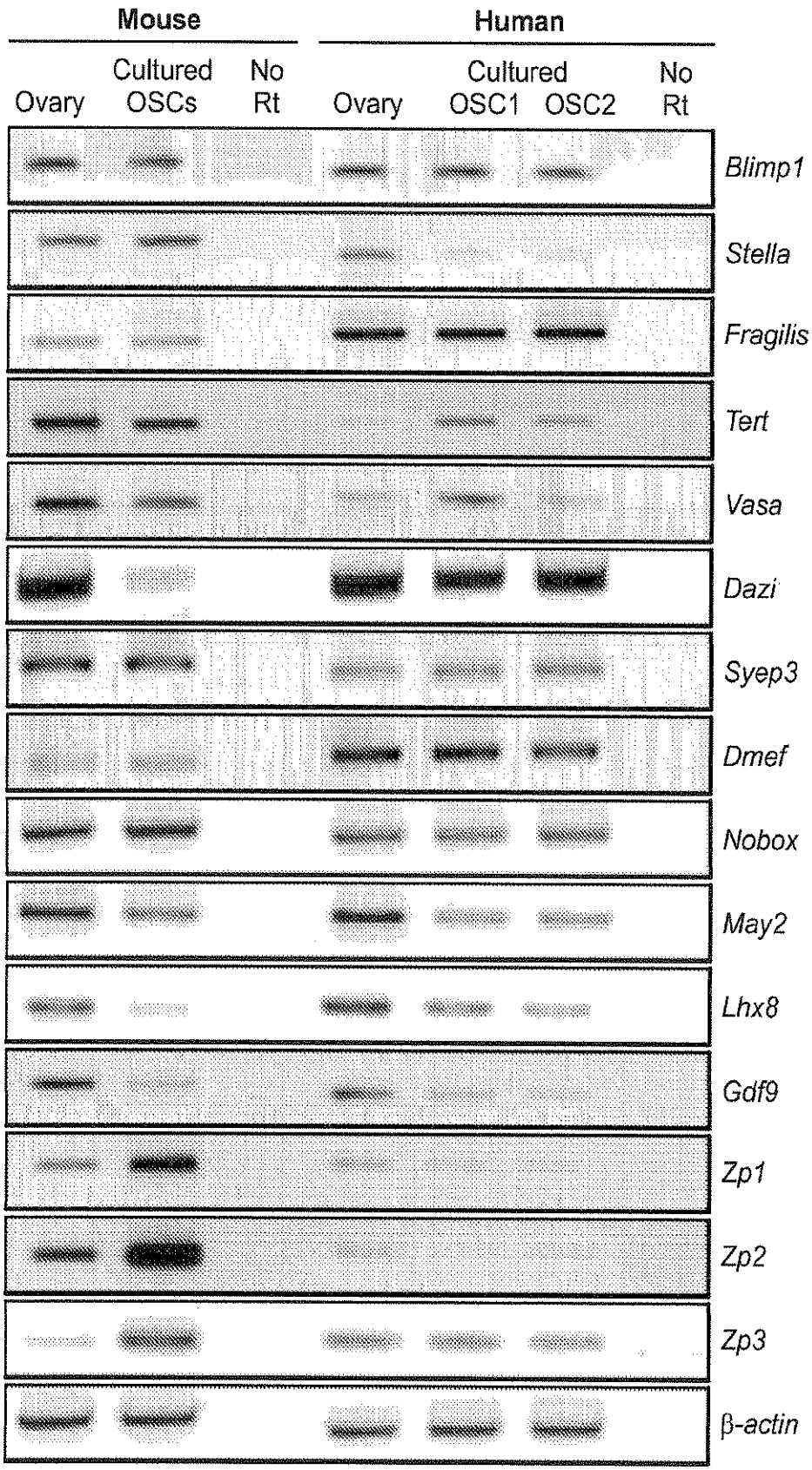

Mouse
Human
Ovary
Cultured OSCs
No Rt
Ovary
Cultured OSC1
Cultured OSC2
No Rt
Blimp1
Stella
Fragilis
Tert
Vasa
Dazi
Syep3
Dmef
Nobox
May2
Lhx8
Gdf9
Zp1
Zp2
Zp3
β-actin

FIG. 6G

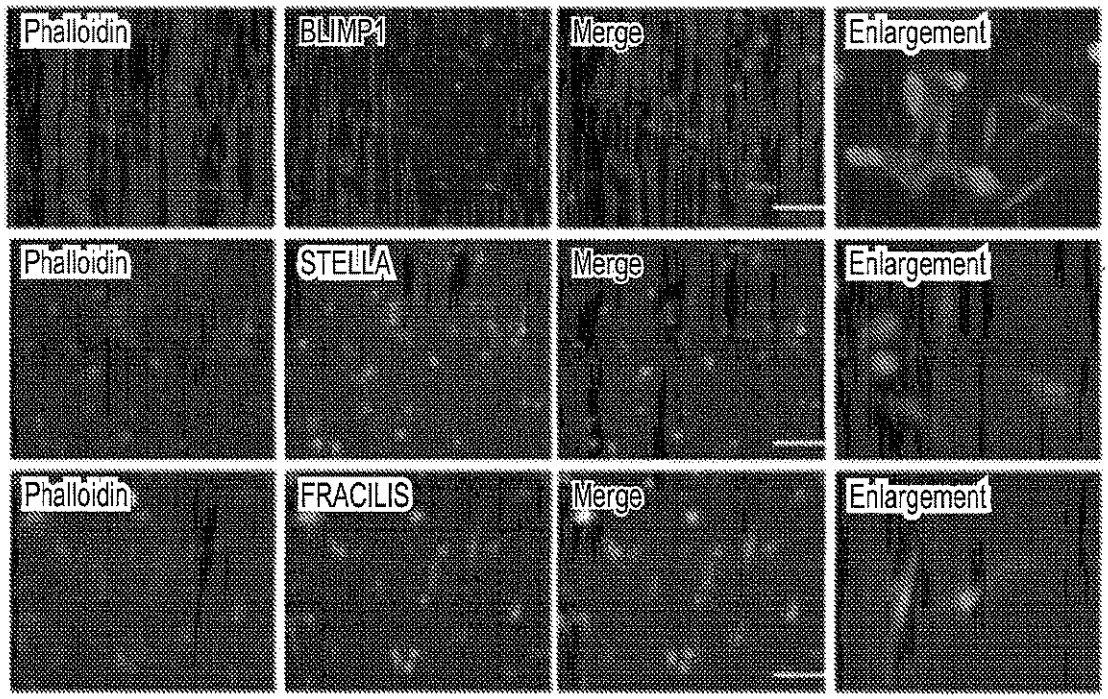

Phalloidin
BLIMP1
Merge
Enlargement
Phalloidin
STELLA
Merge
Enlargement
Phalloidin
FRACILIS
Merge
Enlargement

FIG. 6H

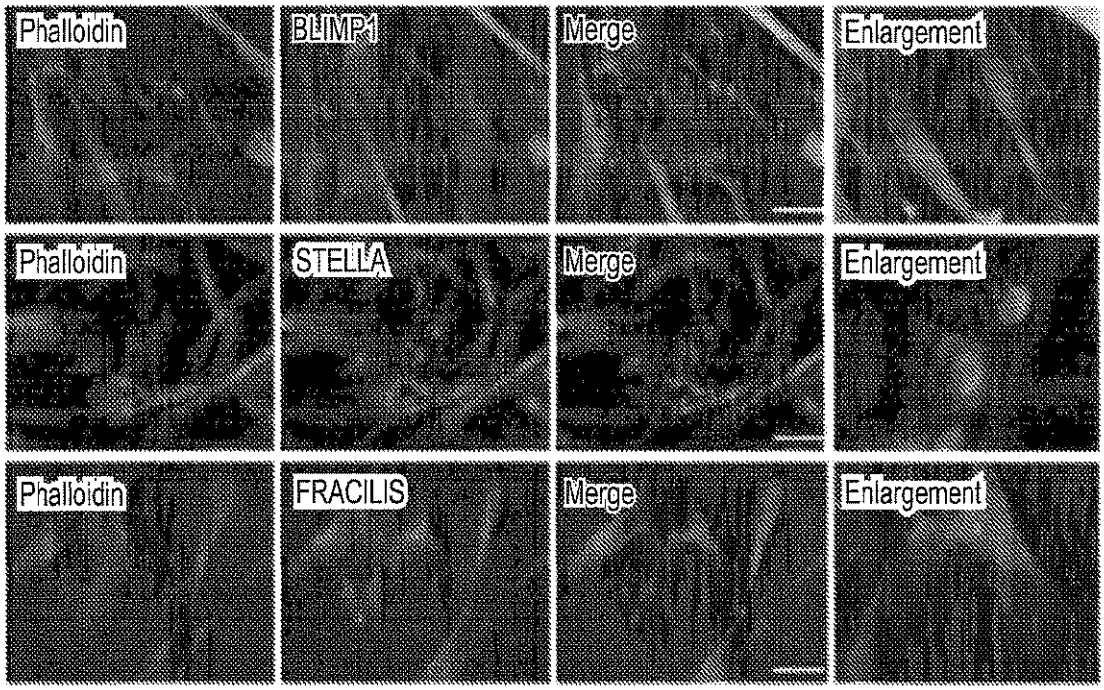

Phalloidin
BLIMP1
Merge
Enlargement
Phalloidin
STELLA
Merge
Enlargement
Phalloidin
FRACILIS
Merge
Enlargement

FIG. 6I

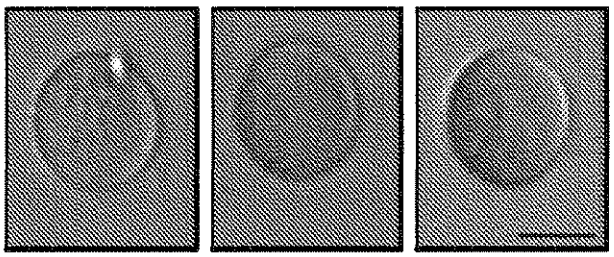


FIG. 7A

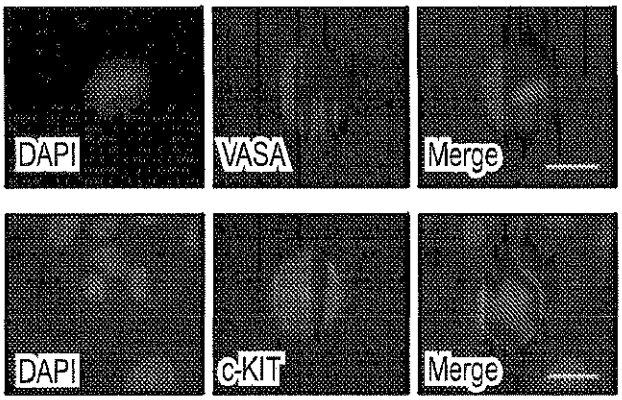


FIG. 7B

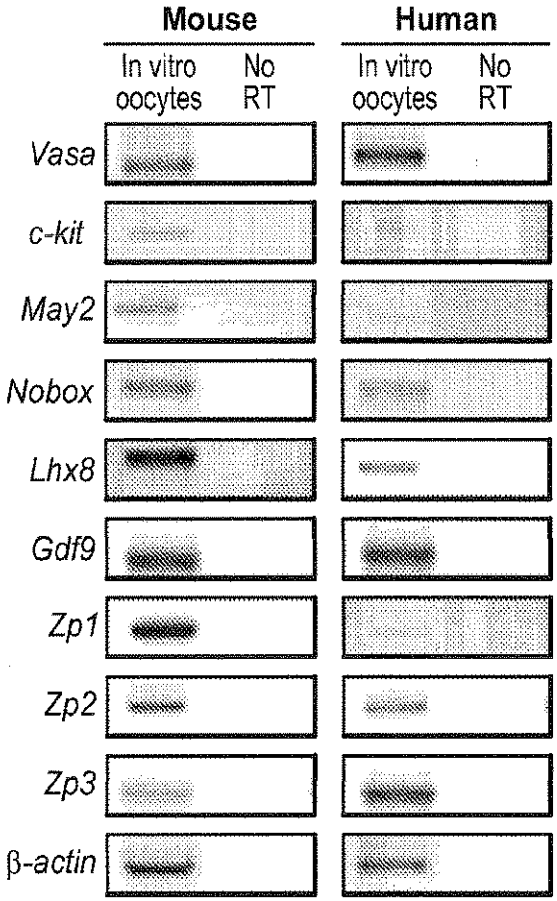


FIG. 7C

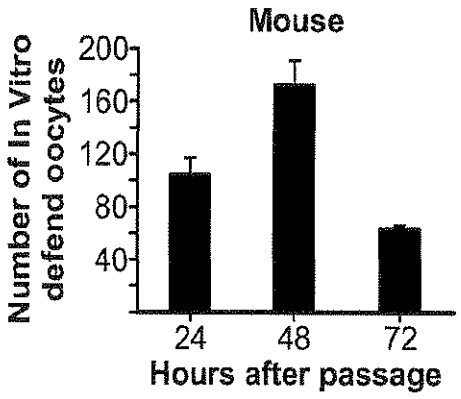


FIG. 7D

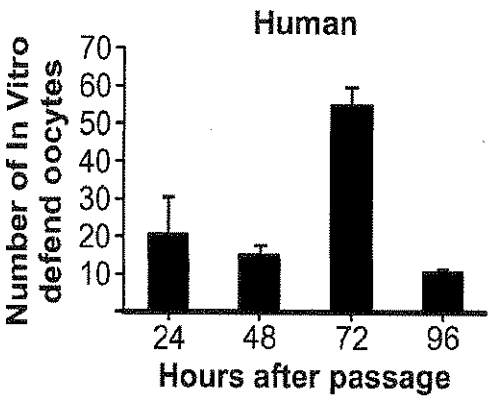


FIG. 7E

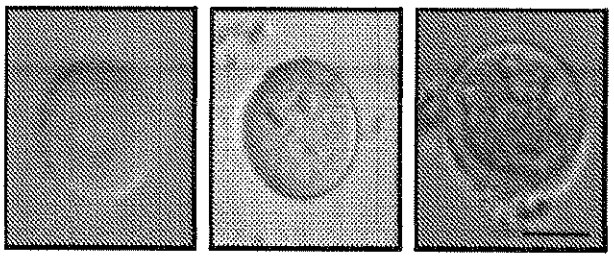


FIG. 7F

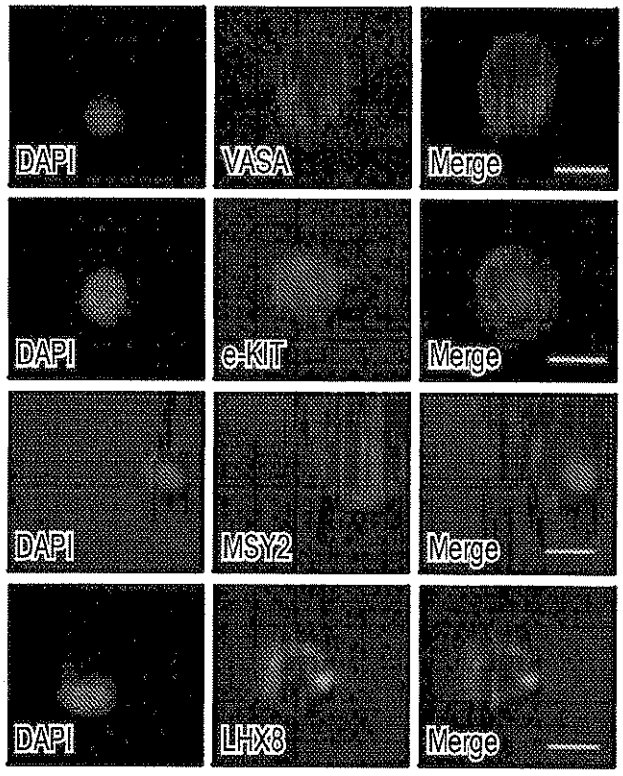


FIG. 7G

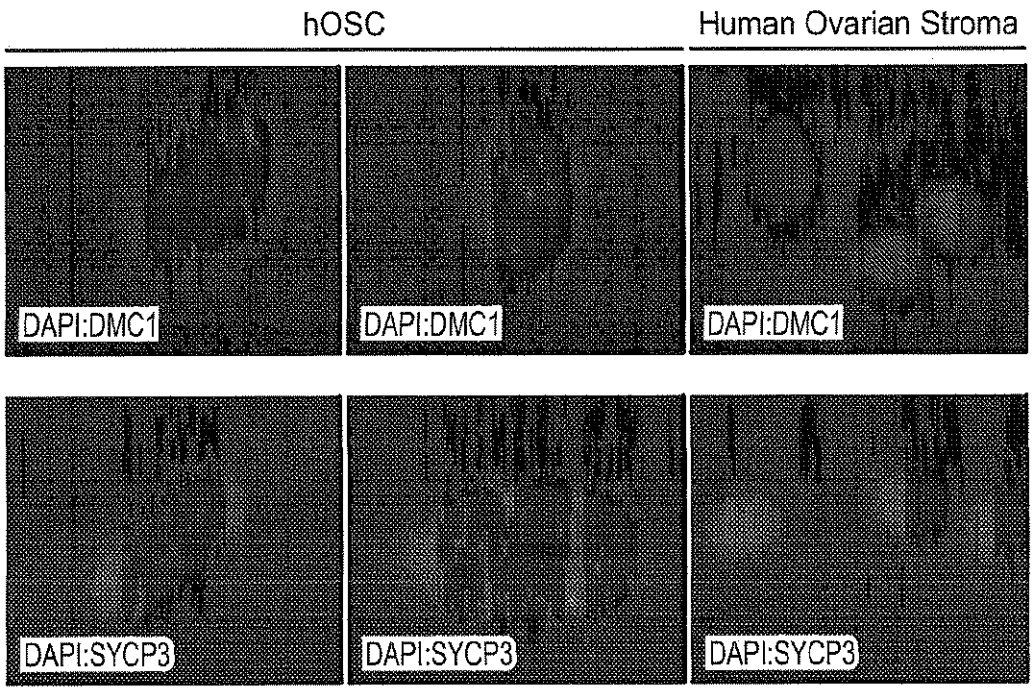

hOSC
Human Ovarian Stroma
DAPI:DMC1
DAPI:DMC1
DAPI:DMC1
DAPI:SYCP3
DAPI:SYCP3
DAPI:SYCP3

FIG. 7H

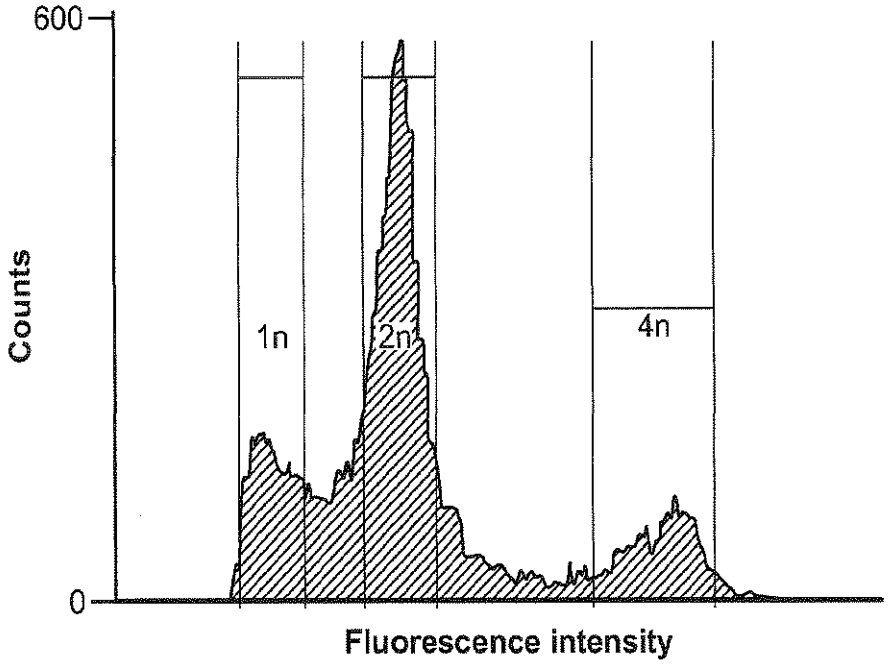

600
0
Counts
1n
2n
4n
Fluorescence intensity

FIG. 7I

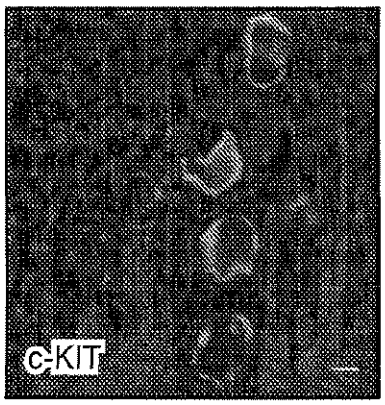


FIG. 8A

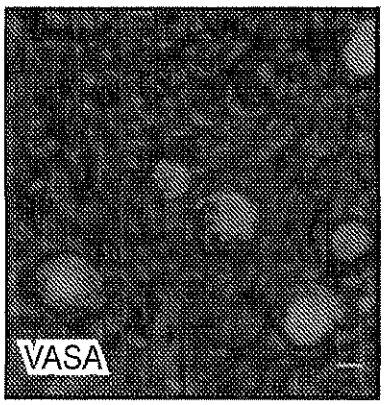


FIG. 8B

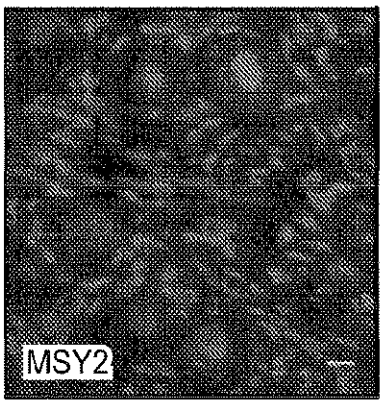


FIG. 8C

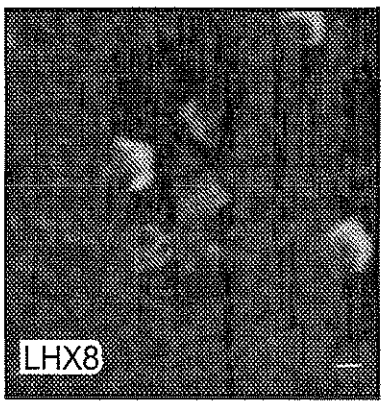


FIG. 8D

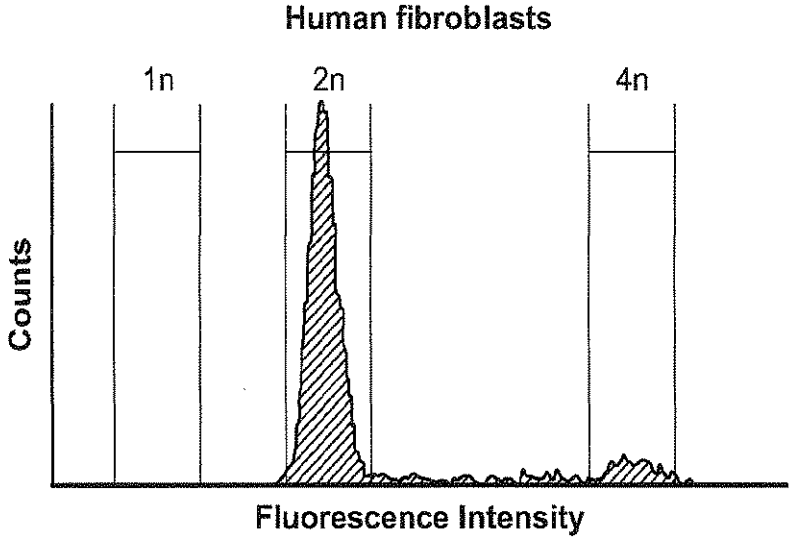

Human fibroblasts
1n
2n
4n
Counts
Fluorescence Intensity

FIG. 9A

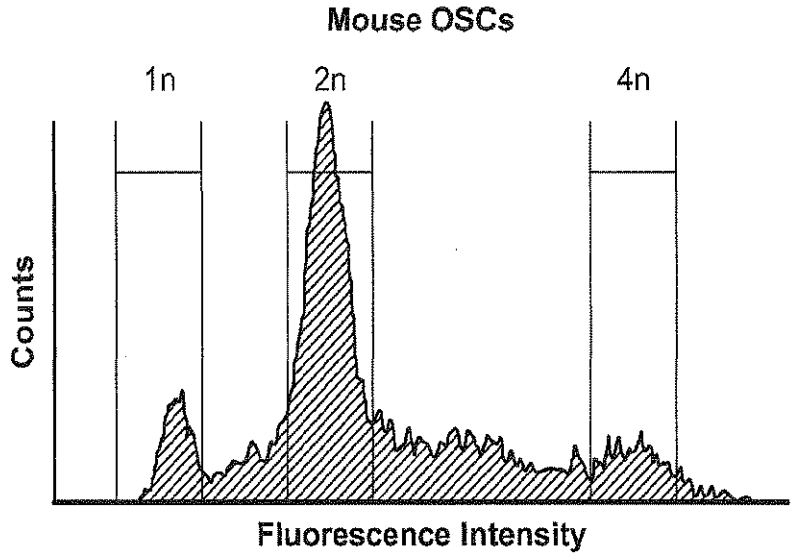

Mouse OSCs
1n
2n
4n
Counts
Fluorescence Intensity

FIG. 9B

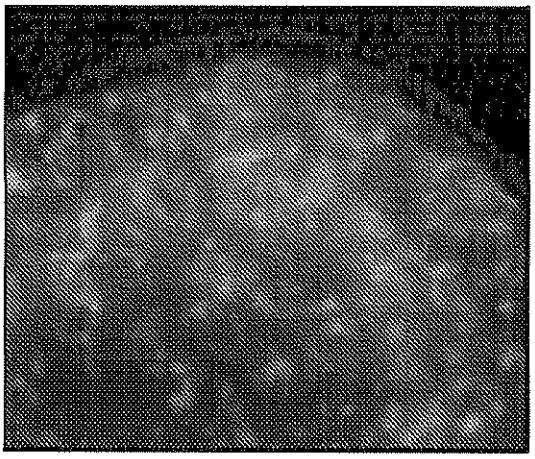


FIG. 10A

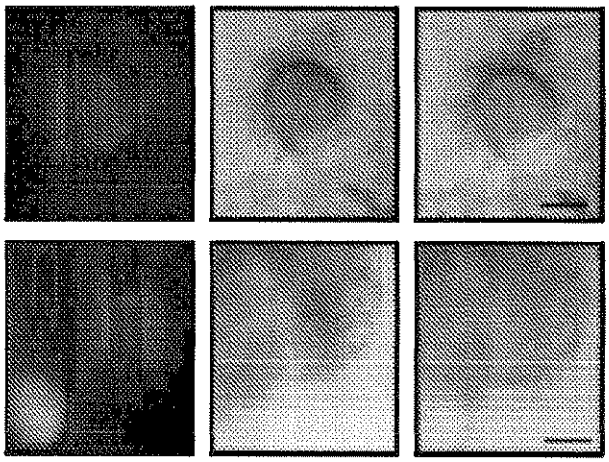


FIG. 10B

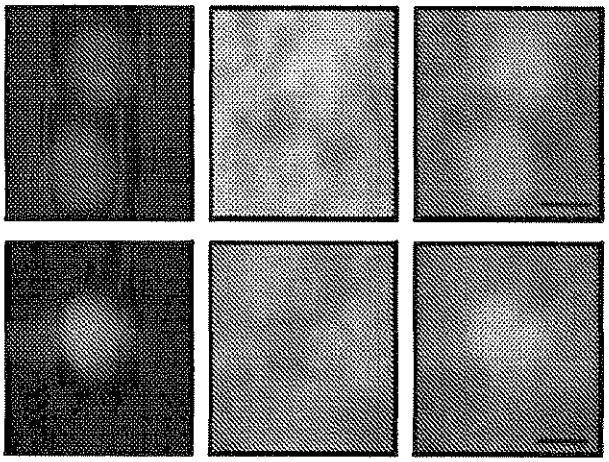


FIG. 10C

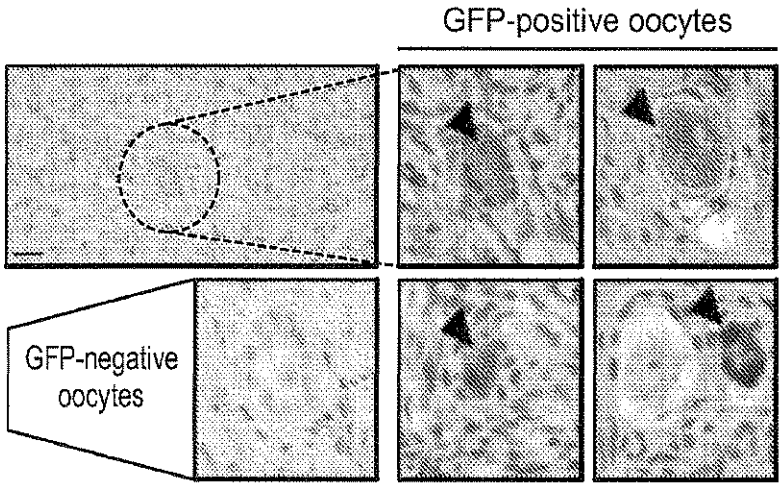


FIG. 10D

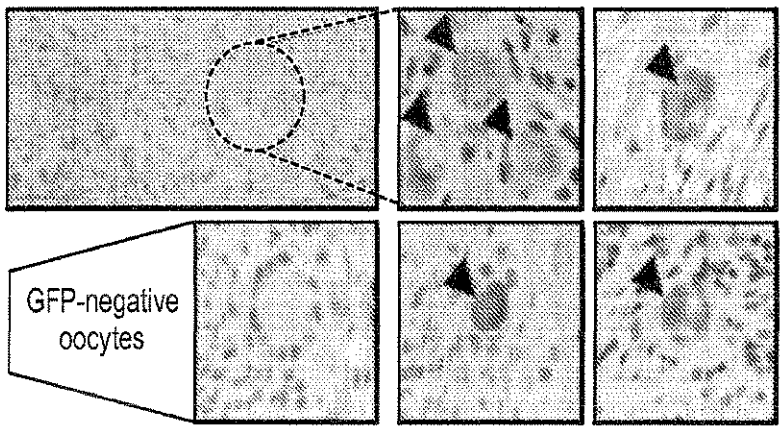


FIG. 10E

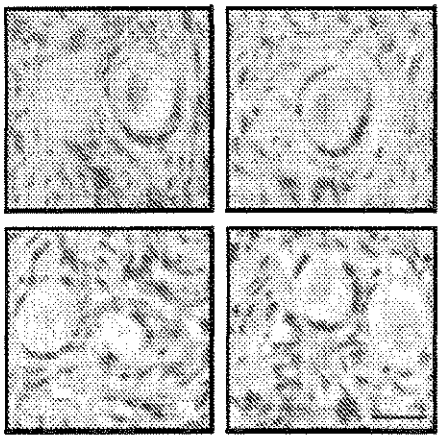


FIG. 10F

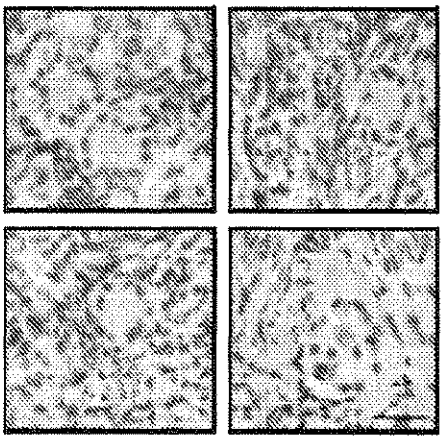


FIG. 10G

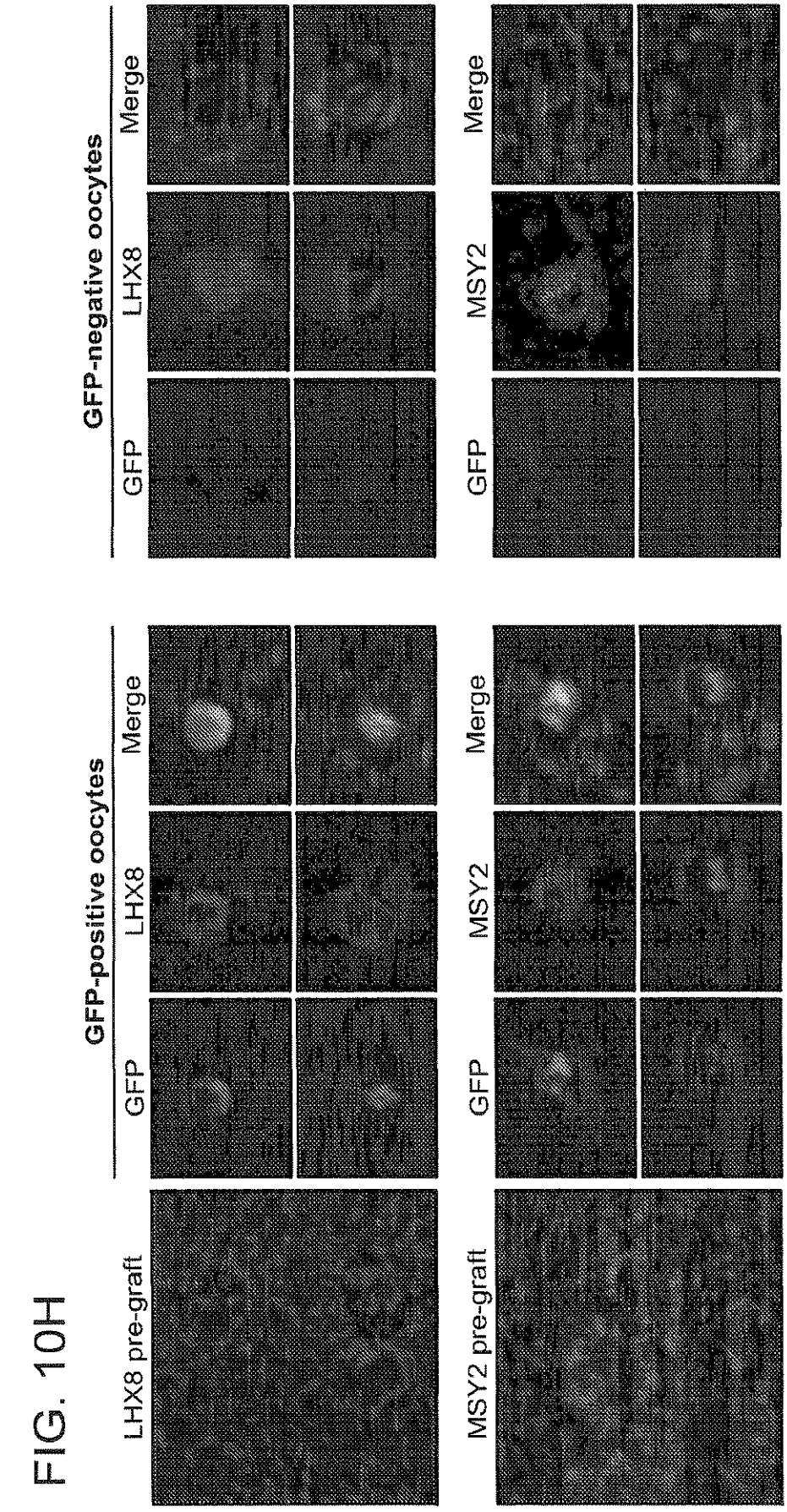

GFP-negative oocytes
GFP
LHX8
Merge
MSY2
GFP-positive oocytes
LHX8 pre-graft
MSY2 pre-graft

FIG. 10H

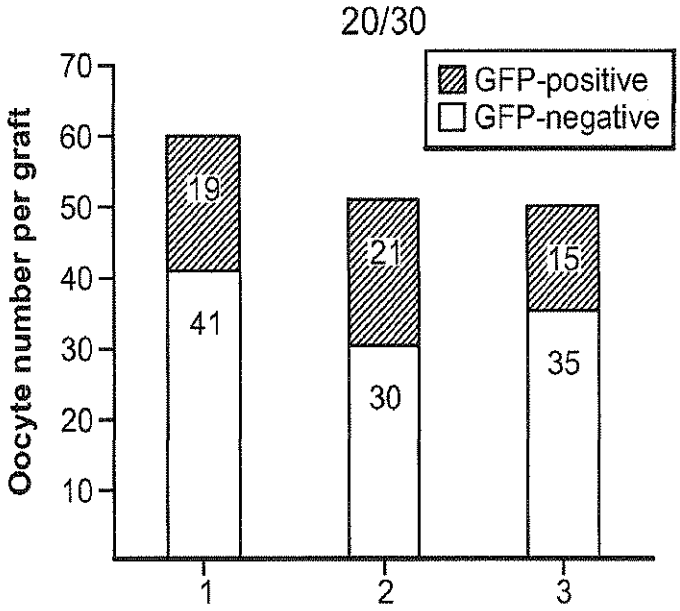


FIG. 11

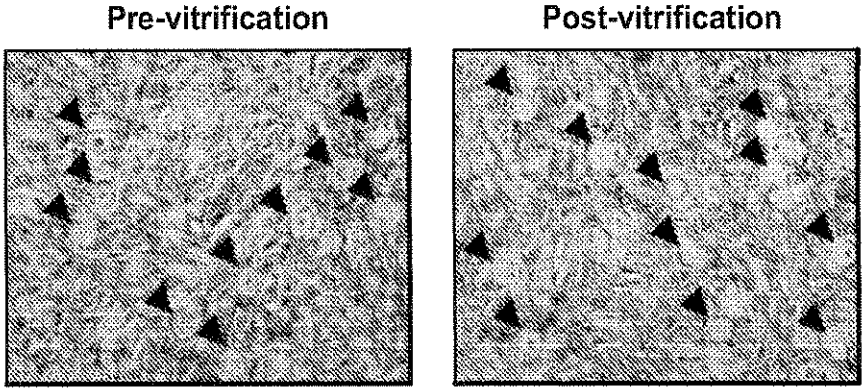


FIG. 12A

FIG. 12B

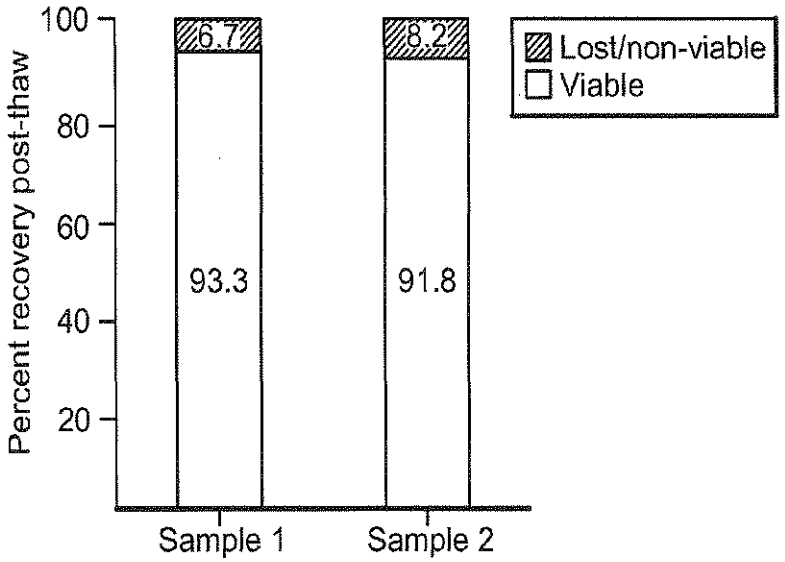


FIG. 12C

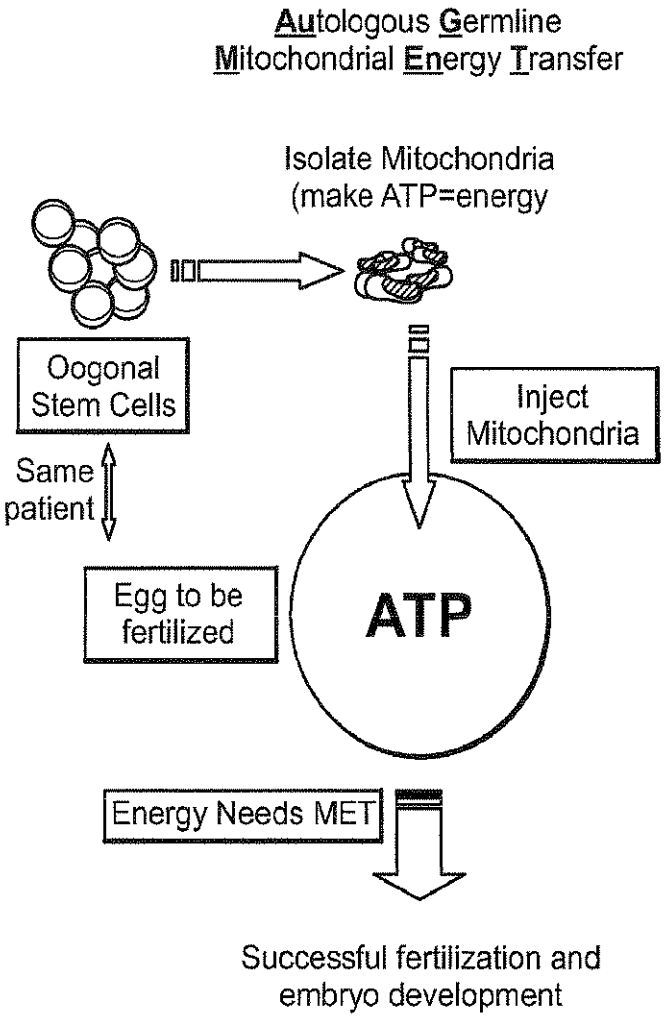

Autologous Germline
Mitochondrial Energy Transfer
Isolate Mitochondria
(make ATP=energy
Oogonal Stem Cells
Same patient
Egg to be fertilized
Inject Mitochondria
ATP
Energy Needs MET
Successful fertilization and embryo development

FIG. 13

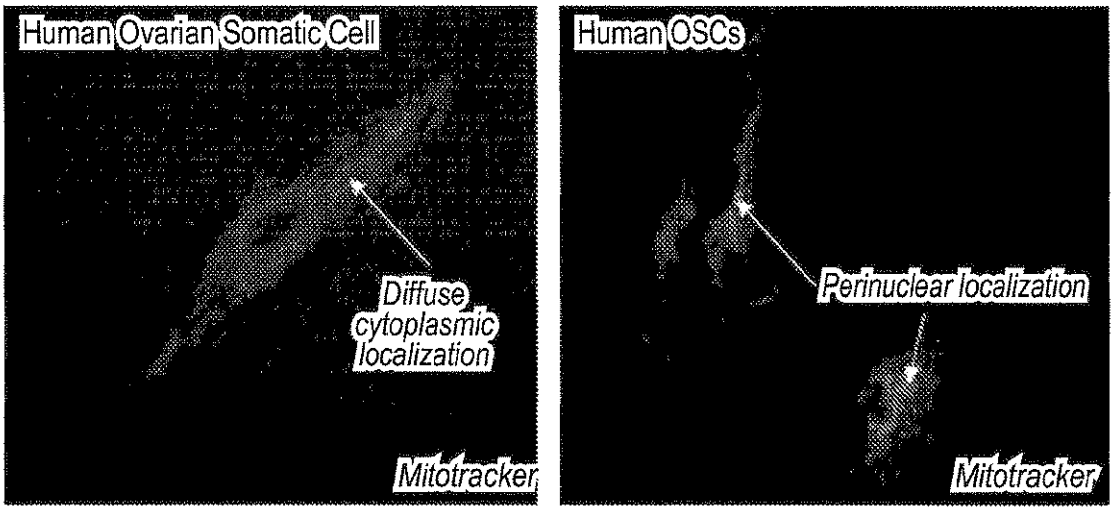

Human Ovarian Somatic Cell
Diffuse cytoplasmic localization
Mitotracker
Human OSCs
Perinuclear localization
Mitotracker

FIG. 14

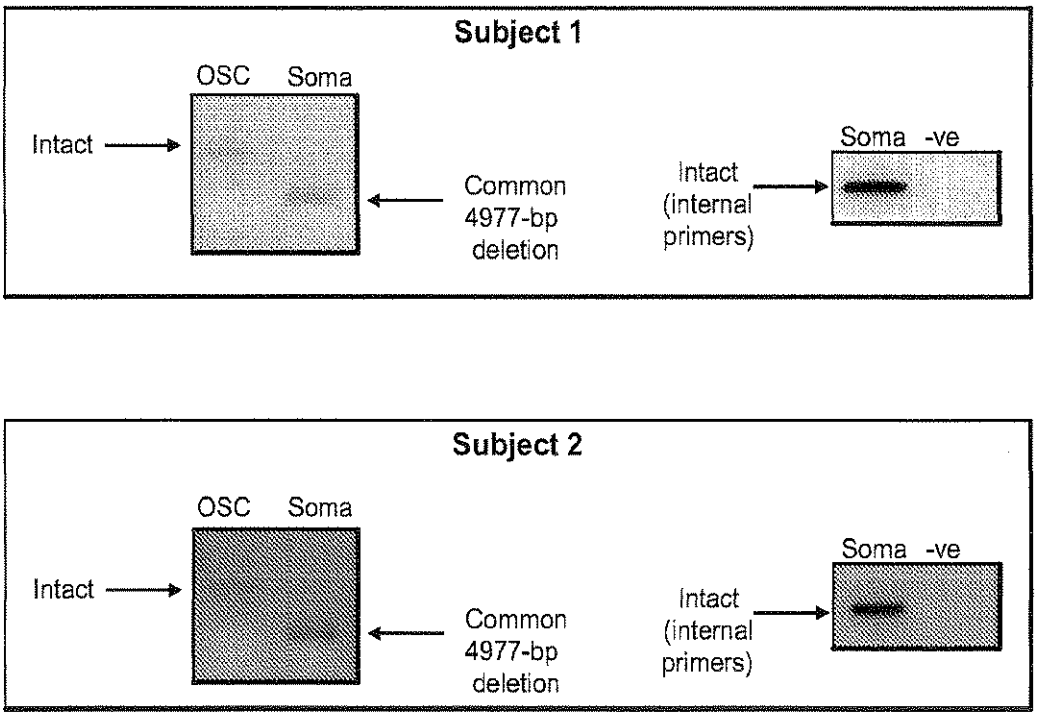

Subject 1
OSC
Soma
Intact
Common
4977-bp
deletion
Intact
(internal
primers)
Soma -ve
Subject 2
OSC
Soma
Intact
Common
4977-bp
deletion
Intact
(internal
primers)
Soma -ve

FIG. 15

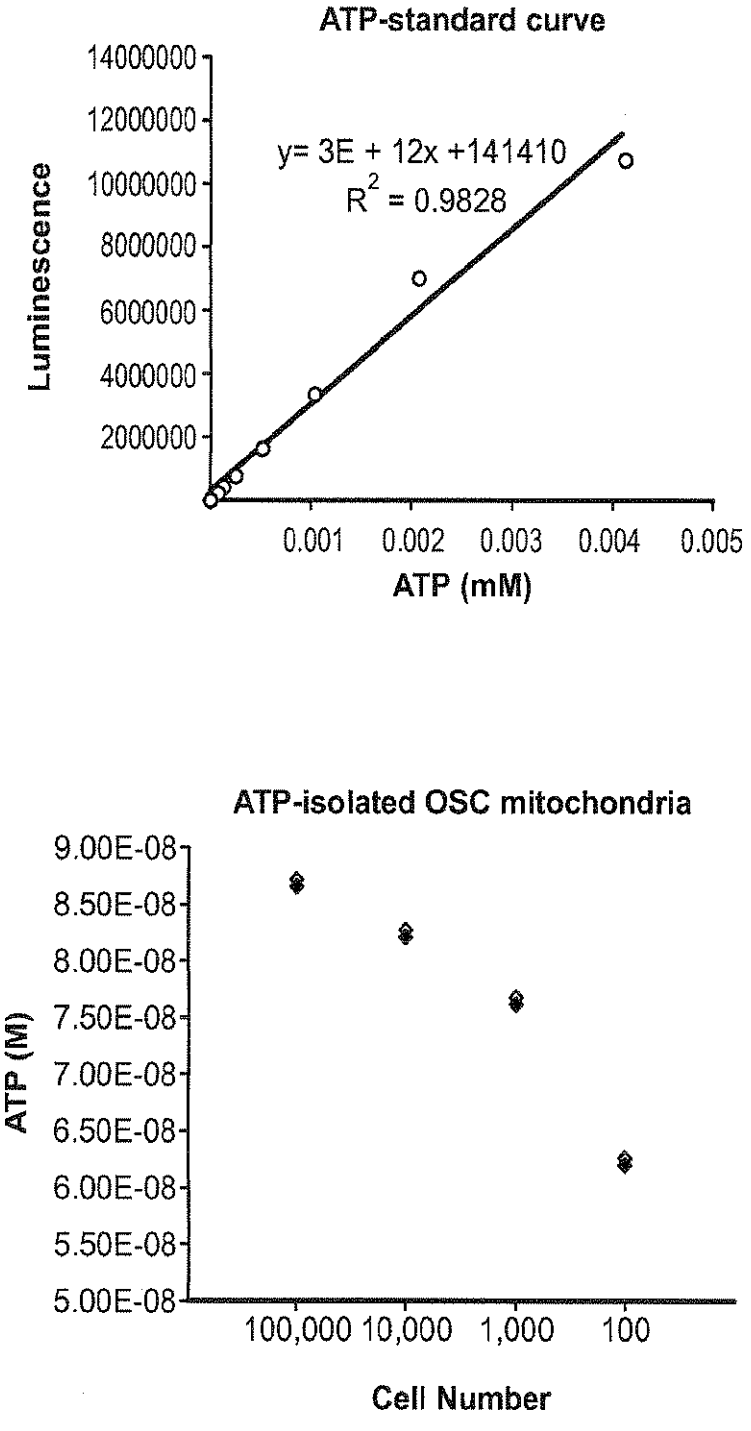

ATP-standard curve
14000000
12000000
10000000
8000000
6000000
4000000
2000000
Luminescence
y= 3E + 12x +141410
R2 = 0.9828
0.001
0.002
0.003
0.004
0.005
ATP (mM)
ATP-isolated OSC mitochondria
9.00E-08
8.50E-08
8.00E-08
7.50E-08
7.00E-08
6.50E-08
6.00E-08
5.50E-08
5.00E-08
ATP (M)
100,000
10,000
1,000
100
Cell Number

FIG. 16

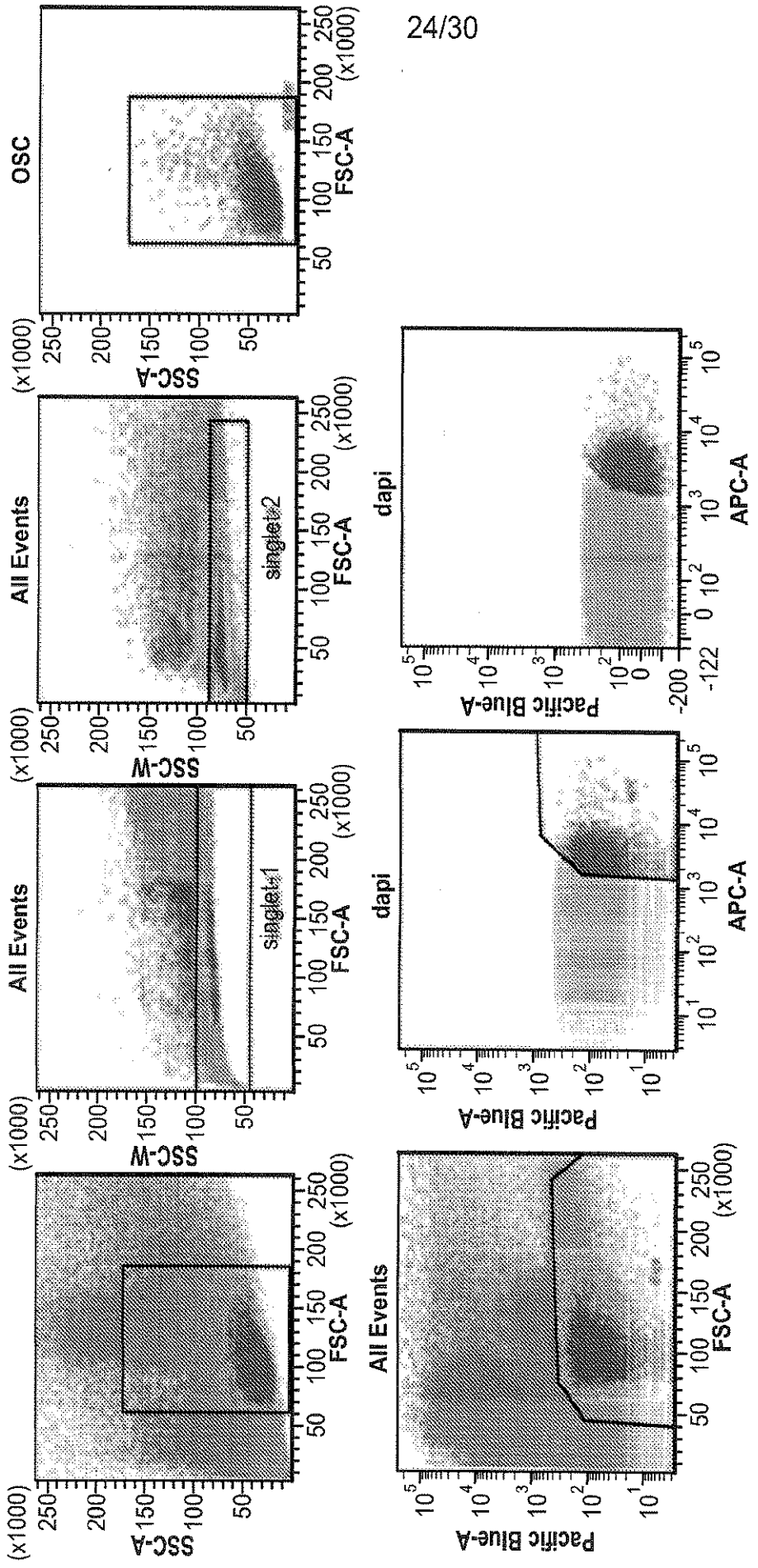


FIG. 17

Example of FACS-based isolation of germ cells from bone marrow mononuclear cell preparations, based on cell-surface expression of VASA

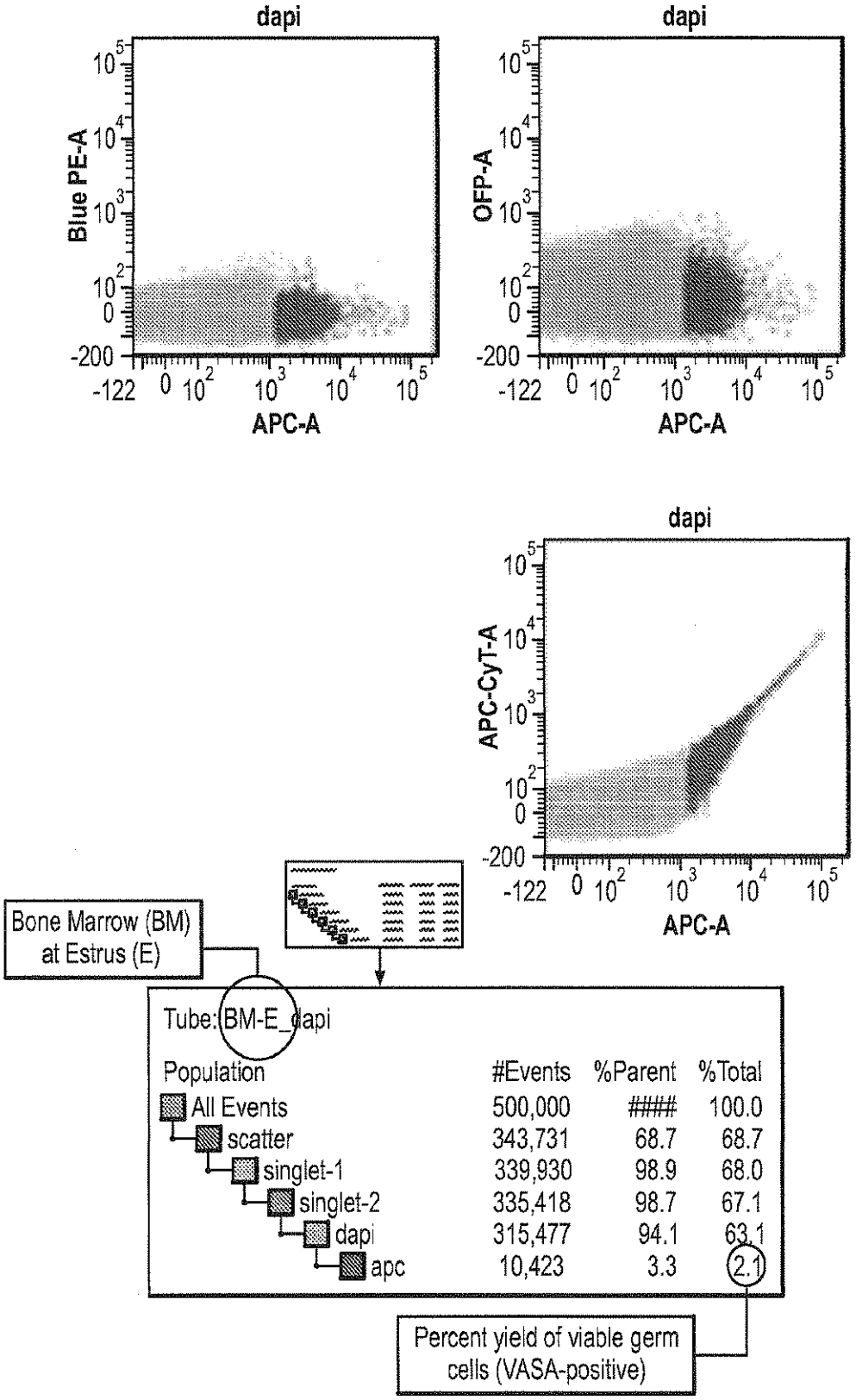

dapi
Blue PE-A
APC-A
dapi
OFP-A
APC-A
dapi
APC-CyT-A
APC-A
Bone Marrow (BM) at Estrus (E)
Tube: BM-E_dapi
Population
#Events
%Parent
%Total
All Events
500,000
####
100.0
scatter
343,731
68.7
68.7
singlet-1
339,930
98.9
68.0
singlet-2
335,418
98.7
67.1
dapi
315,477
94.1
63.1
apc
10,423
3.3
2.1
Percent yield of viable germ cells (VASA-positive)

FIG. 17 Cont.

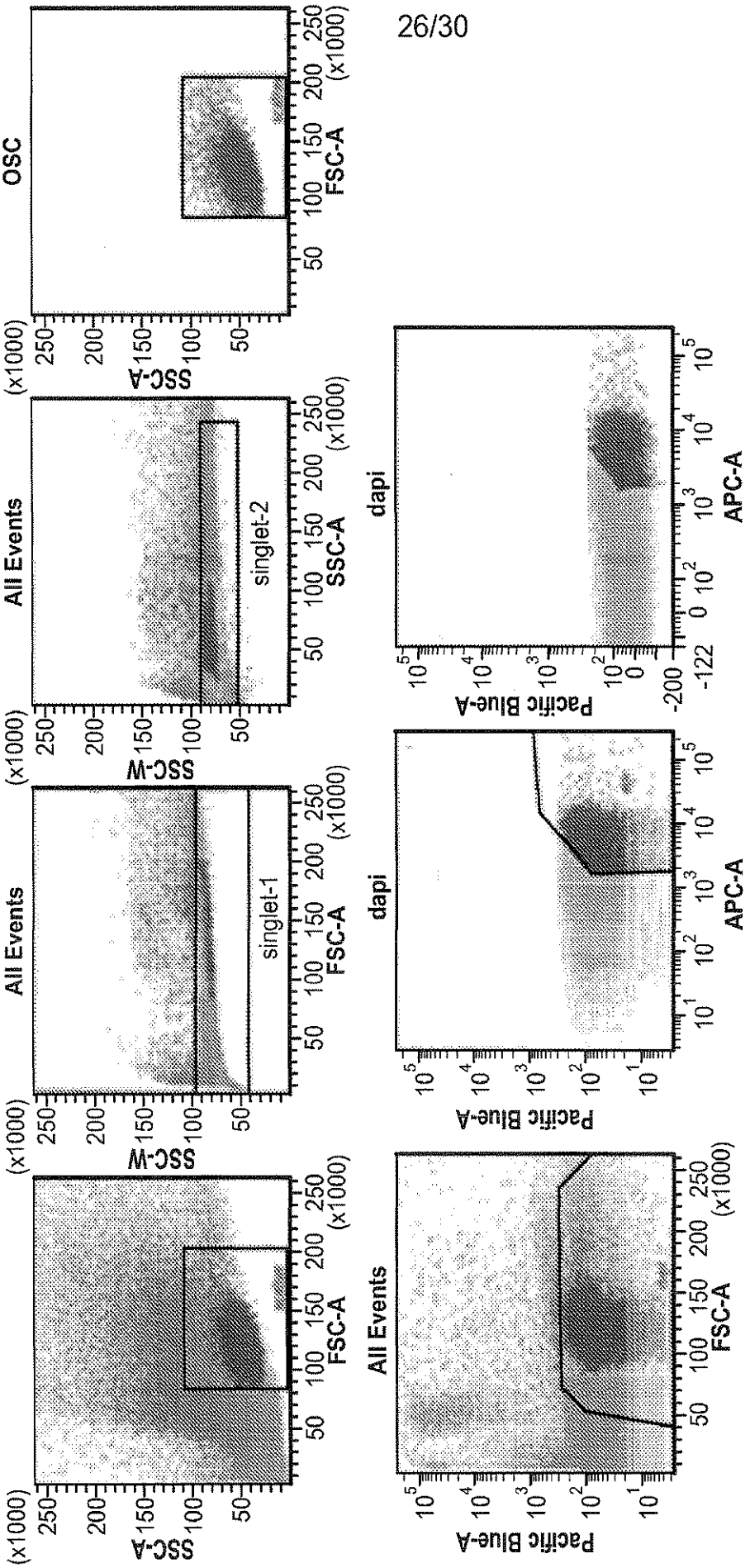


FIG. 18

Example of FACS-based isolation of germ cells from peripheral blood mononuclear cell preparations, based on cell-surface expression of VASA

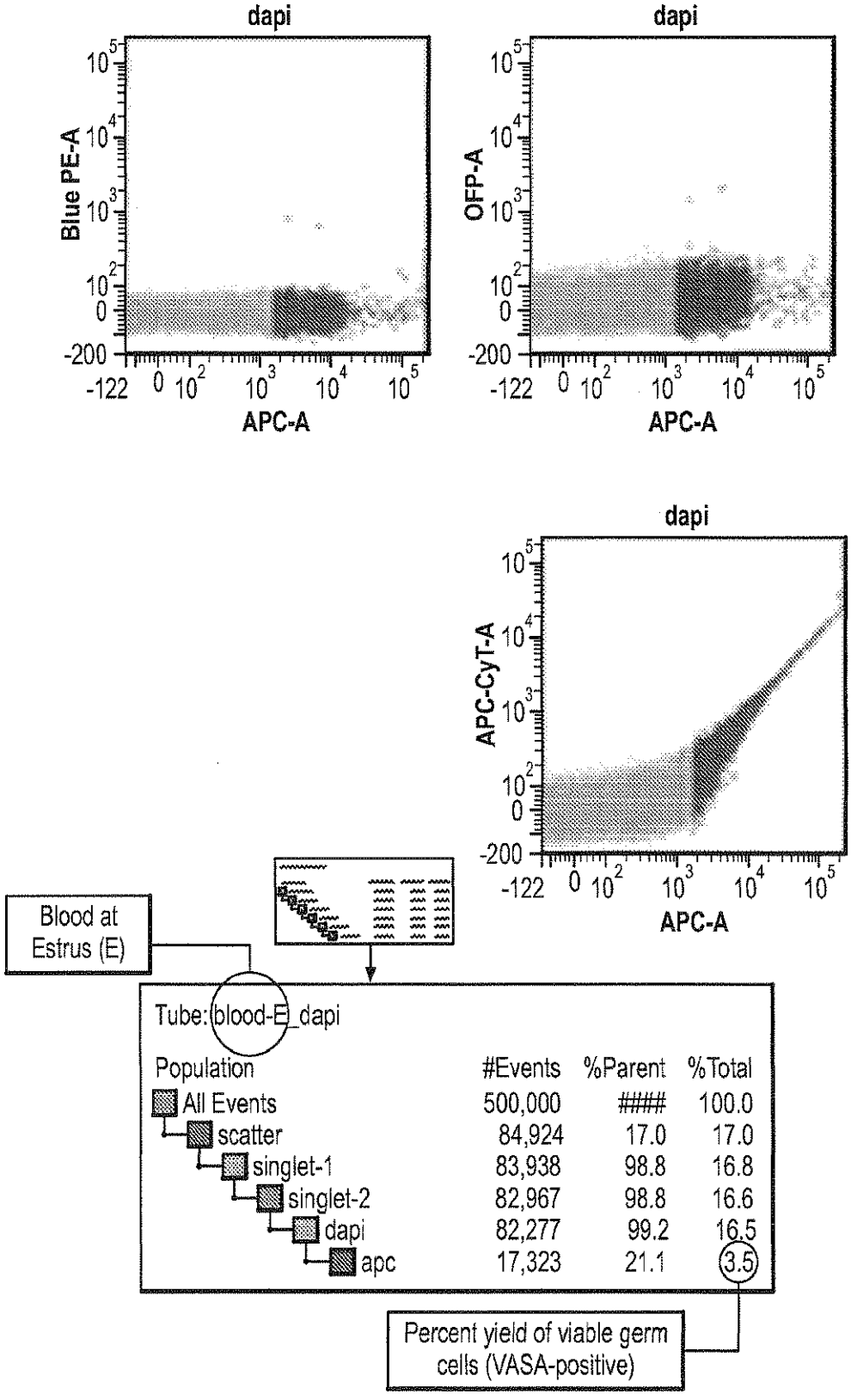

dapi
Blue PE-A
APC-A
dapi
OFP-A
APC-A
dapi
APC-CyT-A
APC-A
Blood at Estrus (E)
Tube: blood-E_dapi
Population #Events %Parent %Total
All Events 500,000 #### 100.0
scatter 84,924 17.0 17.0
singlet-1 83,938 98.8 16.8
singlet-2 82,967 98.8 16.6
dapi 82,277 99.2 16.5
apc 17,323 21.1 3.5
Percent yield of viable germ cells (VASA-positive)

FIG. 18 Cont.

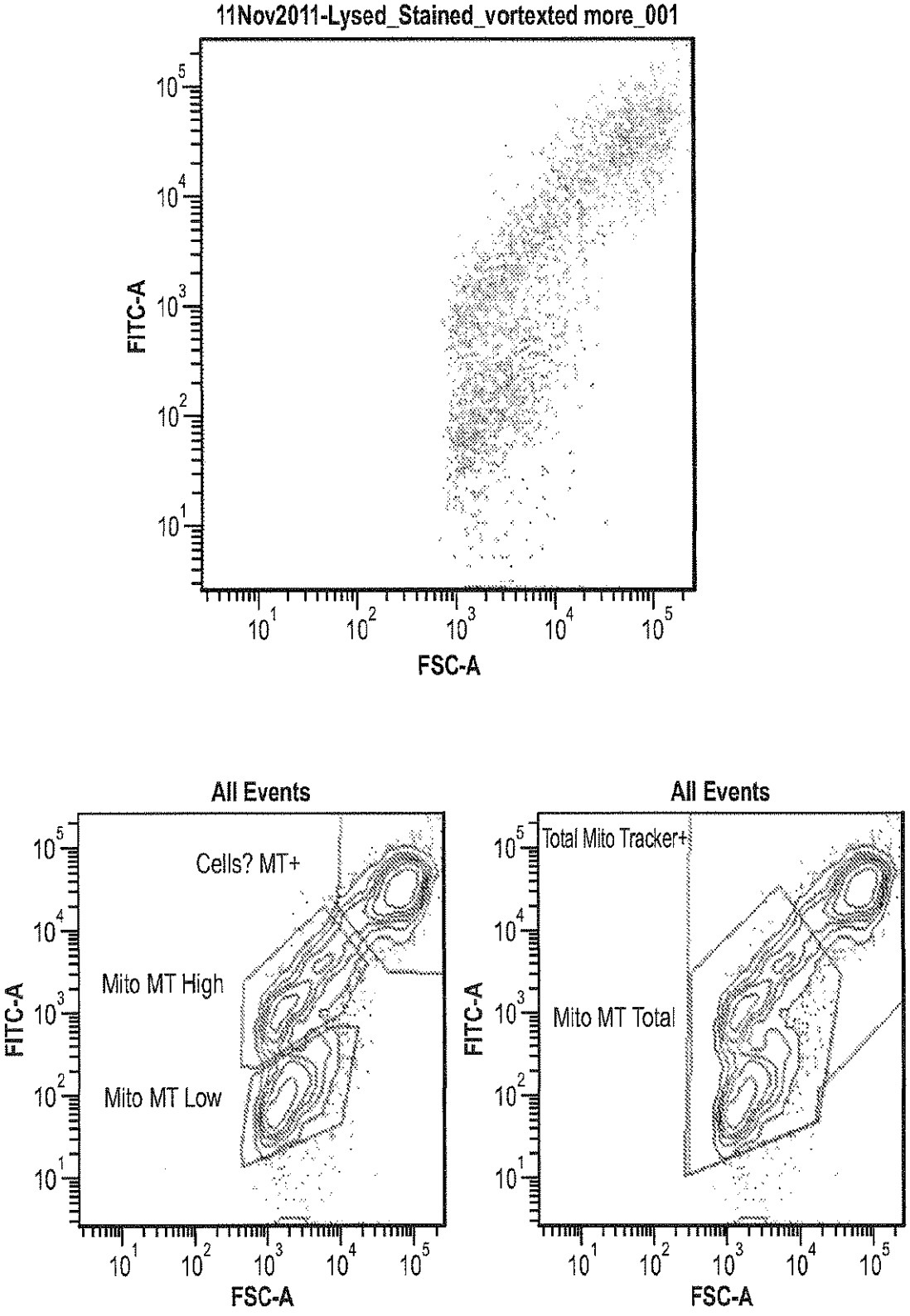

11Nov2011-Lysed_Stained_vortexted more_001
FITC-A
FSC-A
All Events
Cells? MT+
Mito MT High
Mito MT Low
FITC-A
FSC-A
All Events
Total Mito Tracker+
Mito MT Total
FITC-A
FSC-A

FIG. 19

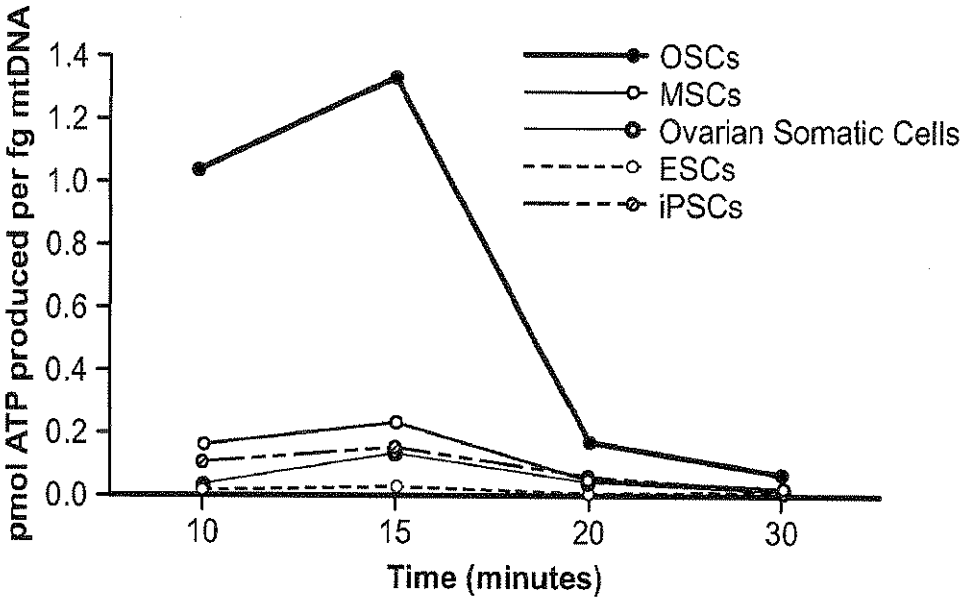

pmol ATP produced per fg mtDNA
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
10
15
20
30
Time (minutes)
OSCs
MSCs
Ovarian Somatic Cells
ESCs
iPSCs

FIG. 20

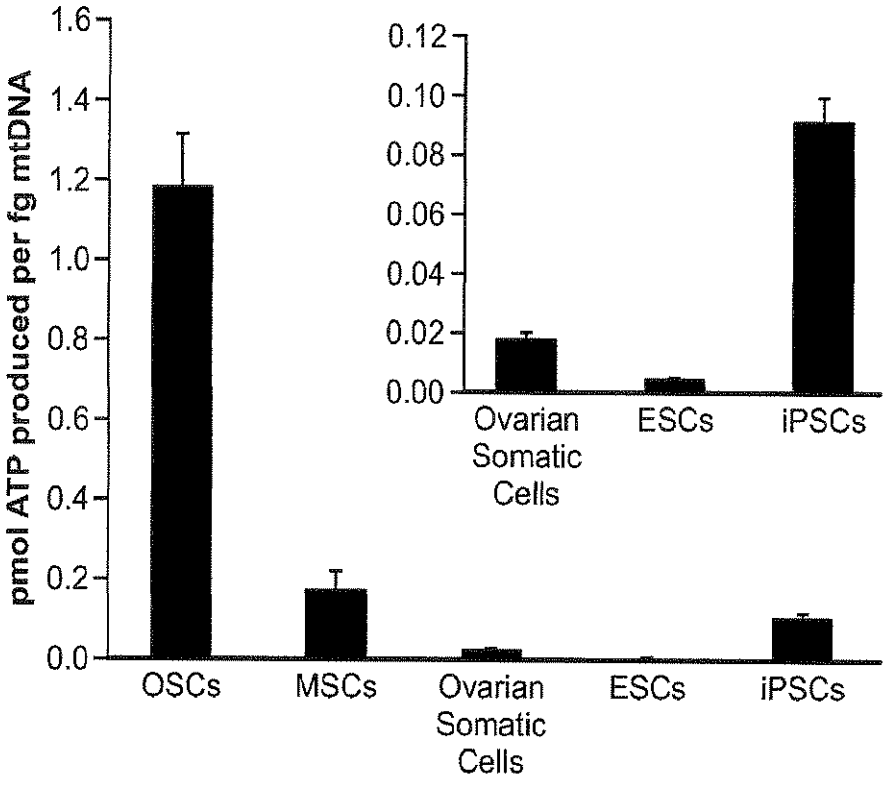

pmol ATP produced per fg mtDNA
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
OSCs
MSCs
Ovarian Somatic Cells
ESCs
iPSCs
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Ovarian Somatic Cells
ESCs
iPSCs

FIG. 21

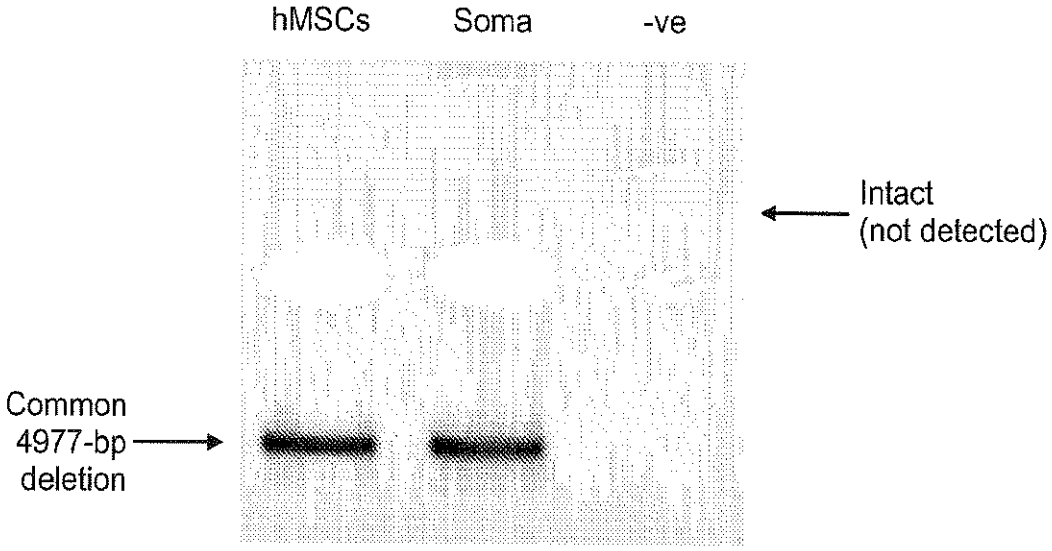


FIG. 22