FIGURE 1A

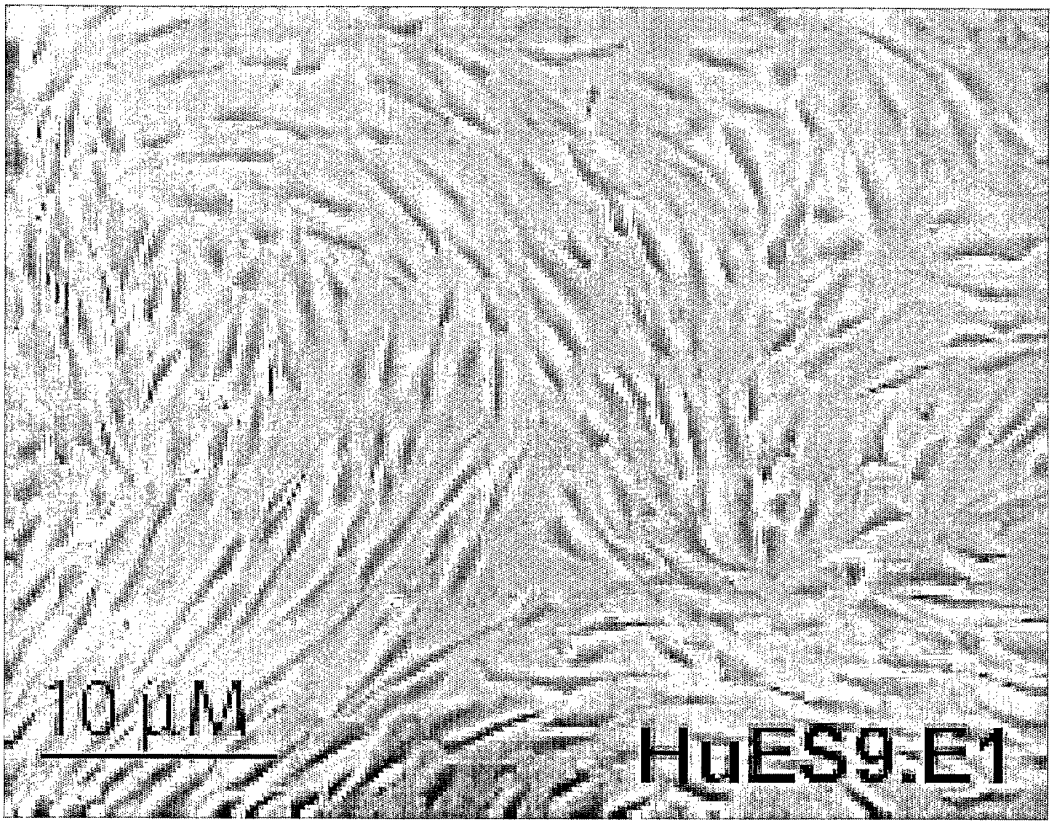


FIGURE 1B

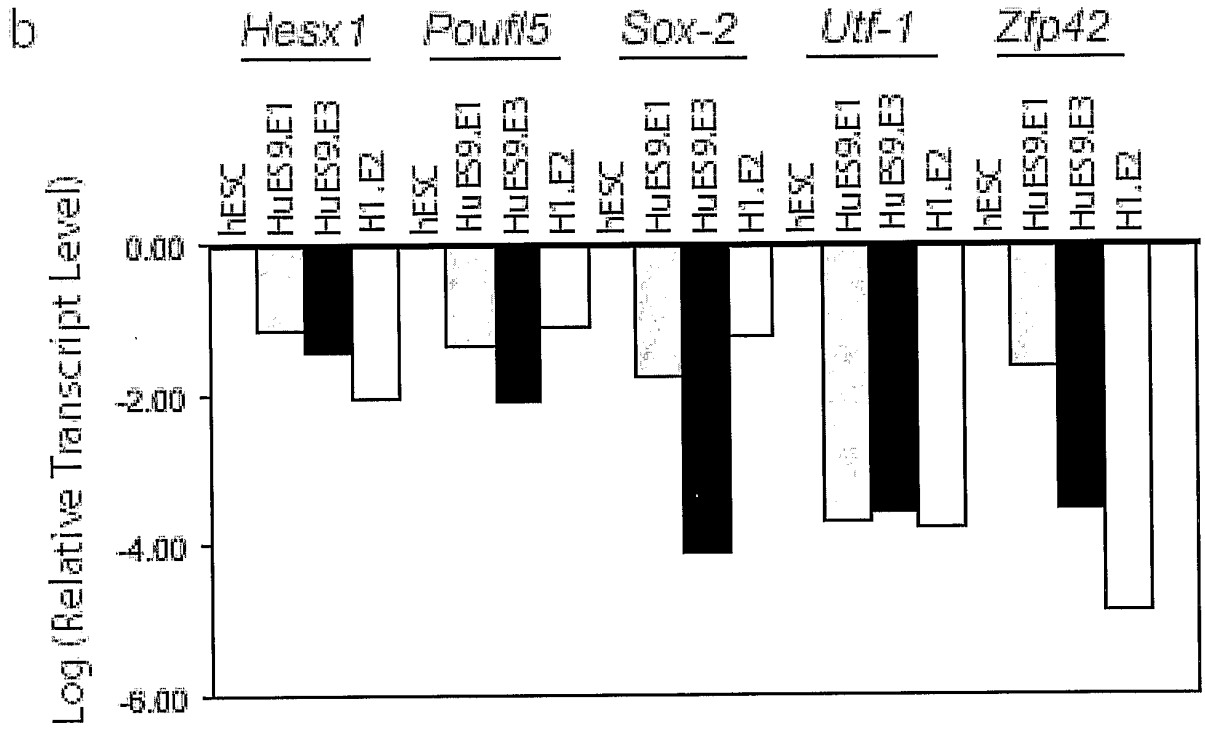

b
Hesx1
Pouf5
Sox-2
Utf-1
Zfp42
hESC
HuES9.E1
HuES9.E3
H1.E2
Log (Relative Transcript Level)
0.00
-2.00
-4.00
-6.00

FIGURE 1C

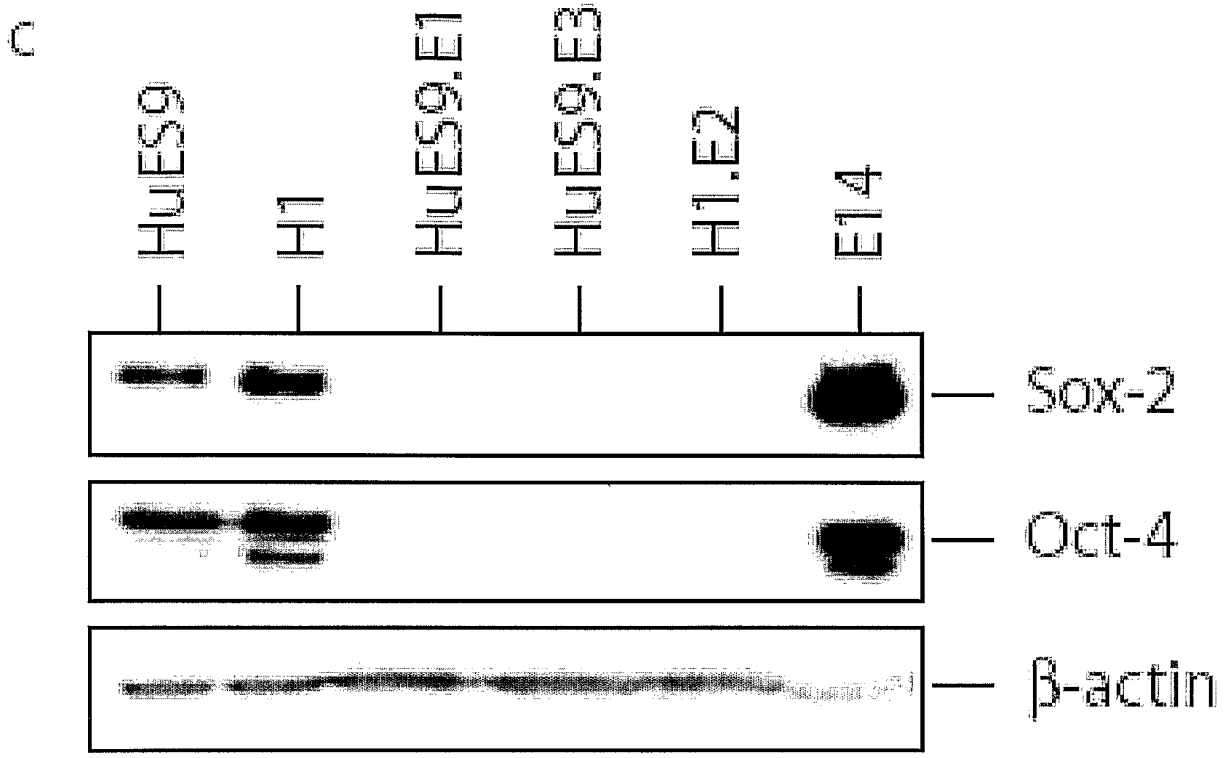


FIGURE 1D

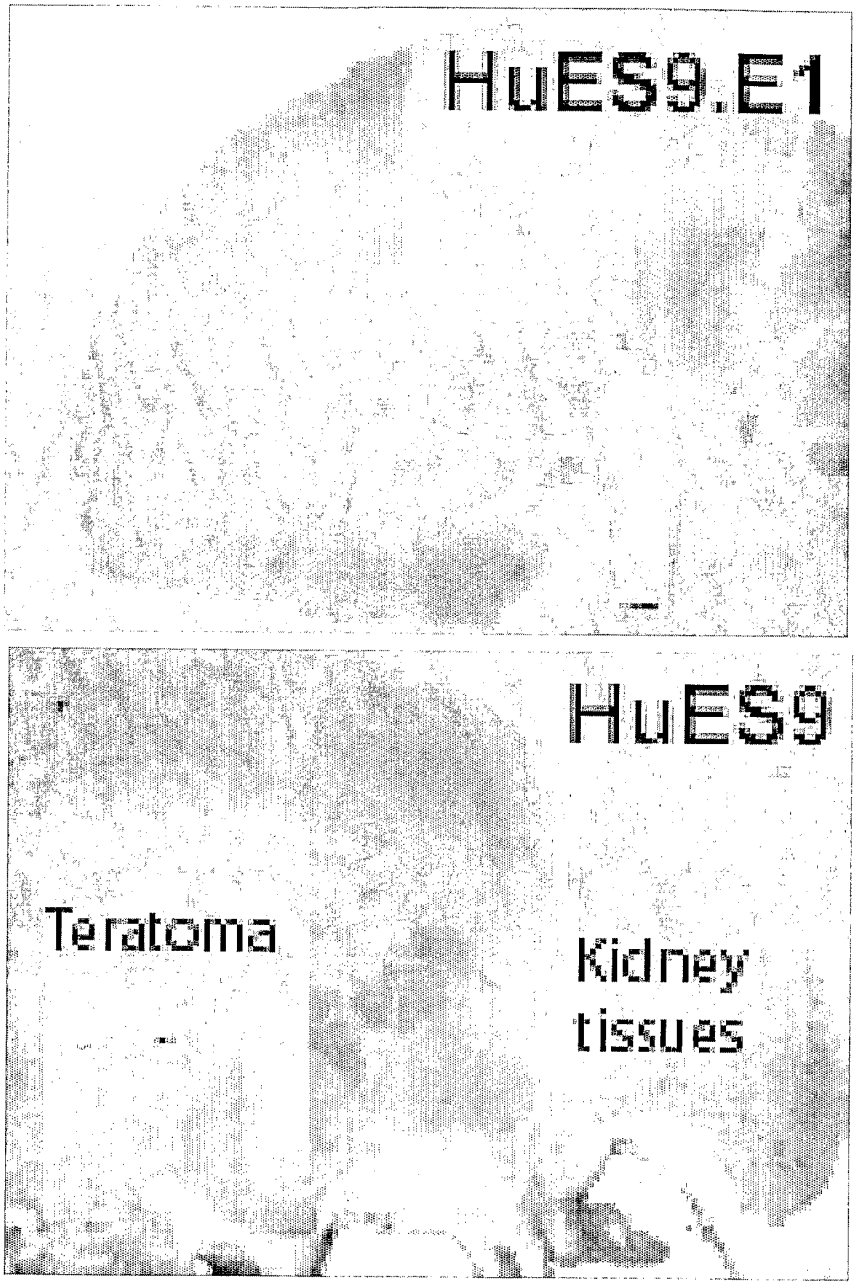


FIGURE 1E

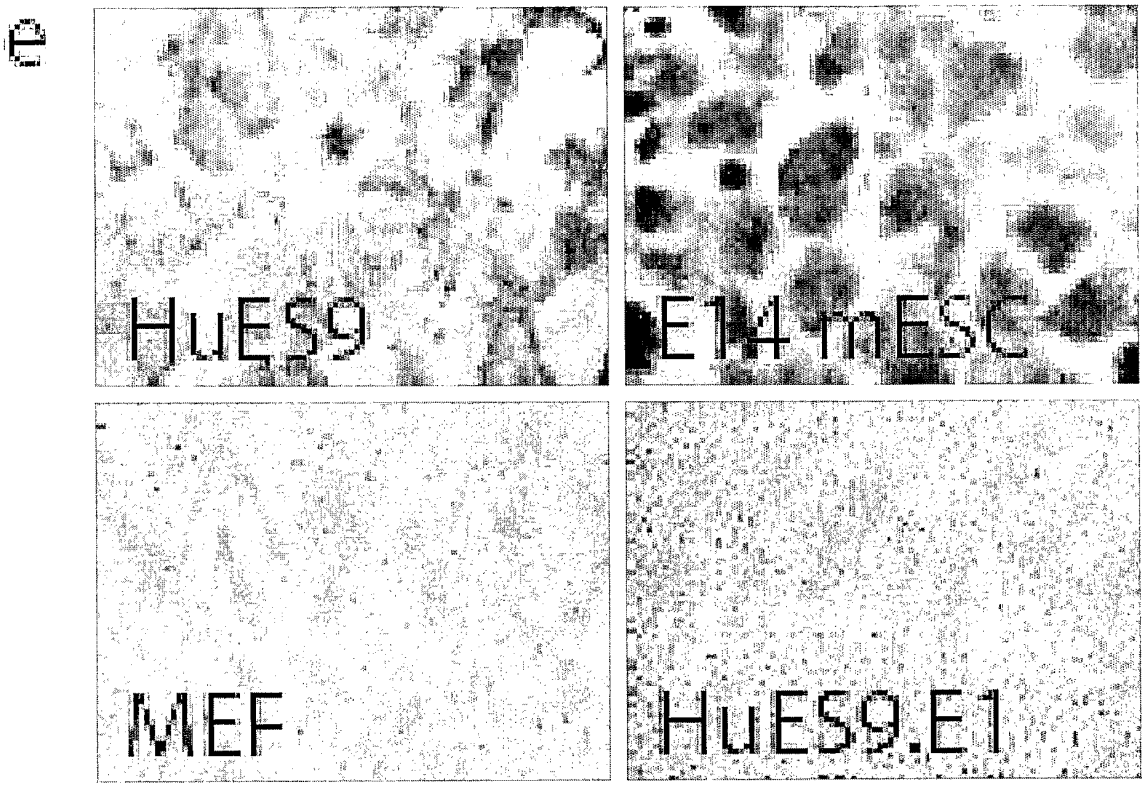


FIGURE 1F

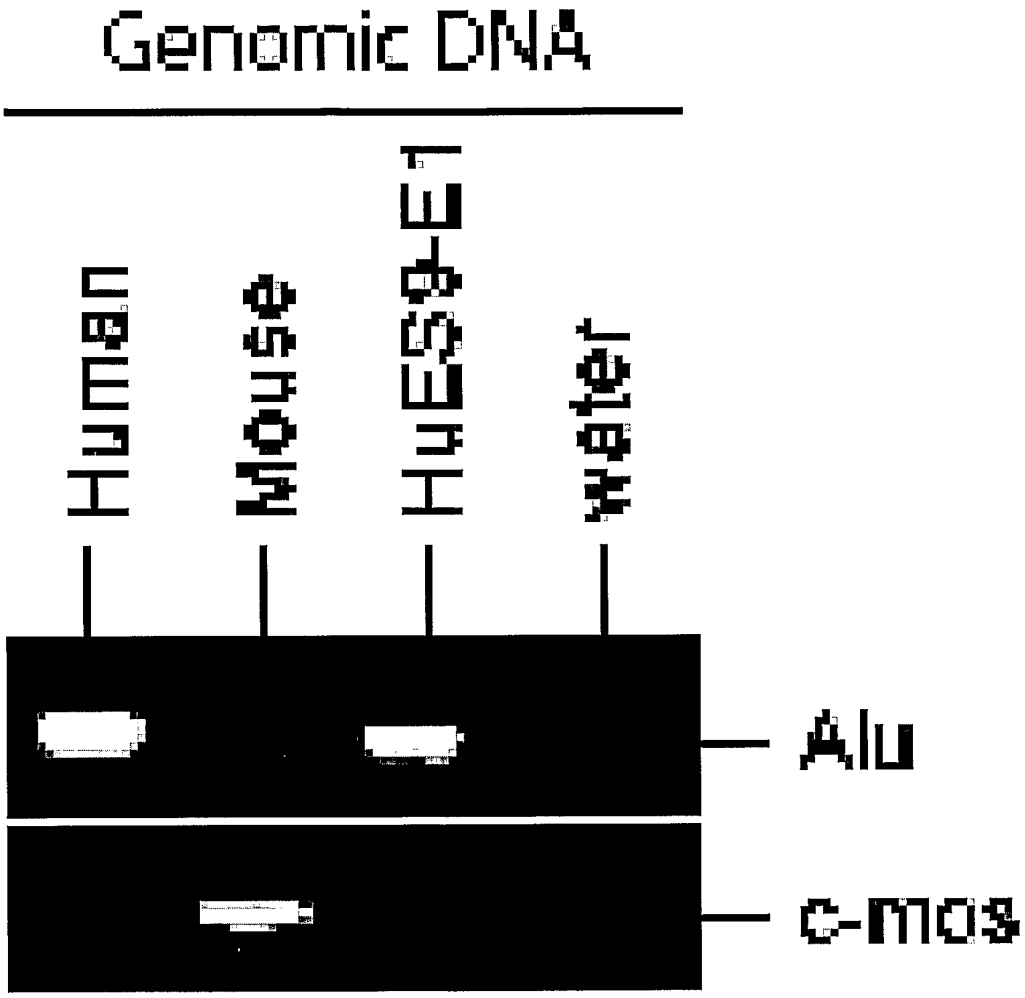


FIGURE 1G

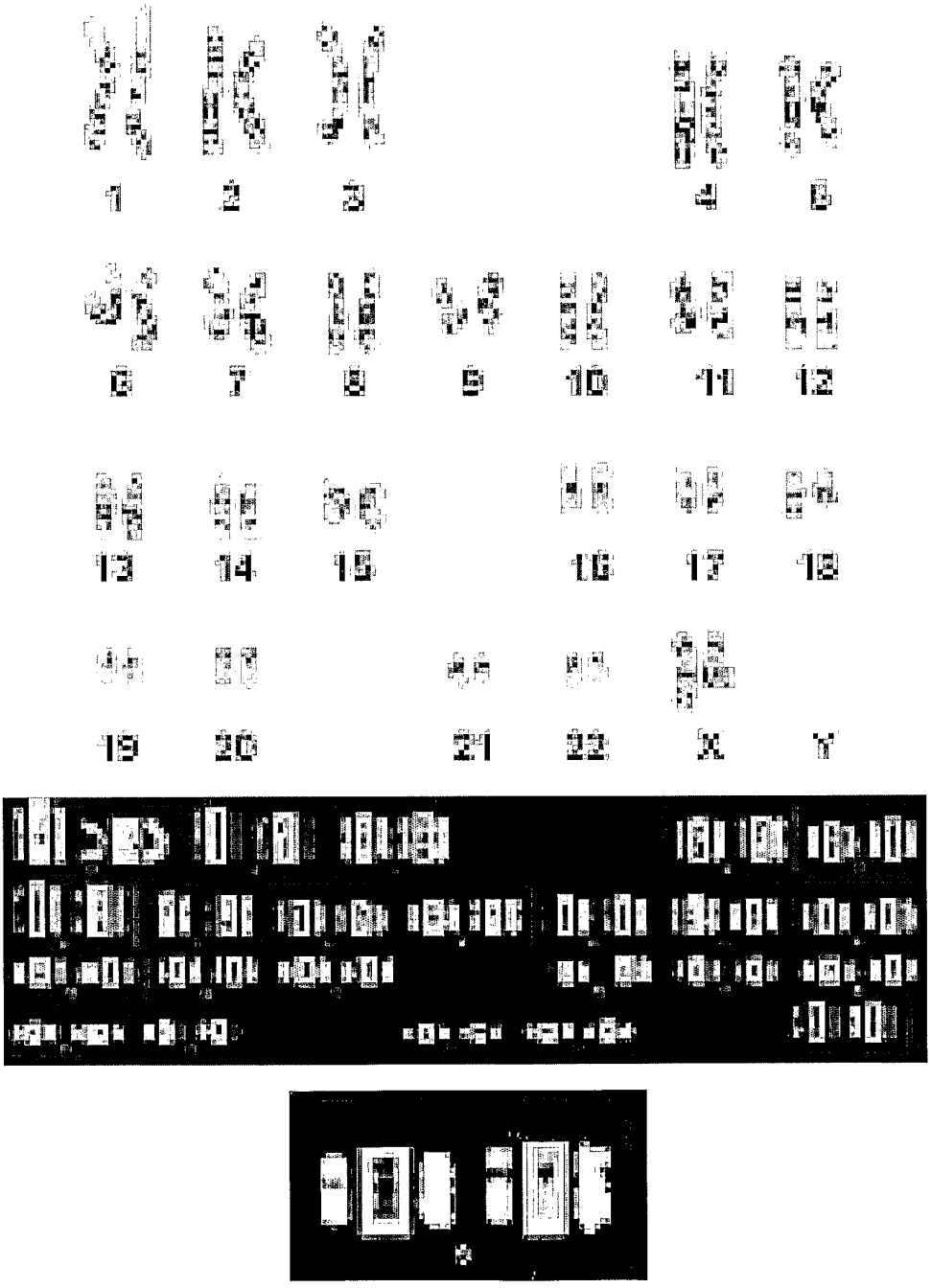


FIGURE 2A

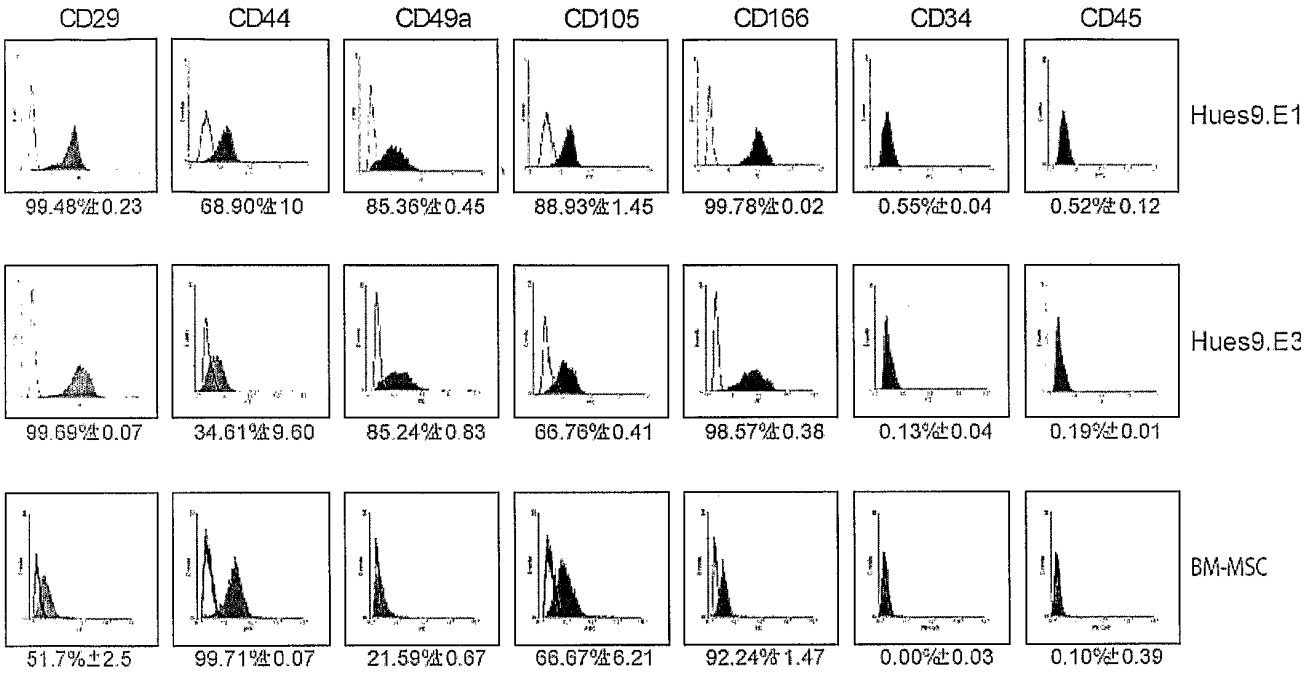

CD29
CD44
CD49a
CD105
CD166
CD34
CD45
Hues9.E1
99.48%±0.23
68.90%±10
85.36%±0.45
88.93%±1.45
99.78%±0.02
0.55%±0.04
0.52%±0.12
Hues9.E3
99.69%±0.07
34.61%±9.60
85.24%±0.83
66.76%±0.41
98.57%±0.38
0.13%±0.04
0.19%±0.01
BM-MSC
51.7%±2.5
99.71%±0.07
21.59%±0.67
66.67%±6.21
92.24%±1.47
0.00%±0.03
0.10%±0.39

FIGURE 2B

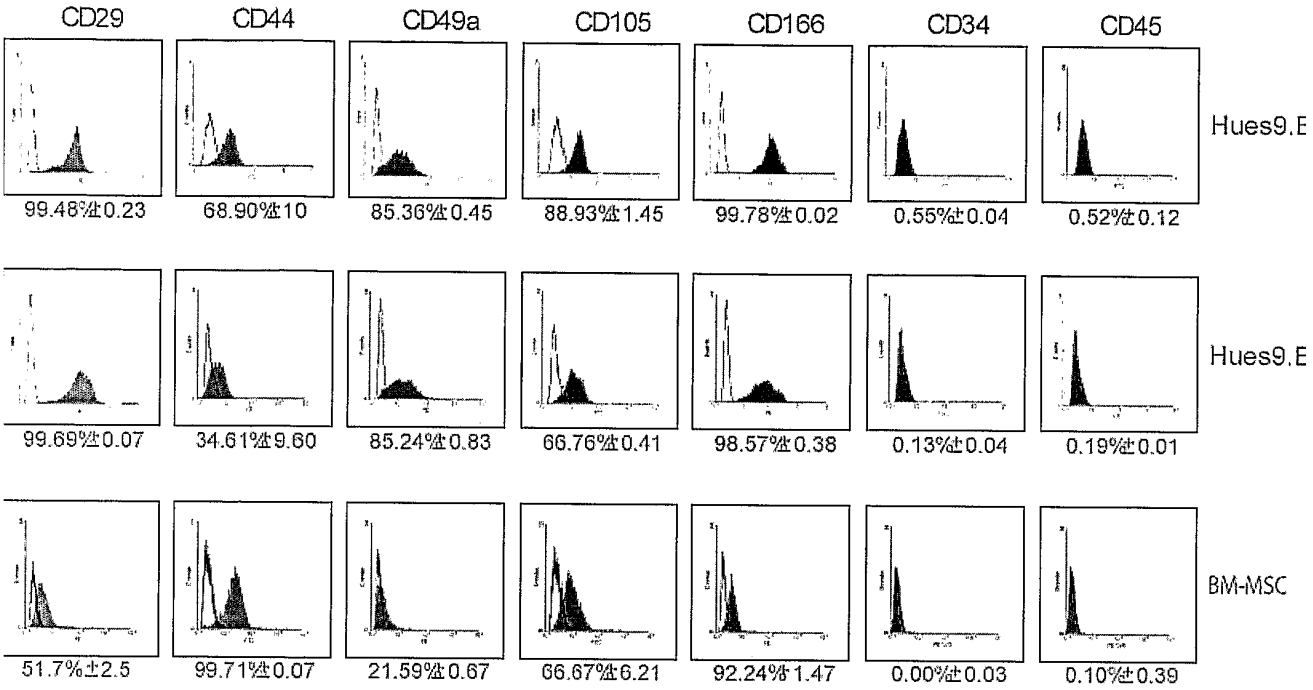

CD29
CD44
CD49a
CD105
CD166
CD34
CD45
99.48%±0.23
68.90%±10
85.36%±0.45
88.93%±1.45
99.78%±0.02
0.55%±0.04
0.52%±0.12
Hues9.E
99.69%±0.07
34.61%±9.60
85.24%±0.83
66.76%±0.41
98.57%±0.38
0.13%±0.04
0.19%±0.01
Hues9.E
51.7%±2.5
99.71%±0.07
21.59%±0.67
66.67%±6.21
92.24%±1.47
0.00%±0.03
0.10%±0.39
BM-MSC

FIGURE 3A

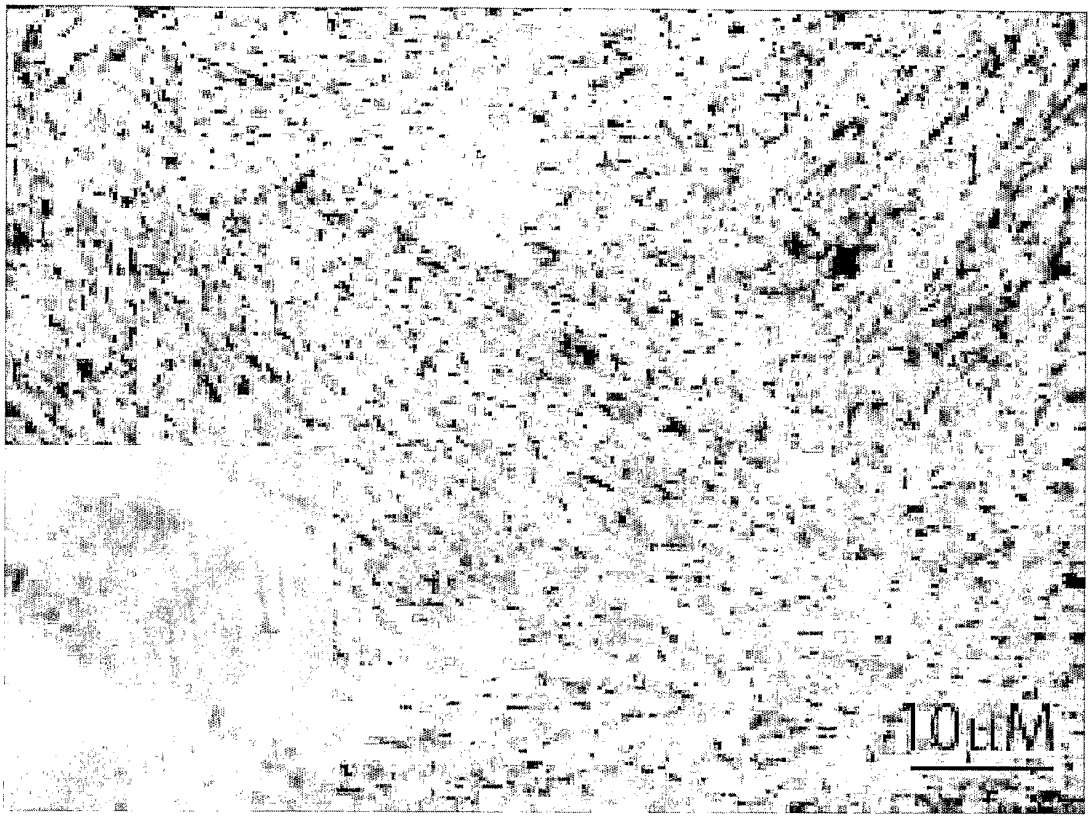


FIGURE 3A (CONTINUED)

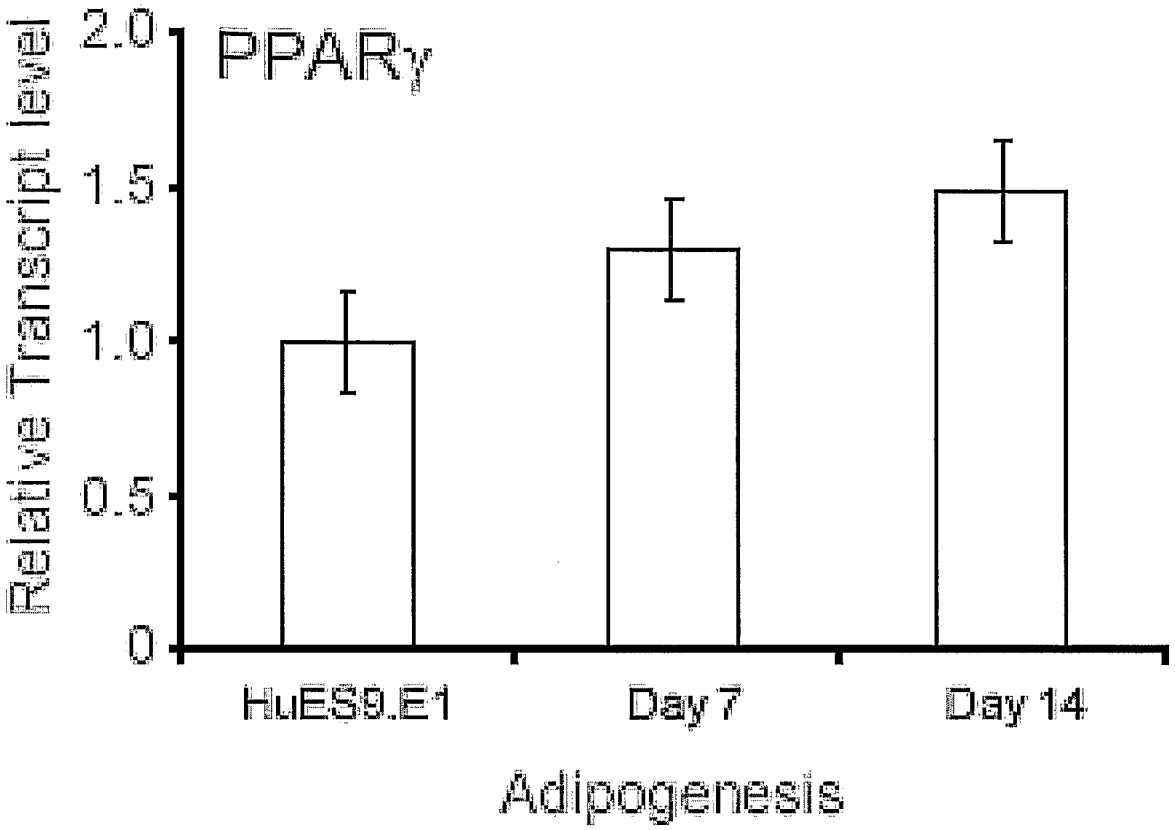


FIGURE 3A (CONTINUED)

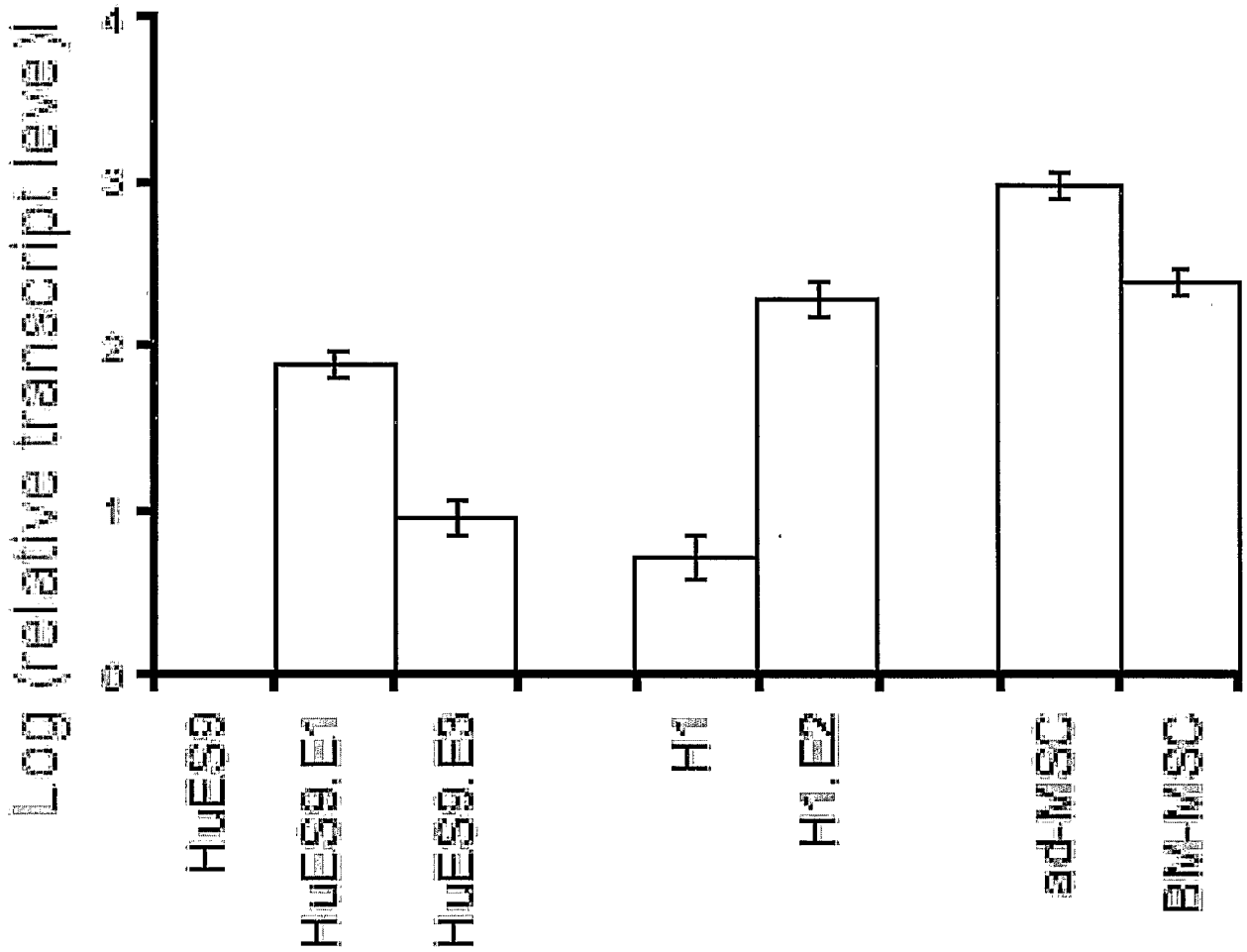


FIGURE 3B

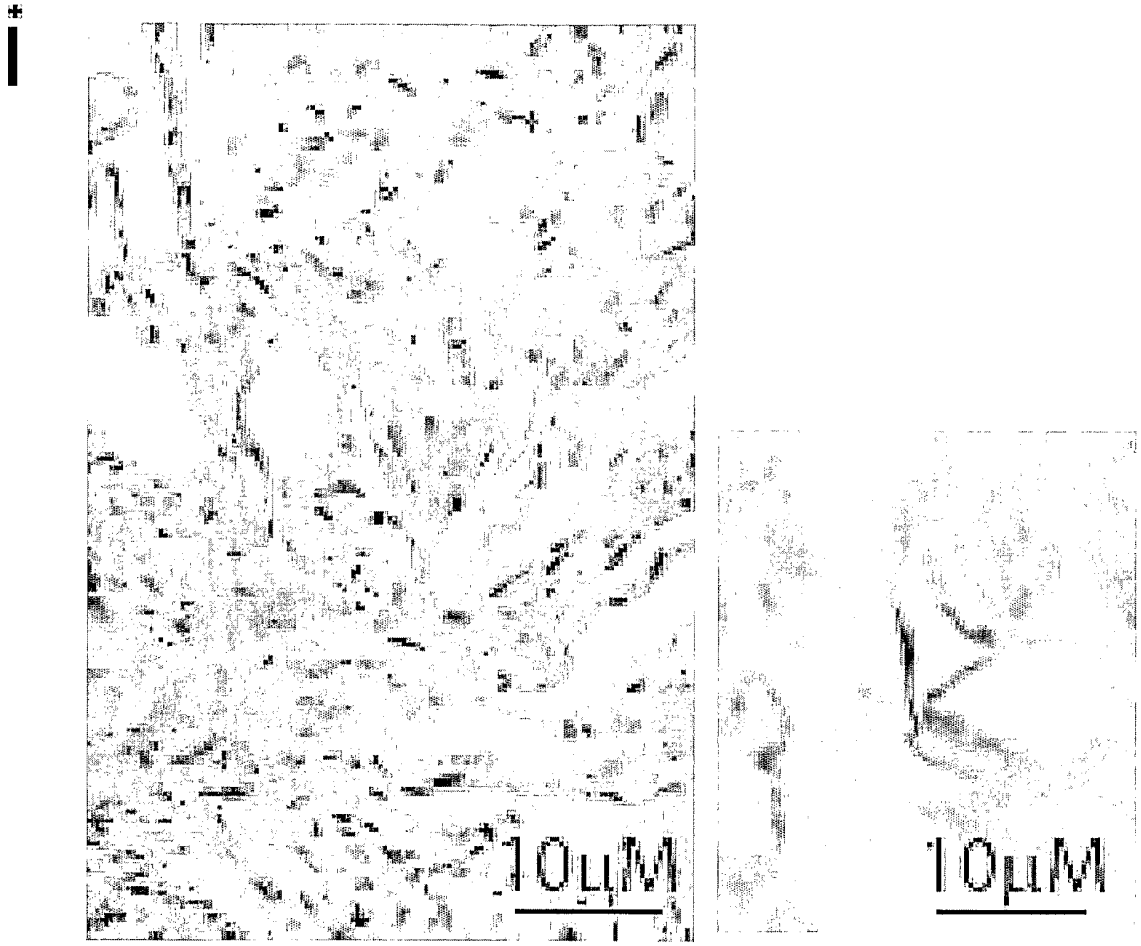


FIGURE 3B (CONTINUED)

ii

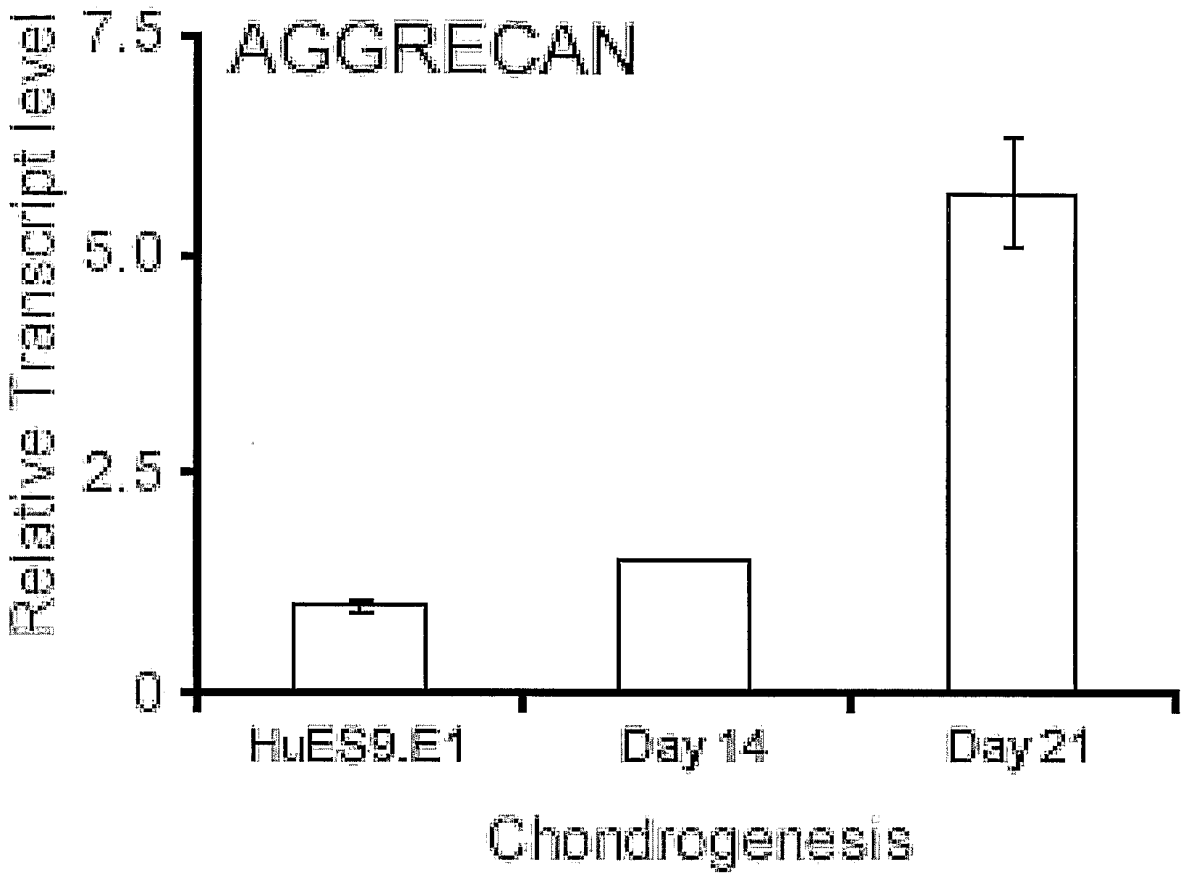


FIGURE 3B (CONTINUED)

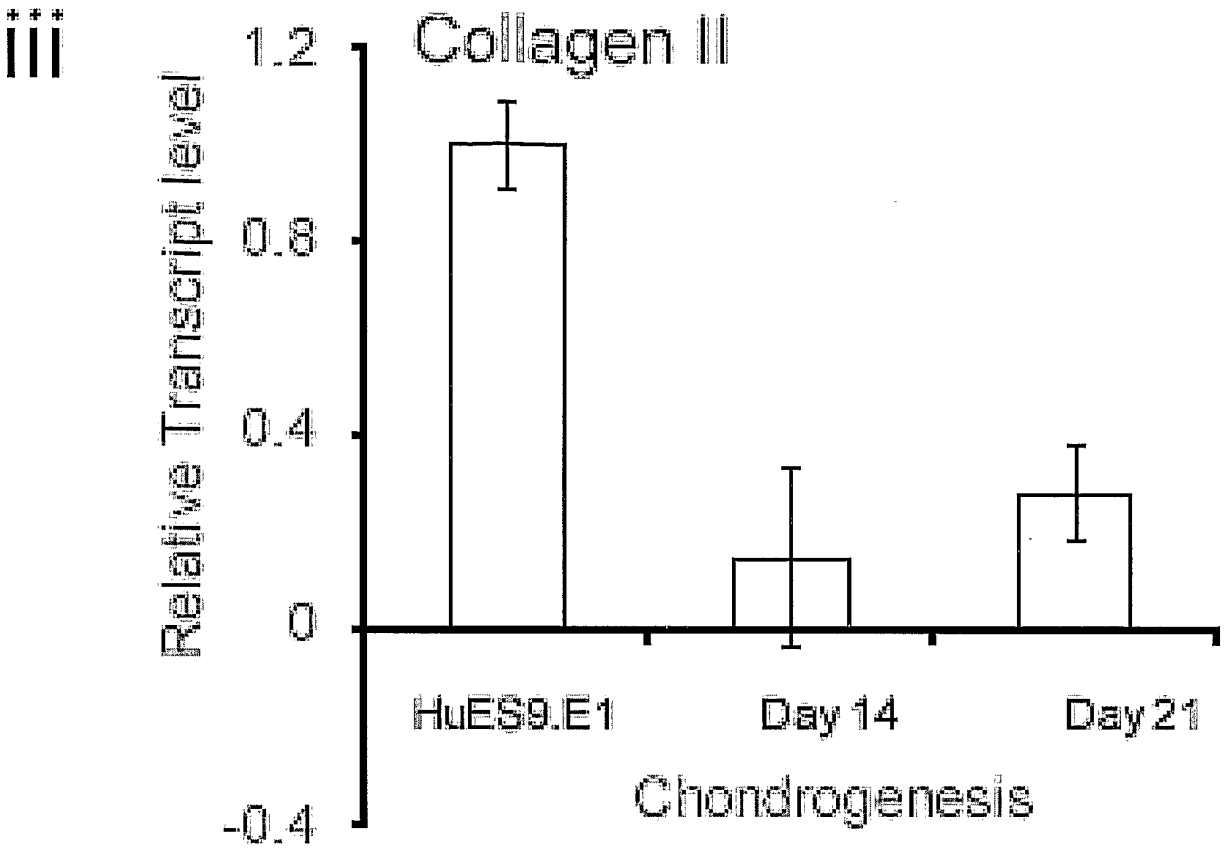


FIGURE 3C

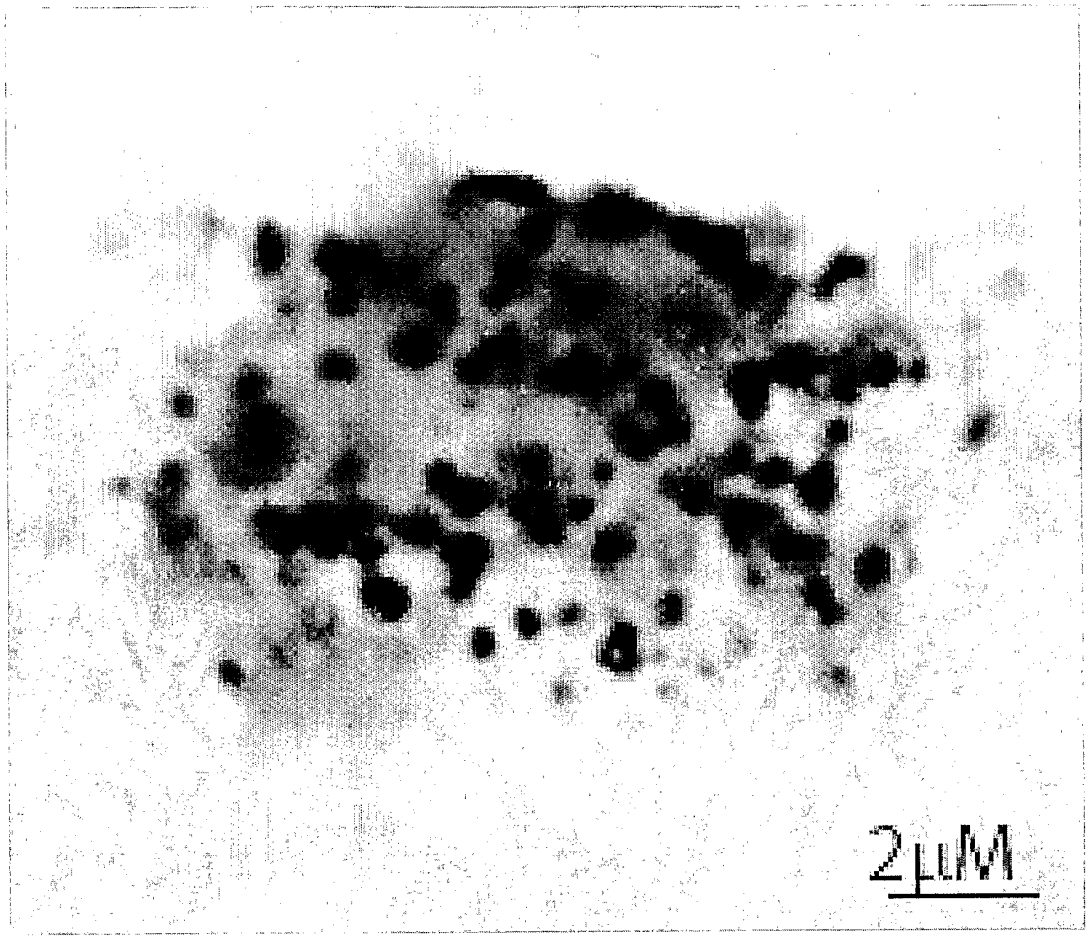


FIGURE 3C (CONTINUED)

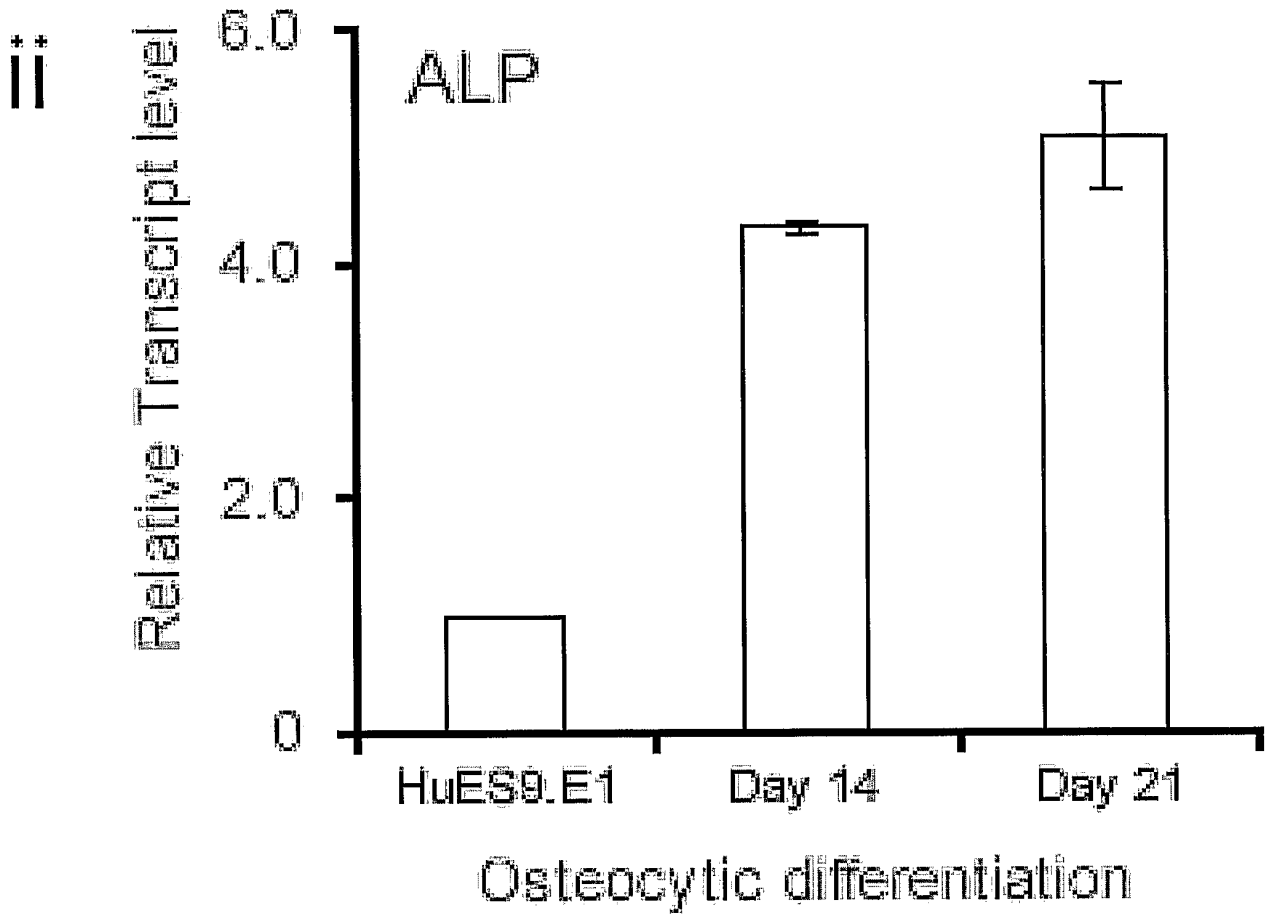


FIGURE 3C (CONTINUED)

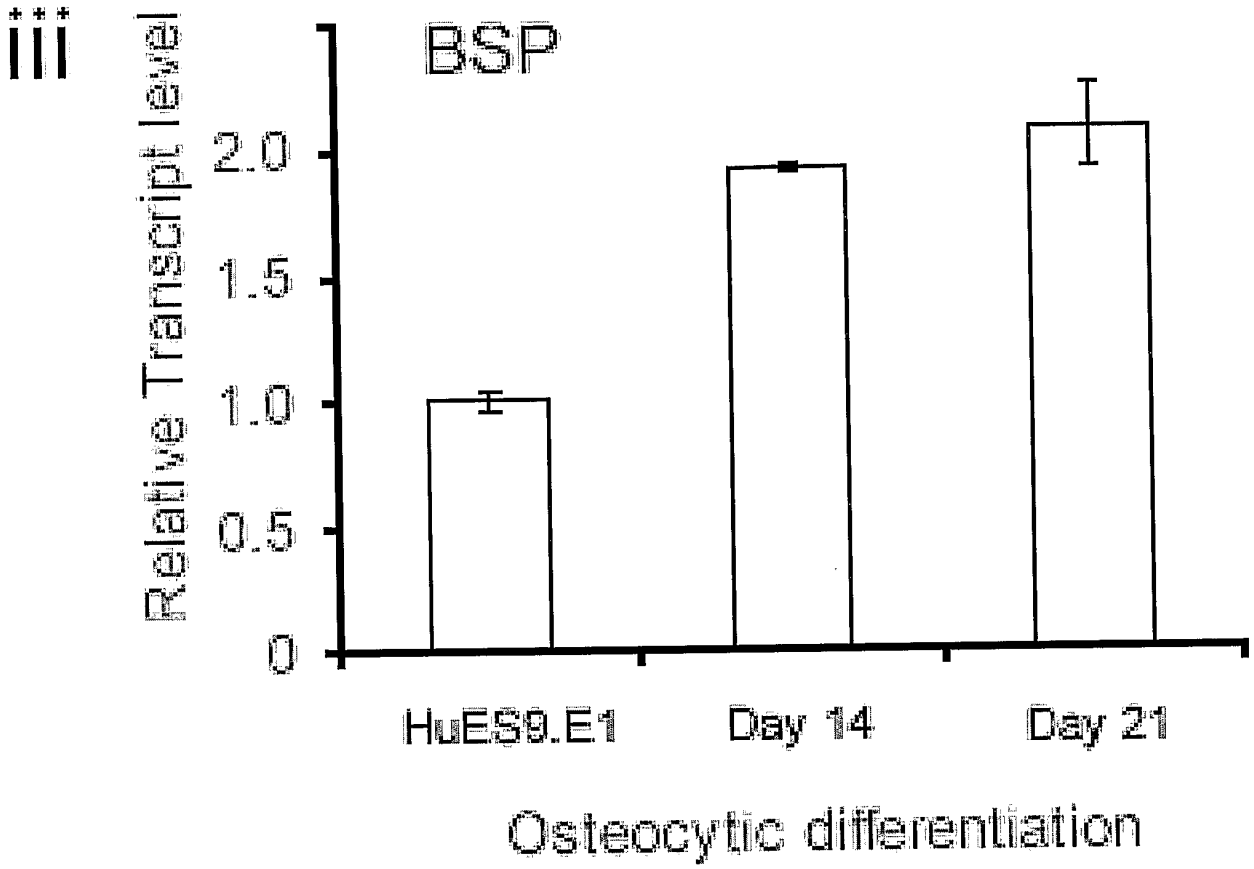


FIGURE 4A

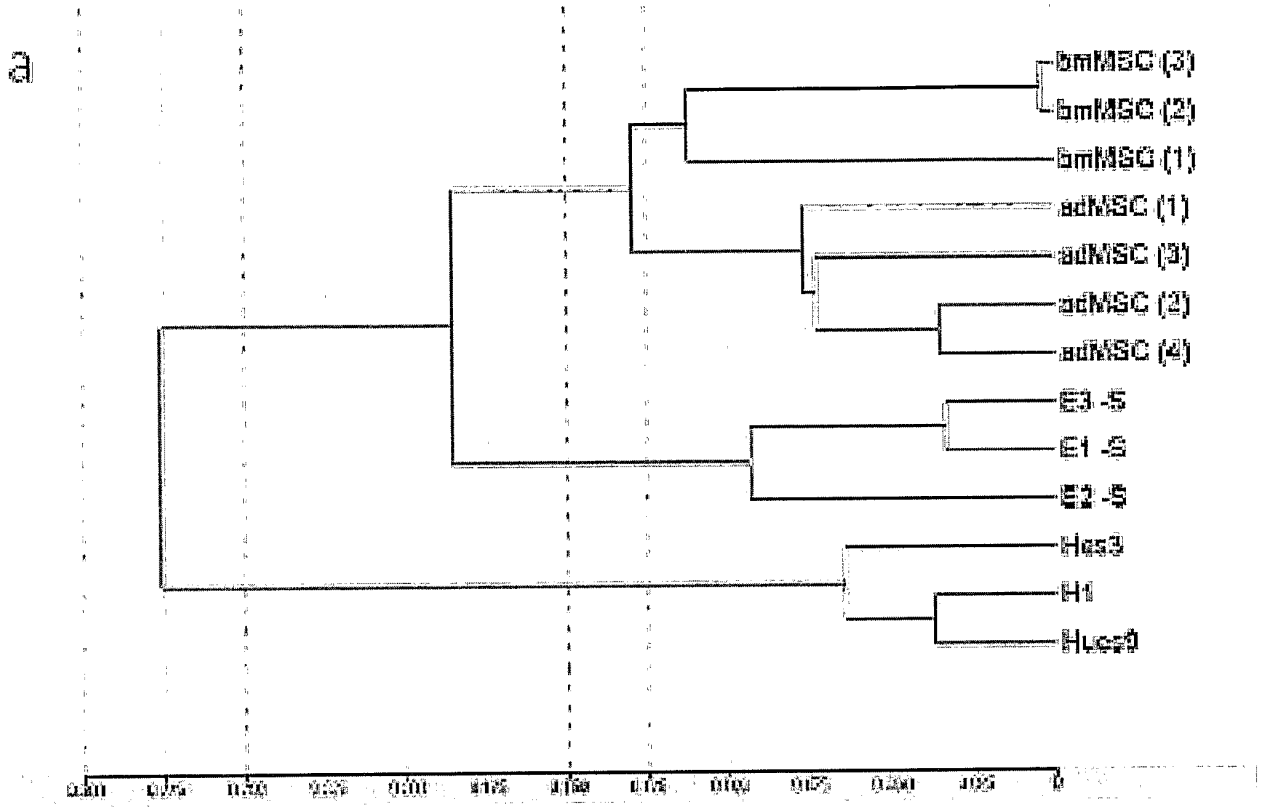

a)
bmMSC (3)
bmMSC (2)
bmMSC (1)
adMSC (1)
adMSC (3)
adMSC (2)
adMSC (4)
E3 -5
E1 -5
E2 -5
Hes3
H1

FIGURE 4B

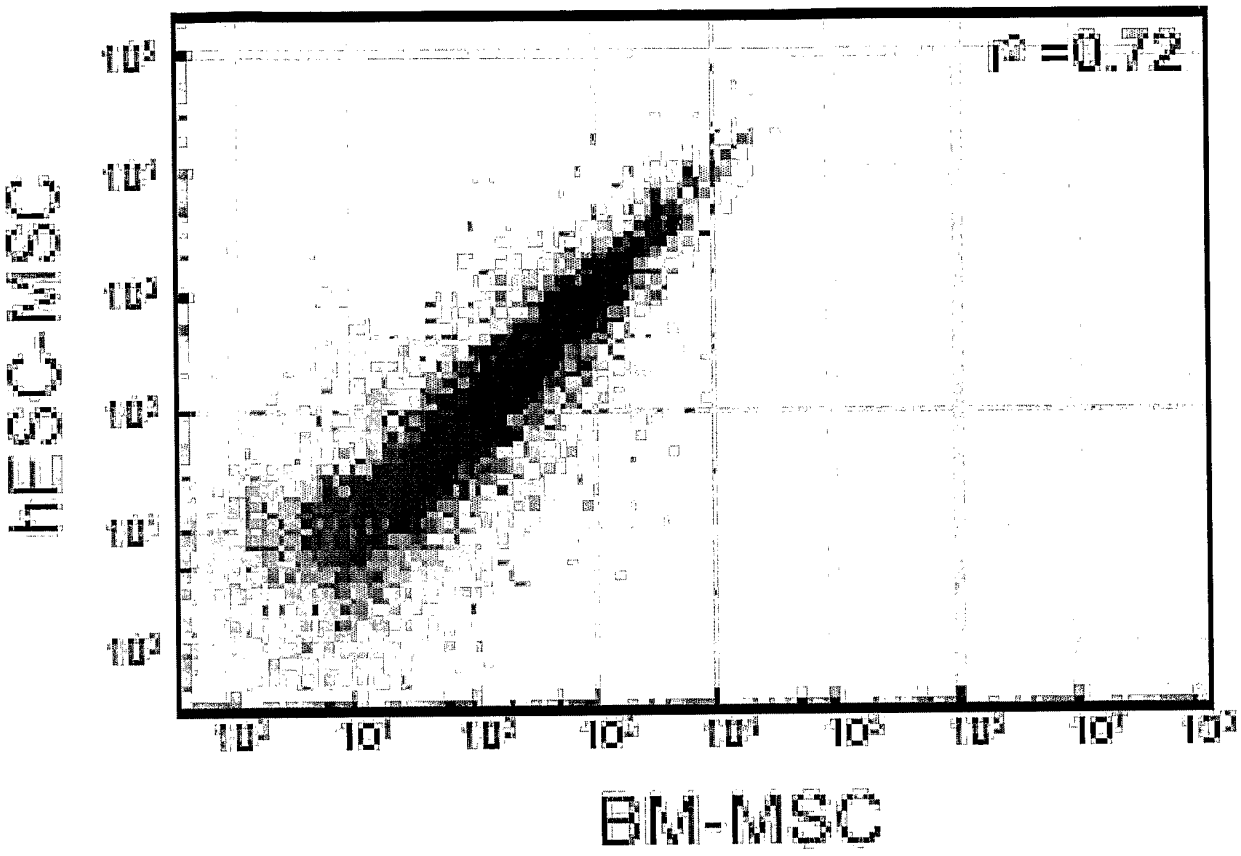


FIGURE 4B (CONTINUED)

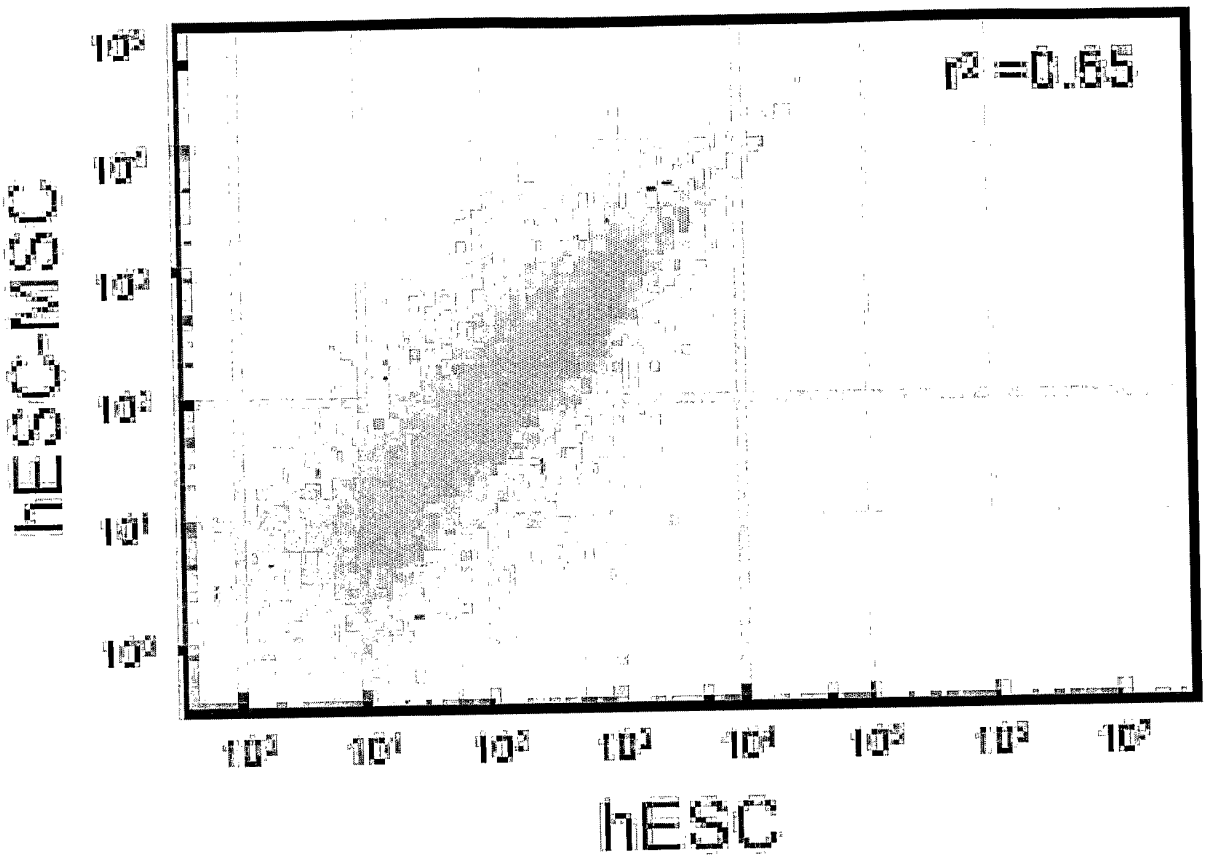


FIGURE 4C

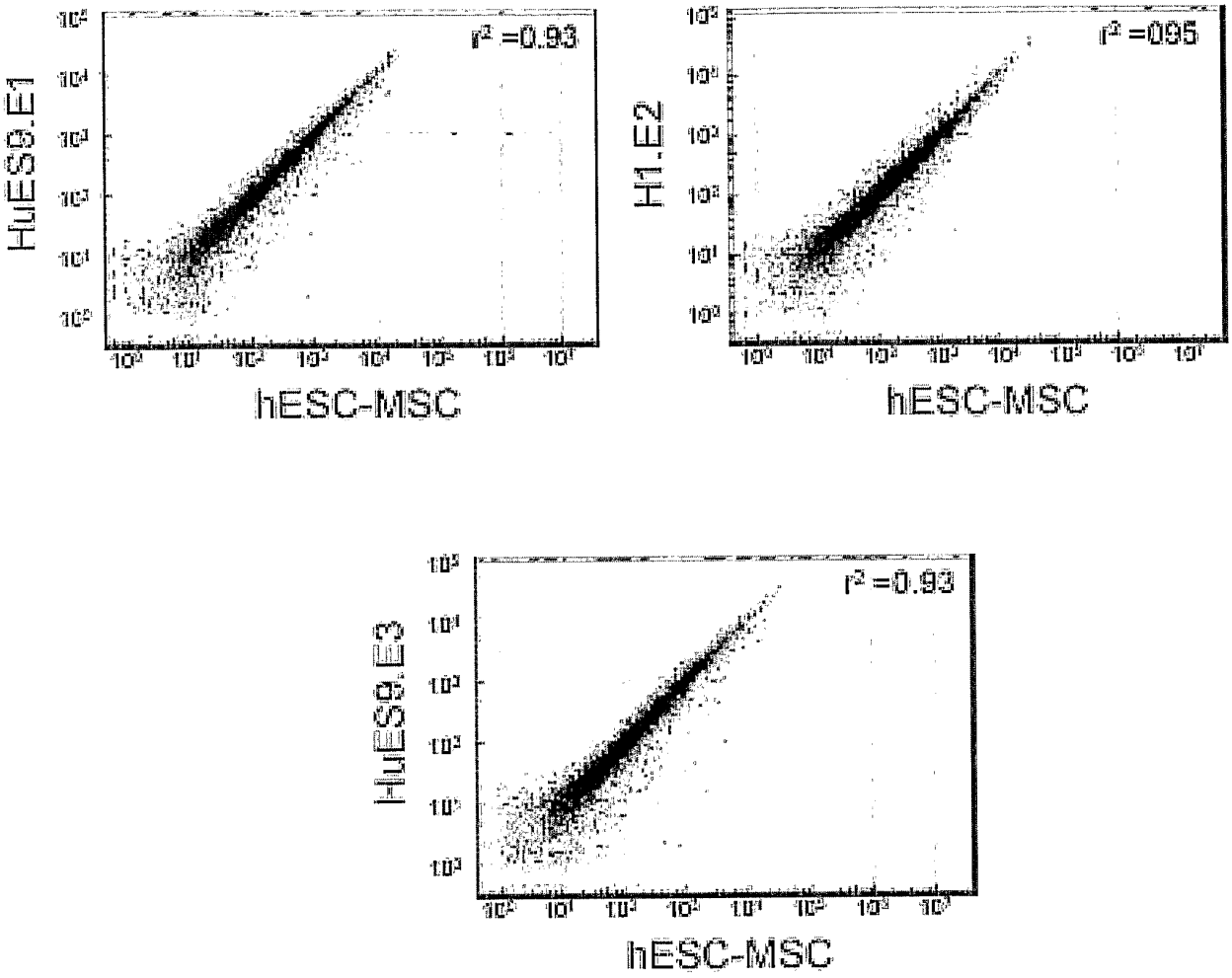

HuES9.E1
r² =0.93
hESC-MSC
H1.E2
r² =095
hESC-MSC
HuES9.E3
r² =0.93
hESC-MSC

FIGURE 4D

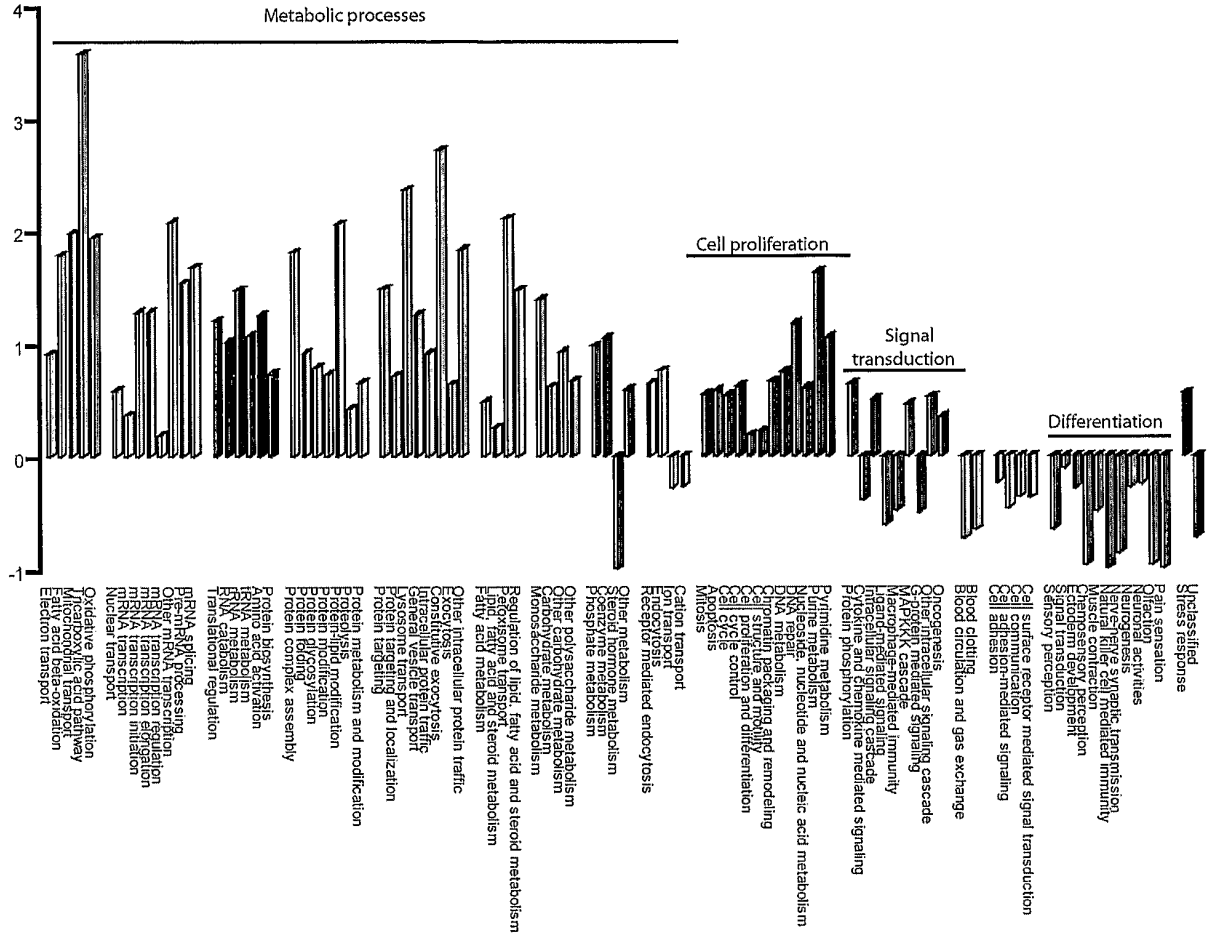

Metabolic processes
Cell proliferation
Signal transduction
Differentiation
4
3
2
1
0
-1
Electron transport
Fatty acid beta-oxidation
Microbody lipid pathway
Oxidative phosphorylation
Nuclear transport
mRNA transcription initiation
mRNA transcription elongation
mRNA transcription regulation
Other mRNA transcription
mRNA processing
piRNA processing
Translational regulation
tRNA catabolism
tRNA metabolism
Amino acid activation
Protein biosynthesis
Protein complex assembly
Protein folding
Protein glycosylation
Protein modification
Protein phosphorylation
Protein metabolism and modification
Protein targeting
Protein targeting and localization
Lysosome transport
General vesicle transport
Intracellular protein traffic
Exocytosis
Constitutive exocytosis
Other intracellular protein traffic
Fatty acid metabolism
Lipid, fatty acid and steroid metabolism
Peroxisome transport
Regulation of lipid, fatty acid and steroid metabolism
Monosaccharide metabolism
Carbohydrate metabolism
Other polysaccharide metabolism
Phosphate metabolism
Coenzyme metabolism
Other metabolism
Receptor mediated endocytosis
Endocytosis
Ion transport
Cation transport
Mitosis
Apoptosis
Cell cycle control
Cell proliferation and differentiation
Cell structure and motility
DNA metabolism
DNA repair
Nucleoside, nucleotide and nucleic acid metabolism
Purine metabolism
Pyrimidine metabolism
Protein phosphorylation
Cytokine and chemokine mediated signaling
Intracellular signaling cascade
Lipopolysaccharide mediated signaling
Innate immunity mediated immunity
MAPKKK cascade
G-protein mediated signaling
Other intracellular signaling cascade
Oncogenesis
Cell adhesion mediated signaling
Cell communication
Cell surface receptor mediated signal transduction
Blood circulation and gas exchange
Blood clotting
Sensory perception
Sensory transduction
Ectoderm development
Chemosensory perception
Muscle contraction
Neural tube synaptic transmission
Neurogenesis
Neuronal activities
Olfaction
Pain sensation
Unclassified
Stress response

FIGURE 4E

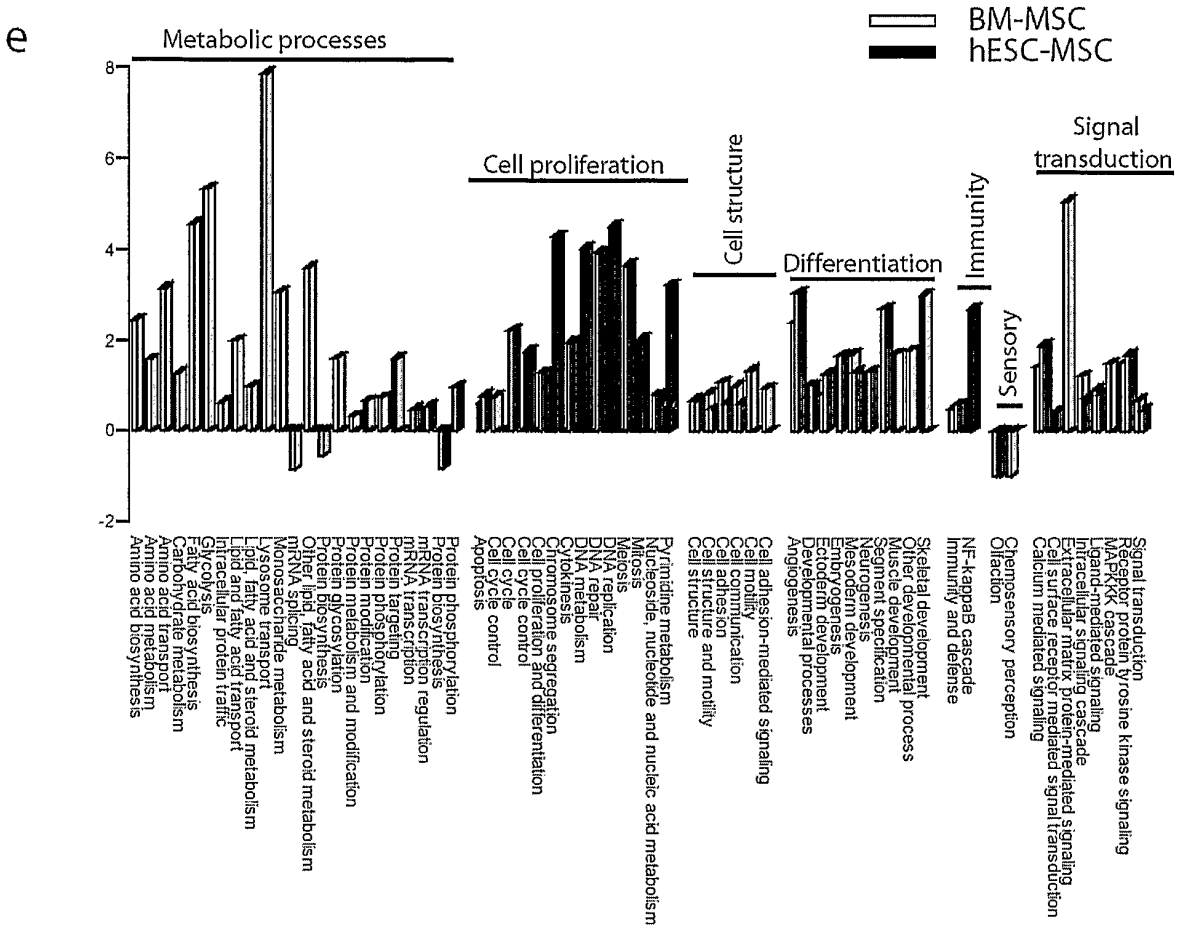

e
BM-MSC
hESC-MSC
Metabolic processes
Cell proliferation
Cell structure
Differentiation
Immunity
Sensory
Signal transduction
8
6
4
2
0
-2
Amino acid biosynthesis
Amino acid metabolism
Amino acid transport
Carbohydrate metabolism
Fatty acid biosynthesis
Glycolysis
Intracellular protein traffic
Lipid and fatty acid transport
Lipid, fatty acid and steroid metabolism
Lysosome transport
Monosaccharide metabolism
mRNA splicing
Other lipid, fatty acid and steroid metabolism
Protein biosynthesis
Protein glycosylation
Protein metabolism and modification
Protein modification
Protein phosphorylation
Protein targeting
mRNA transcription
mRNA transcription regulation
Protein biosynthesis
Protein phosphorylation
Apoptosis
Cell cycle
Cell cycle control
Cell proliferation and differentiation
Chromosome segregation
Cytokinesis
DNA metabolism
DNA repair
DNA replication
Meiosis
Mitosis
Nucleoside, nucleotide and nucleic acid metabolism
Pyrimidine metabolism
Cell structure
Cell structure and motility
Cell communication
Cell motility
Cell adhesion-mediated signaling
Angiogenesis
Developmental processes
Ectoderm development
Embryogenesis
Mesoderm development
Neurogenesis
Segment specification
Muscle development
Other developmental process
Skeletal development
Immunity and defense
NF-kappaB cascade
Olfaction
Chemosensory perception
Calcium mediated signaling
Cell surface receptor mediated signal transduction
Extracellular matrix protein-mediated signaling
Intracellular signaling cascade
Ligand-mediated signaling
MAPKKK cascade
Receptor protein tyrosine kinase signaling
Signal transduction

FIGURE 5A

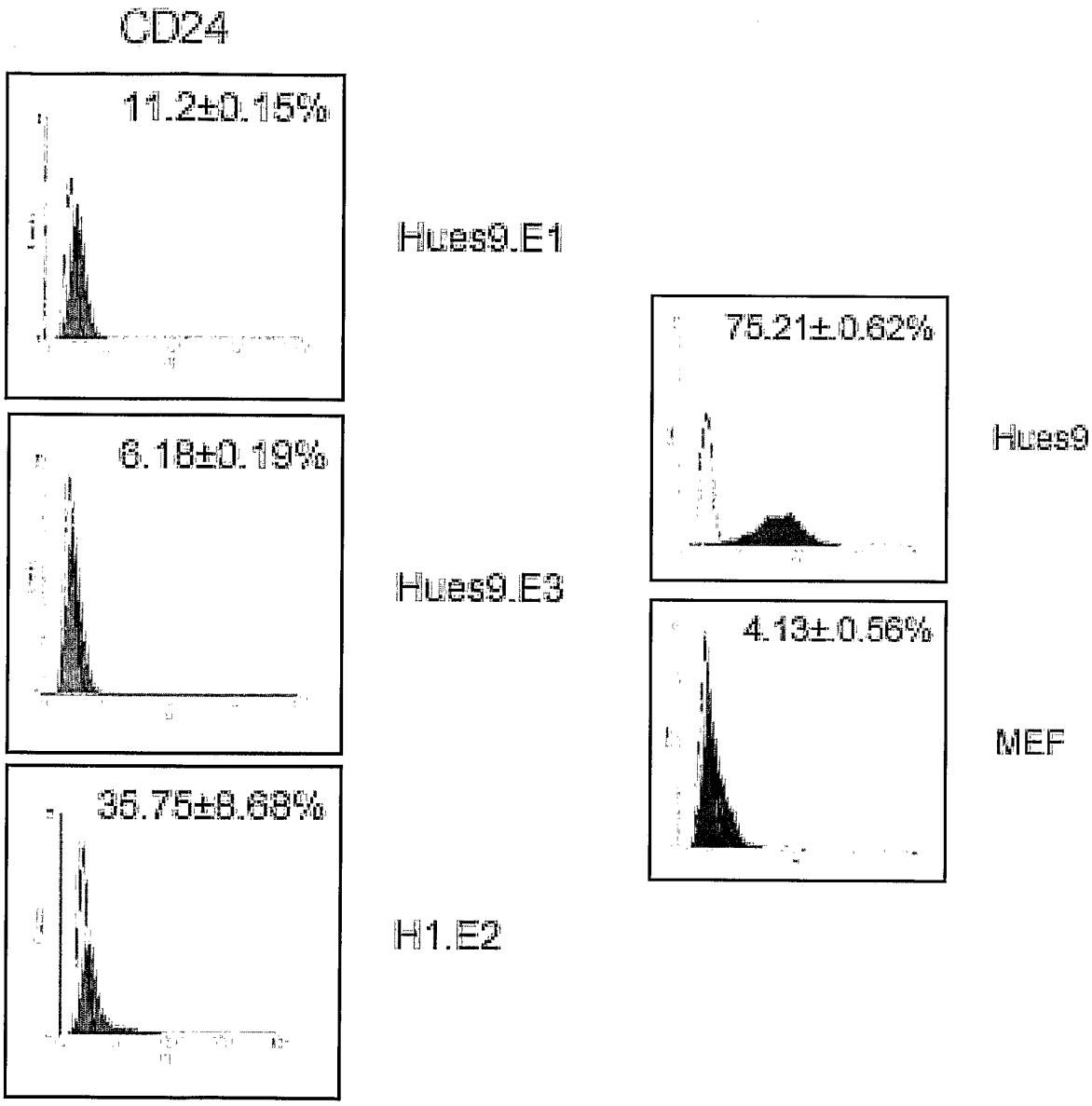

CD24
11.2±0.15%
Hues9.E1
6.18±0.19%
Hues9.E3
35.75±8.68%
H1.E2
75.21±0.62%
Hues9
4.13±0.56%
MEF

FIGURE 5B

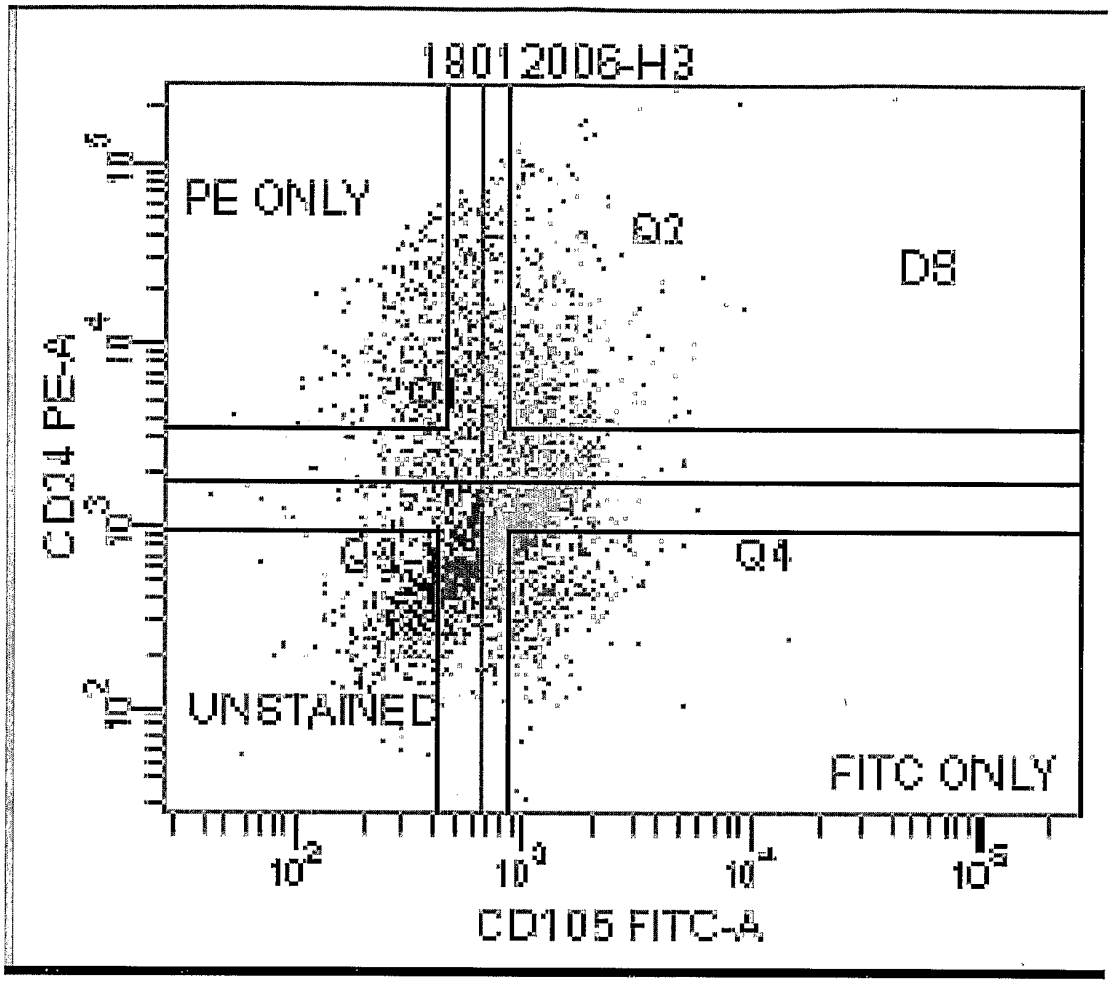

18012006-H3
PE ONLY
Q2
D8
Q3
Q4
UNSTAINED
FITC ONLY
CD34 PE-A
CD105 FITC-A
10^2
10^3
10^4
10^5

FIGURE 5B (CONTINUED)

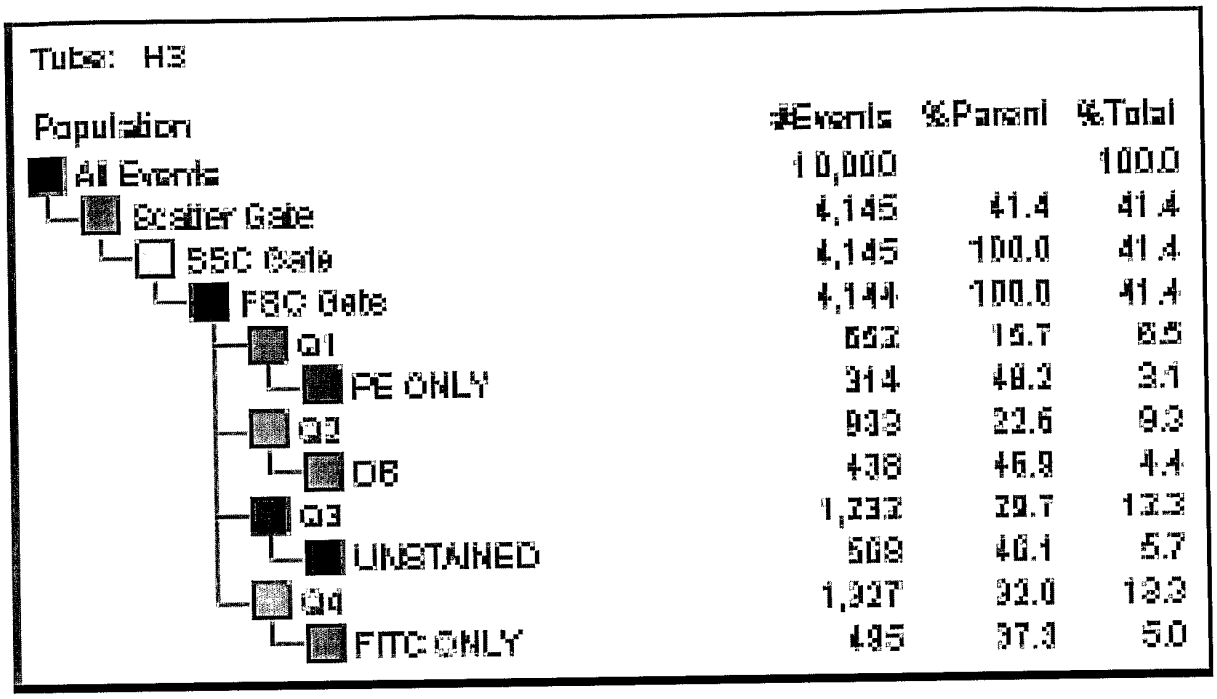


FIGURE 5C

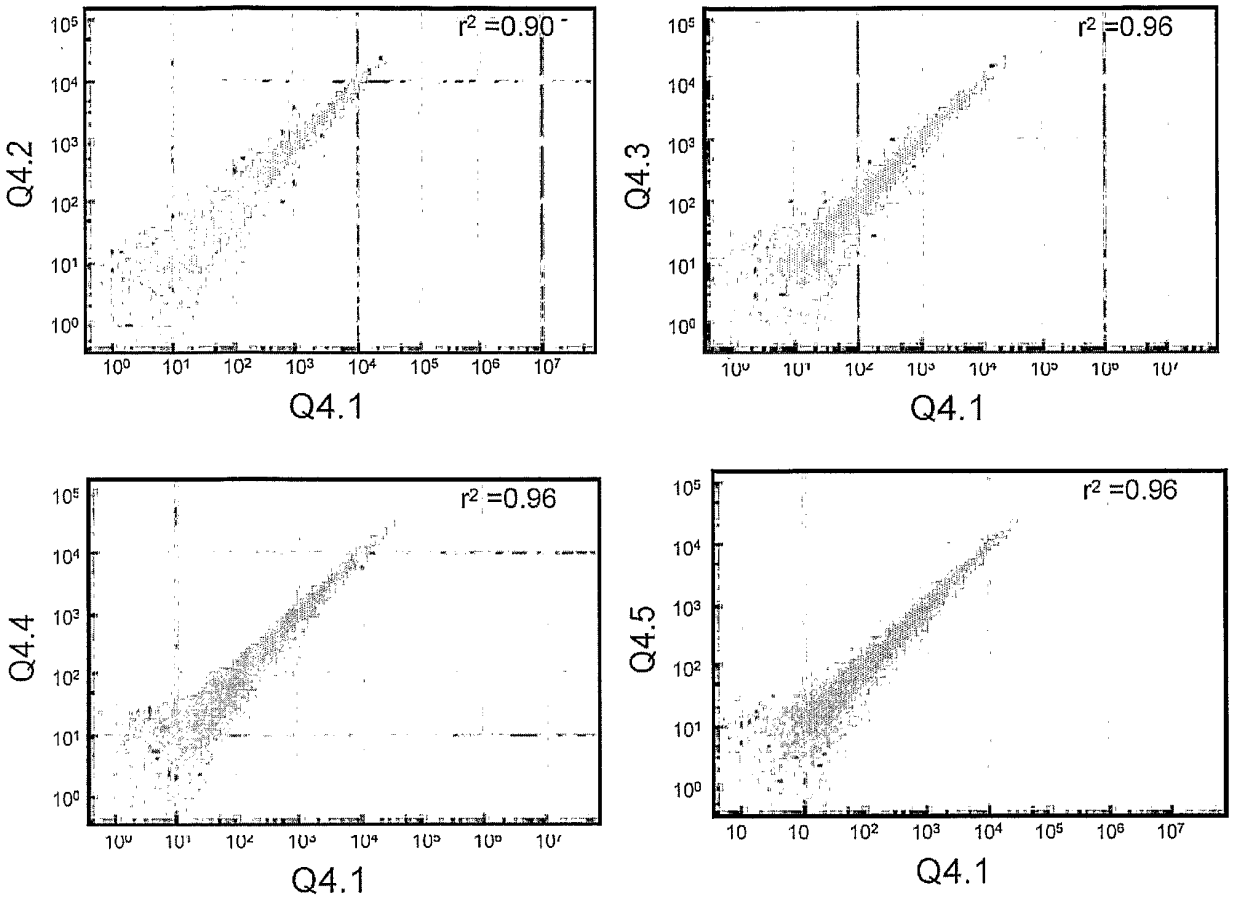


FIGURE 5D

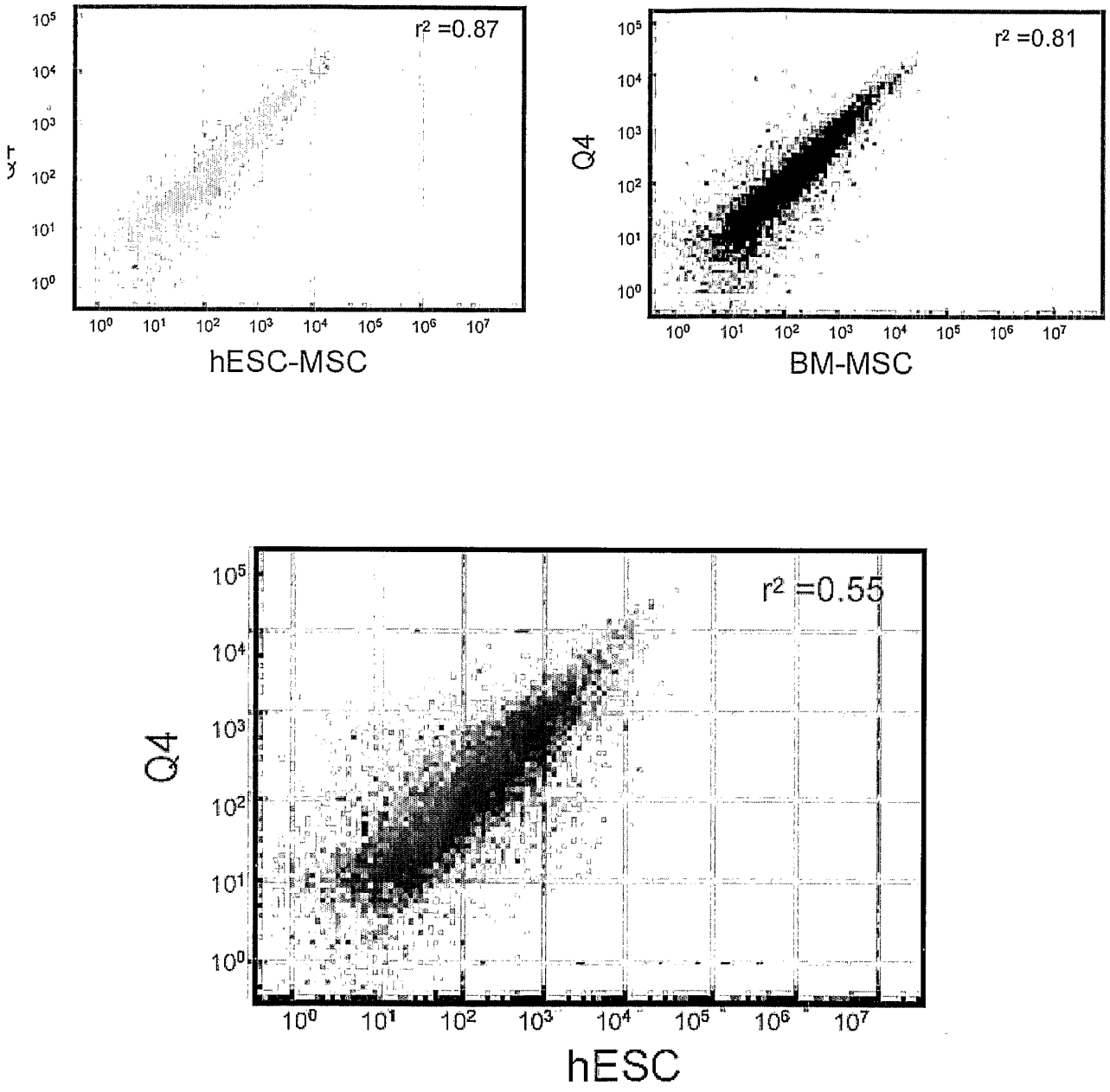


FIGURE 5E

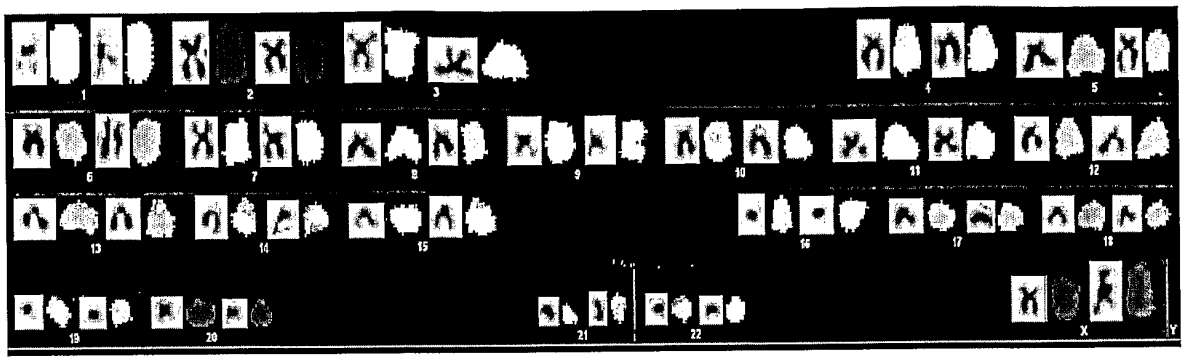


FIGURE 6

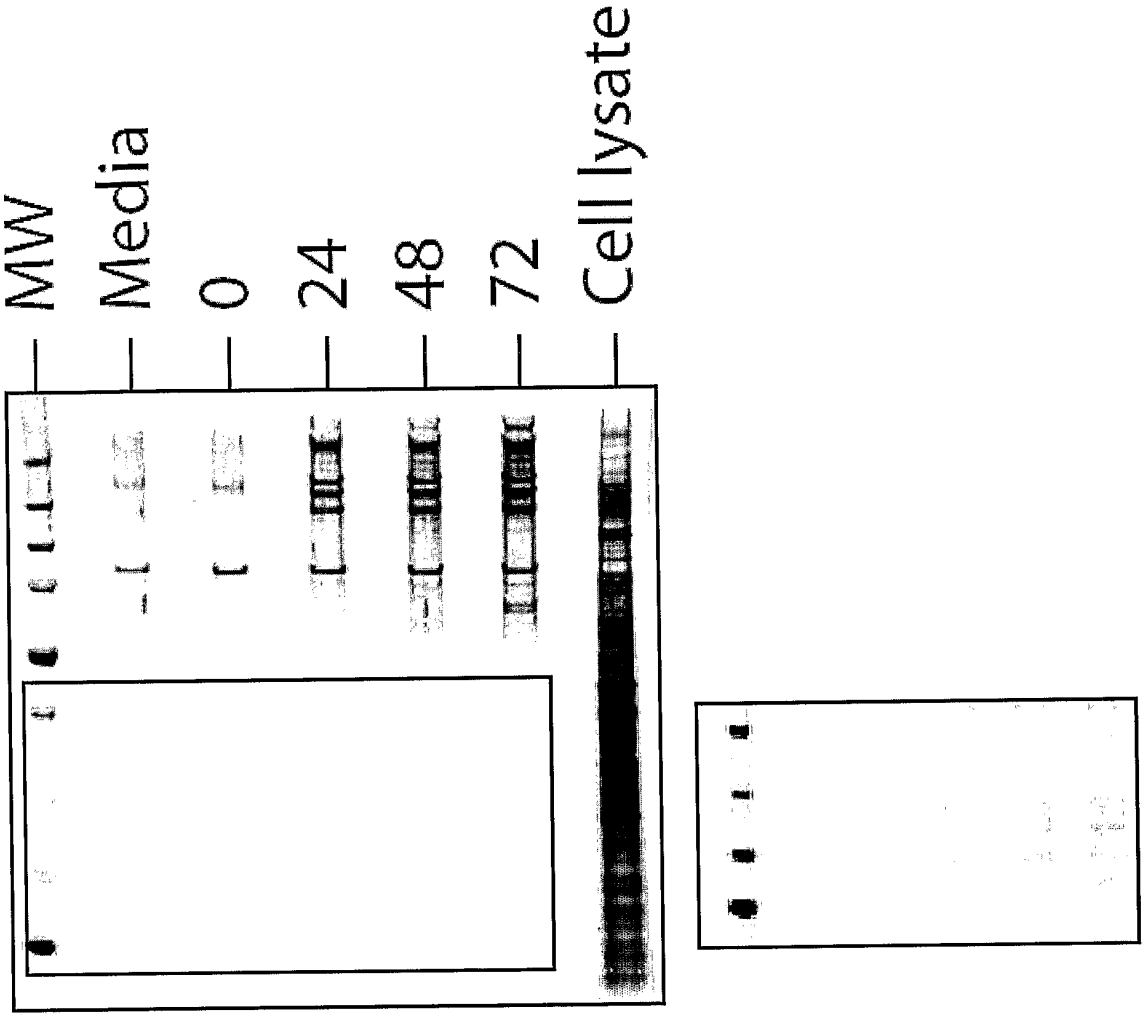


FIGURE 7

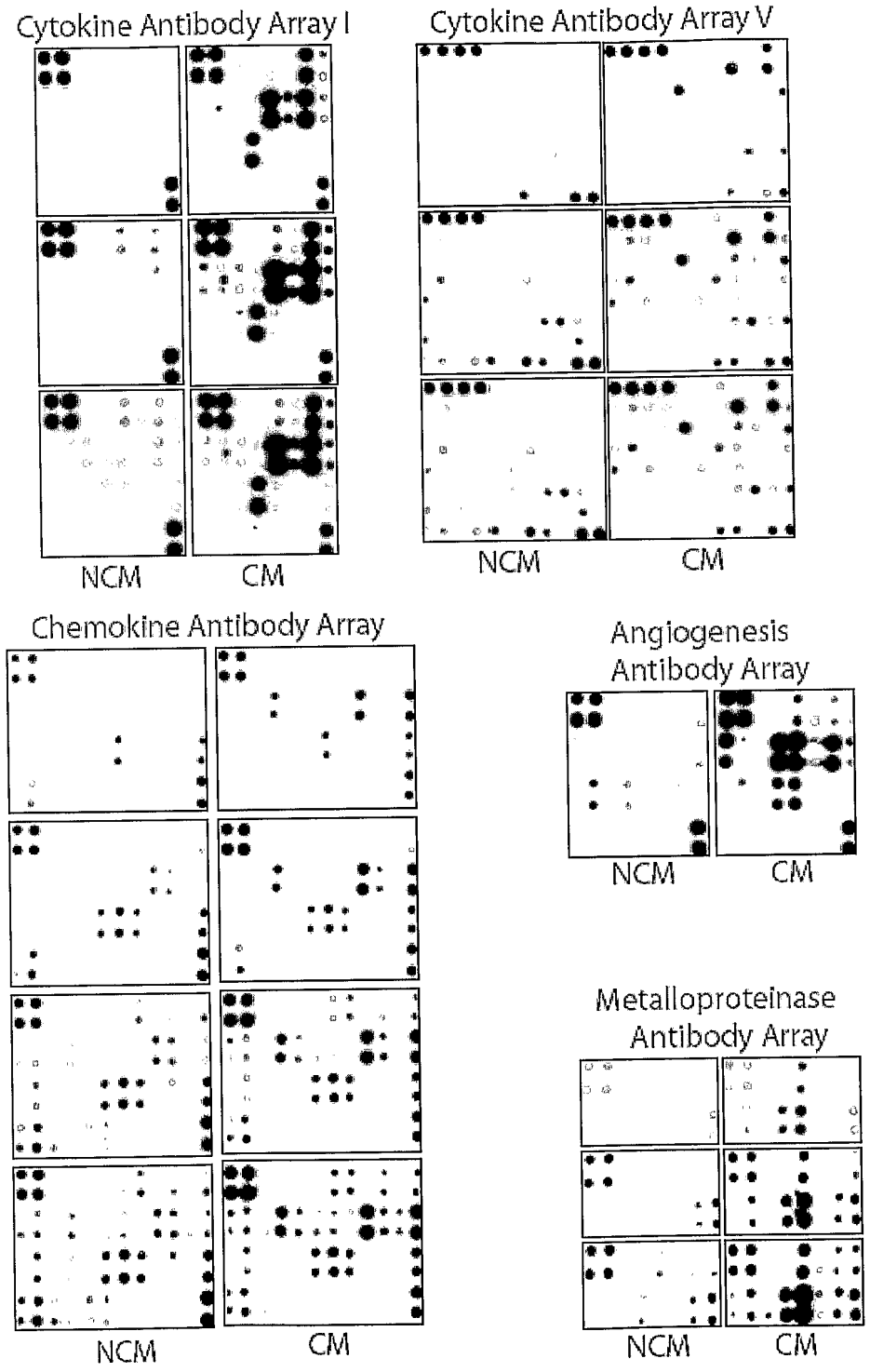

Cytokine Antibody Array I
NCM
CM
Cytokine Antibody Array V
NCM
CM
Chemokine Antibody Array
NCM
CM
Angiogenesis
Antibody Array
NCM
CM
Metalloproteinase
Antibody Array
NCM
CM

FIGURE 8

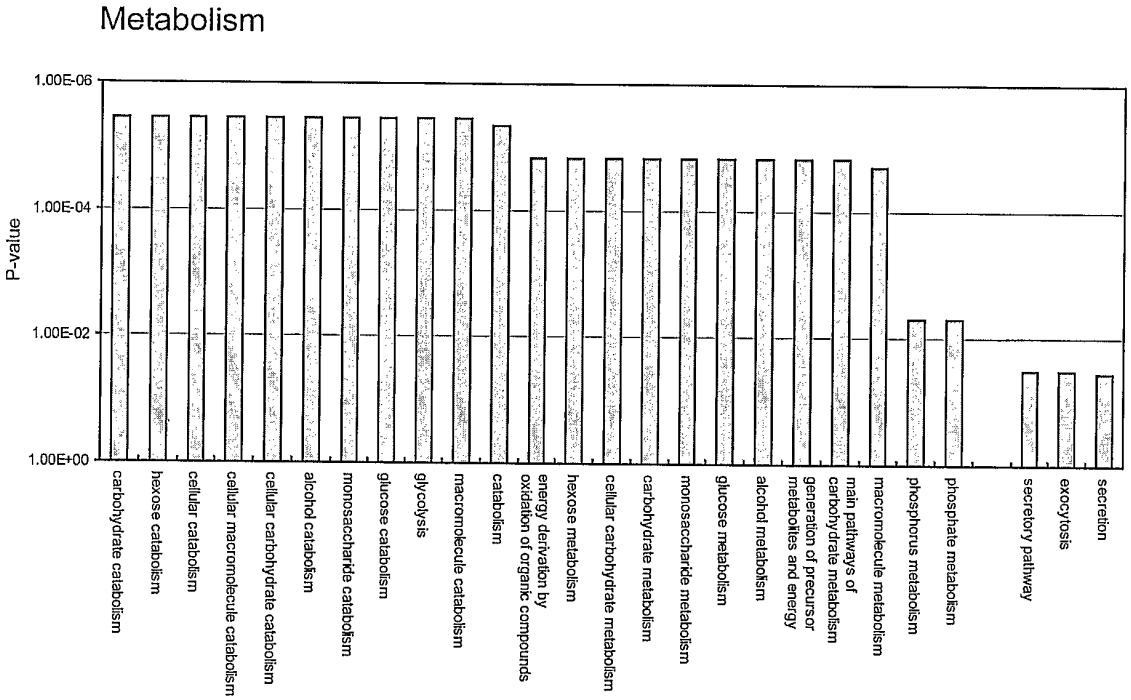

Metabolism
P-value
1.00E-06
1.00E-04
1.00E-02
1.00E+00
carbohydrate catabolism
hexose catabolism
cellular catabolism
cellular macromolecule catabolism
cellular carbohydrate catabolism
alcohol catabolism
monosaccharide catabolism
glucose catabolism
glycolysis
macromolecule catabolism
catabolism
energy derivation by oxidation of organic compounds
hexose metabolism
cellular carbohydrate metabolism
carbohydrate metabolism
monosaccharide metabolism
glucose metabolism
alcohol metabolism
generation of precursor metabolites and energy
main pathways of carbohydrate metabolism
macromolecule metabolism
phosphorus metabolism
phosphate metabolism
secretory pathway
exocytosis
secretion

FIGURE 8 (CONTINUED)

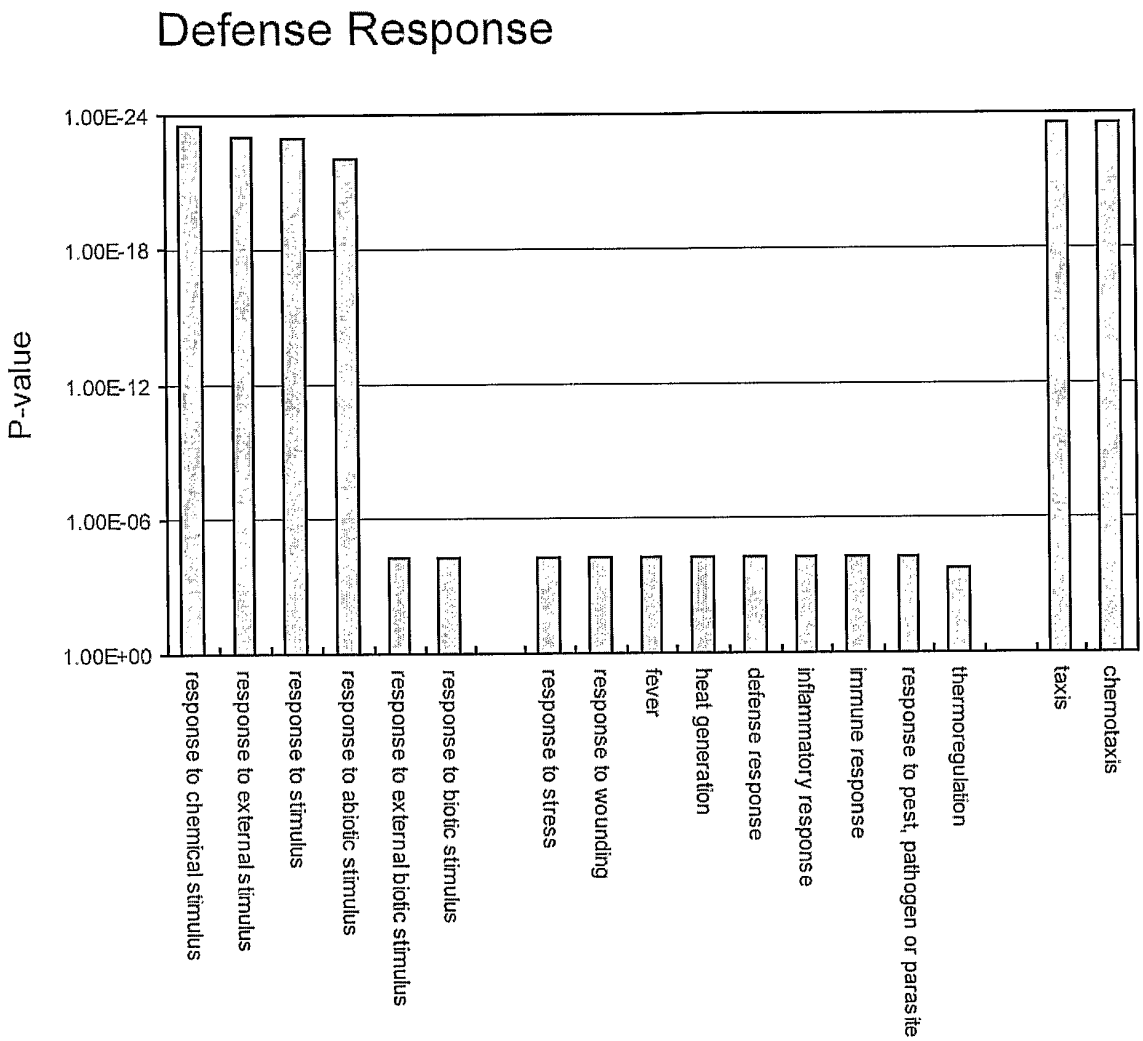


FIGURE 8 (CONTINUED)

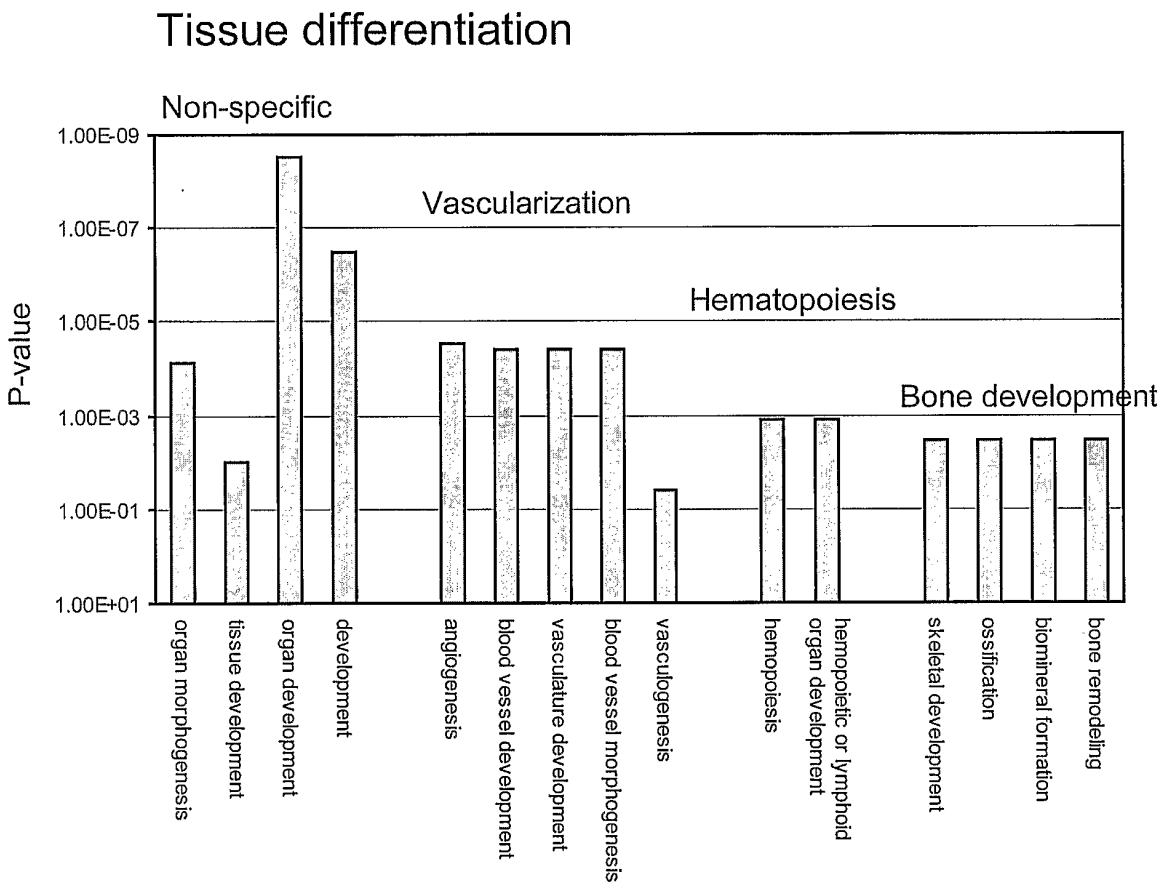


FIGURE 9

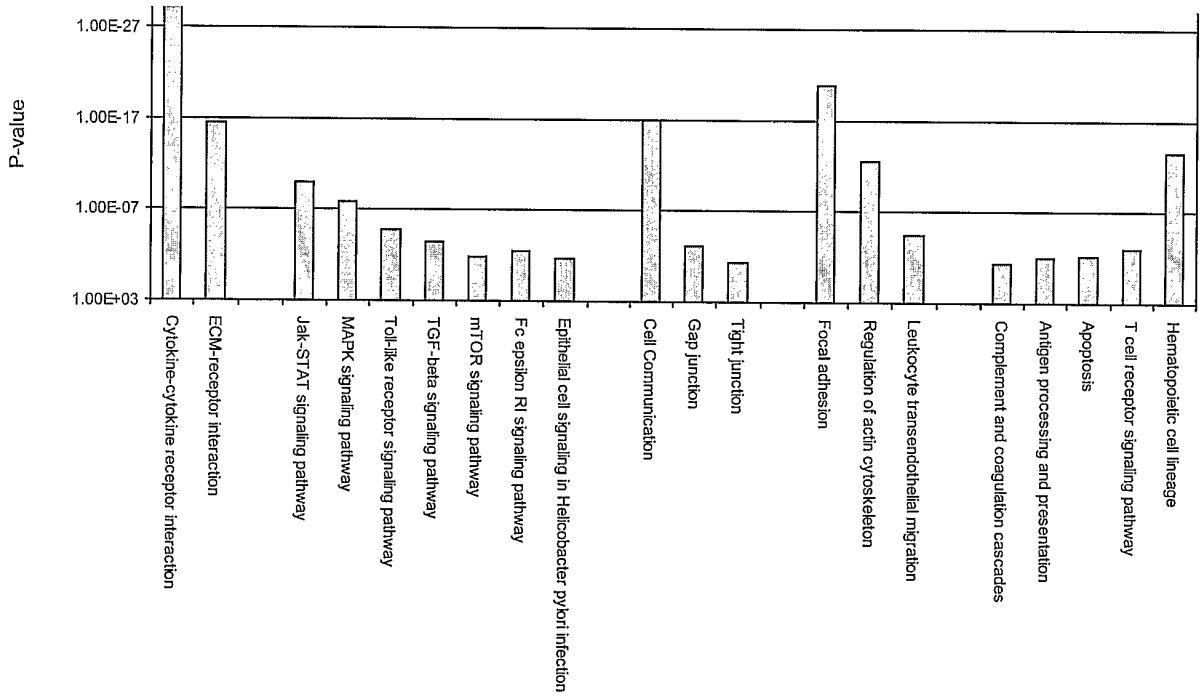

P-value
1.00E-27
1.00E-17
1.00E-07
1.00E+03
Cytokine-cytokine receptor interaction
ECM-receptor interaction
Jak-STAT signaling pathway
MAPK signaling pathway
Toll-like receptor signaling pathway
TGF-beta signaling pathway
mTOR signaling pathway
Fc epsilon RI signaling pathway
Epithelial cell signaling in Helicobacter pylori infection
Cell Communication
Gap junction
Tight junction
Focal adhesion
Regulation of actin cytoskeleton
Leukocyte transendothelial migration
Complement and coagulation cascades
Antigen processing and presentation
Apoptosis
T cell receptor signaling pathway
Hematopoietic cell lineage

FIGURE 9 (CONTINUED)

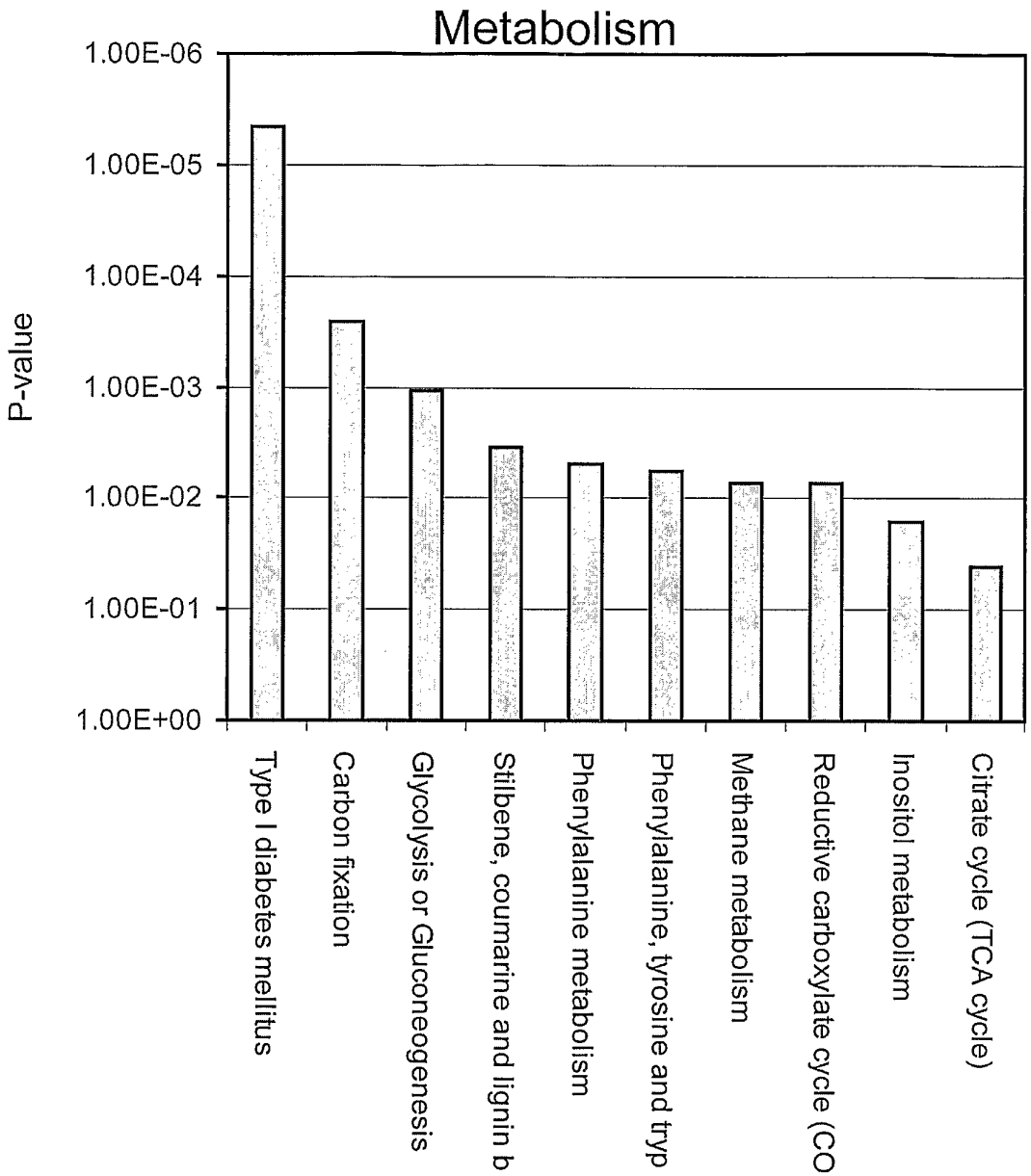


FIGURE 10

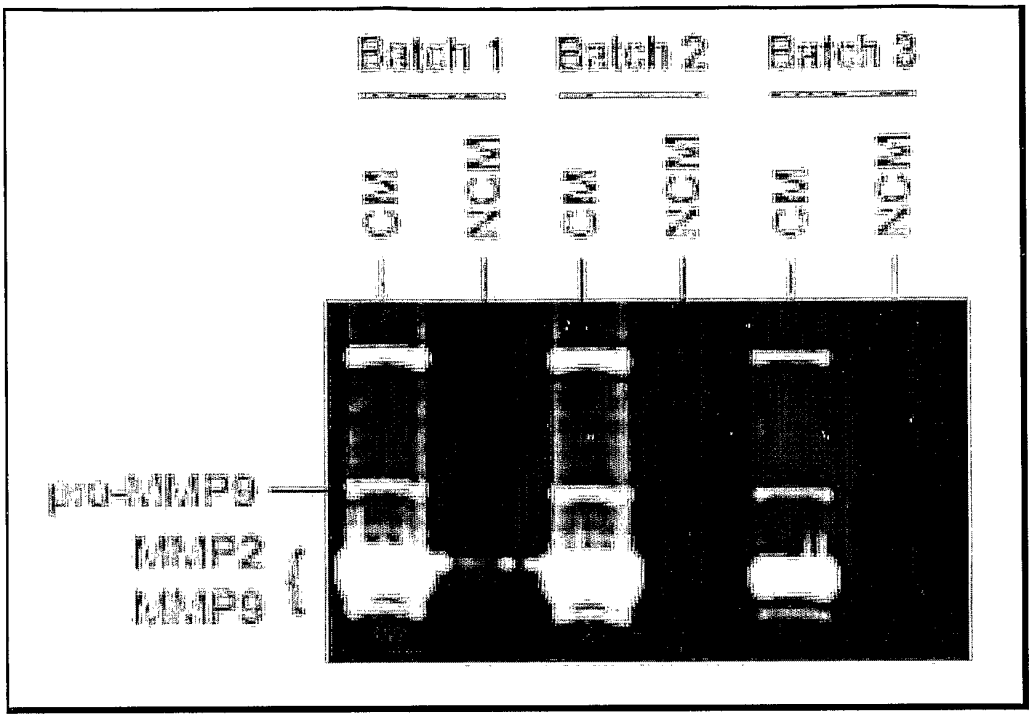


FIGURE 11A

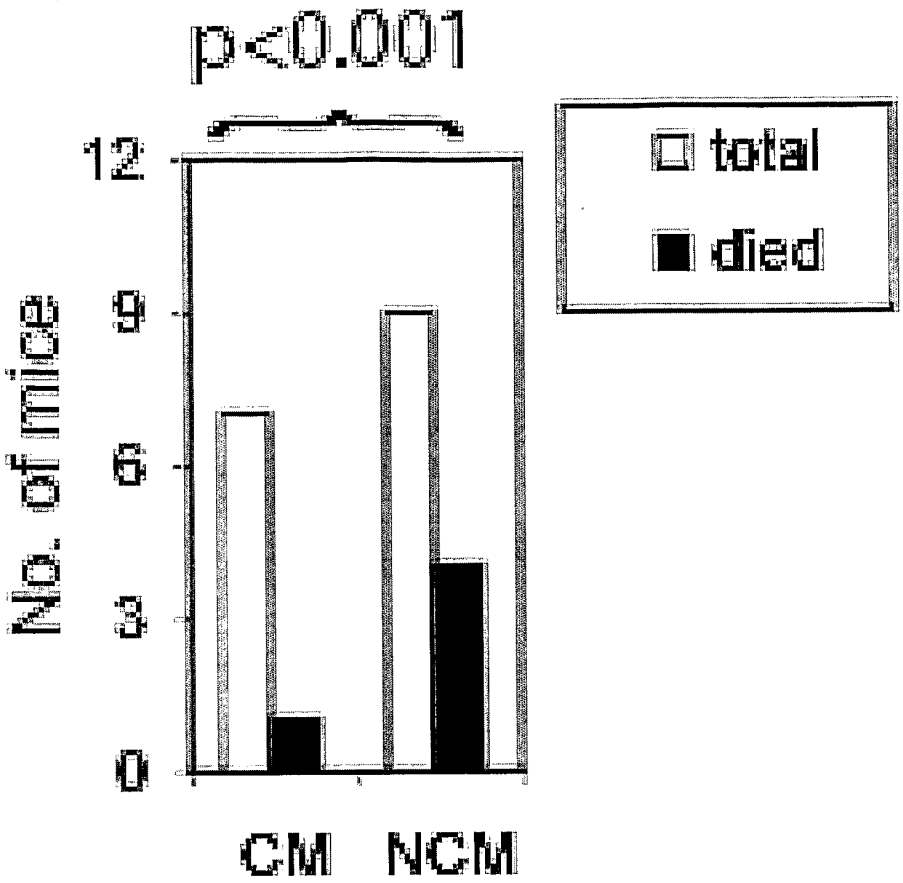


FIGURE 11B

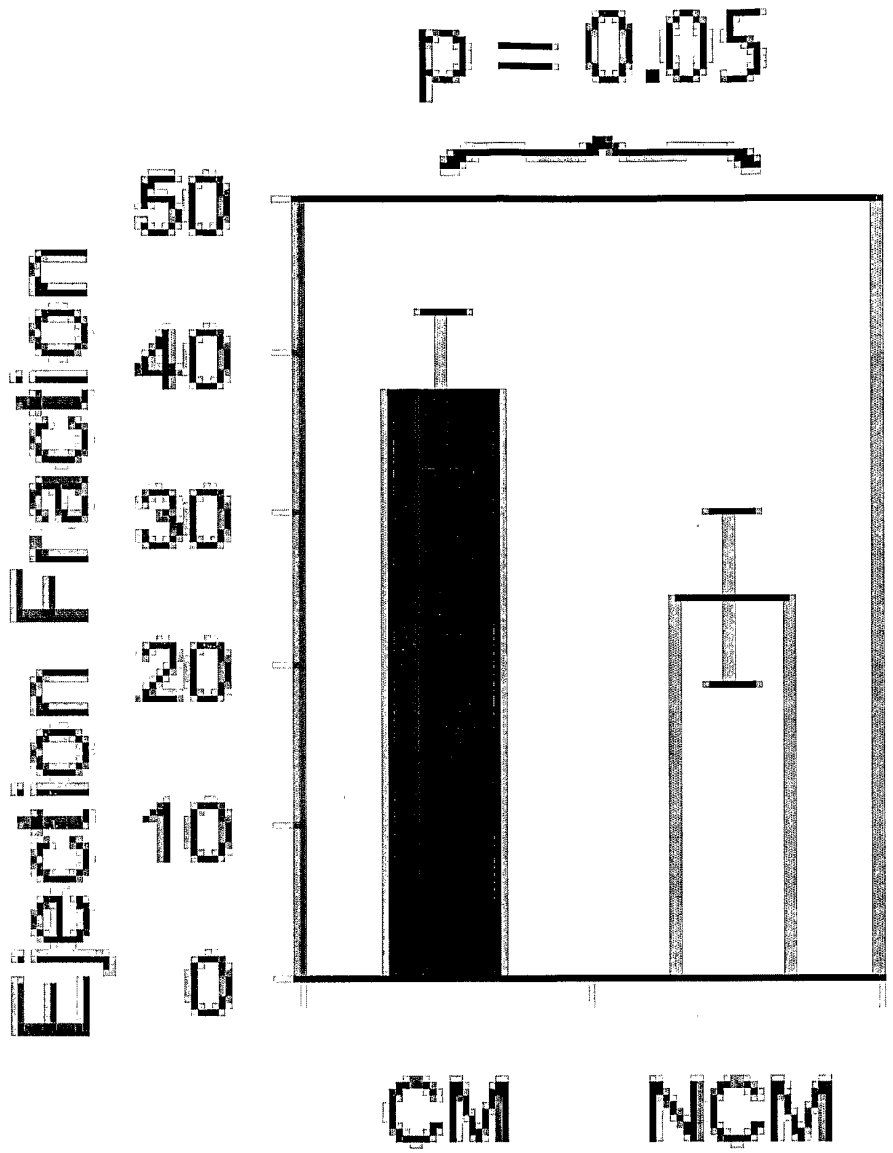


FIGURE 12

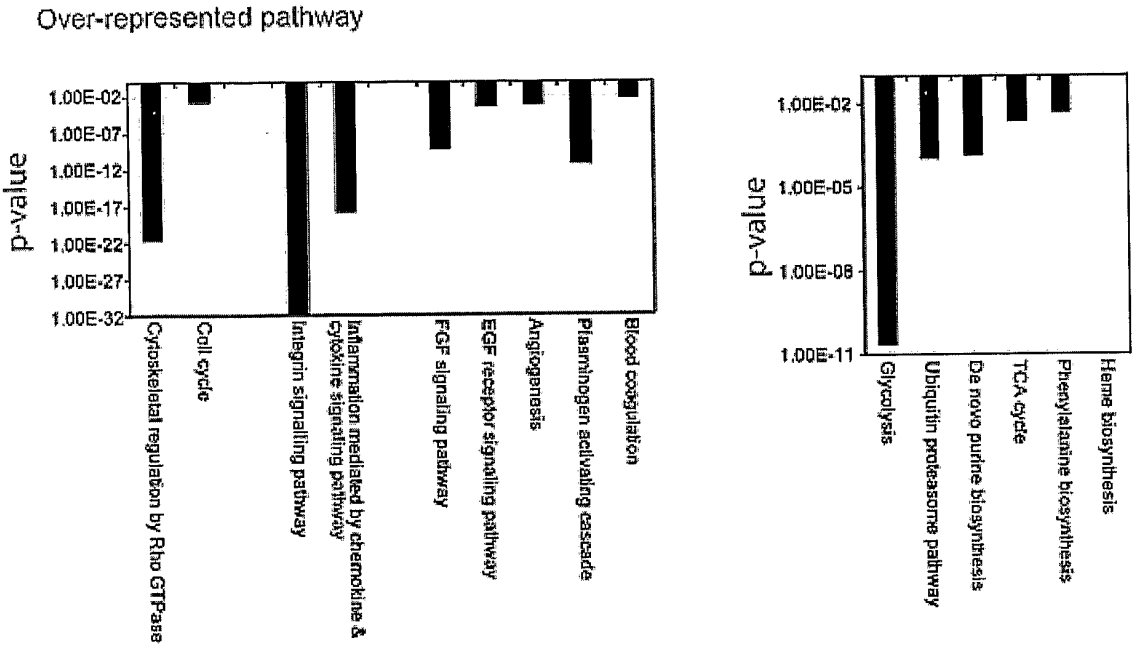

Over-represented pathway
p-value
1.00E-02
1.00E-07
1.00E-12
1.00E-17
1.00E-22
1.00E-27
1.00E-32
Cytoskeletal regulation by Rho GTPase
Cell cycle
Integrin signalling pathway
Inflammation mediated by chemokine & cytokine signaling pathway
FGF signaling pathway
EGF receptor signaling pathway
Angiogenesis
Plasminogen activating cascade
Blood coagulation
p-value
1.00E-02
1.00E-05
1.00E-08
1.00E-11
Glycolysis
Ubiquitin proteasome pathway
De novo purine biosynthesis
TCA cycle
Phenylalanine biosynthesis
Heme biosynthesis

FIGURE 13

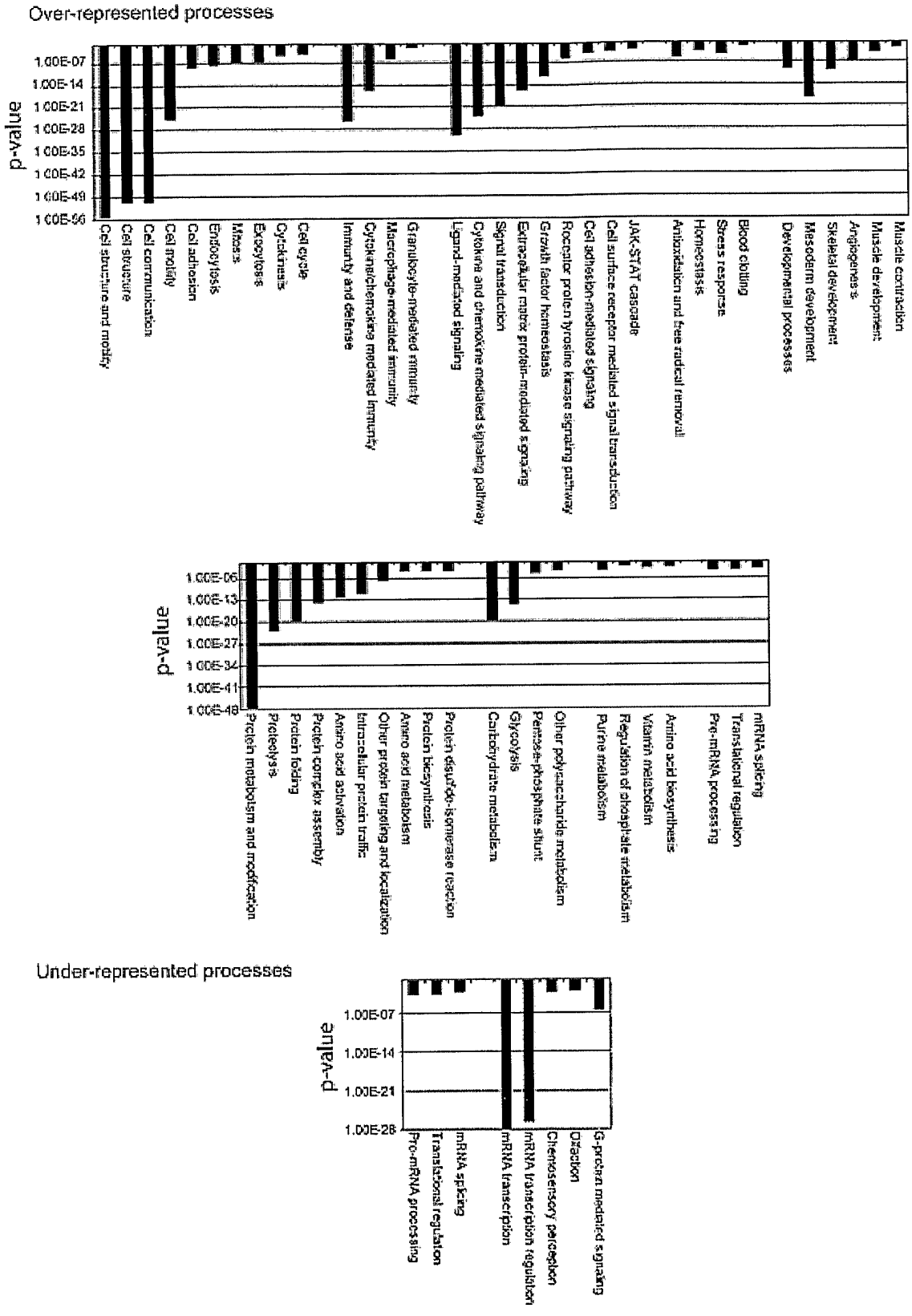

Over-represented processes
p-value
1.00E-07
1.00E-14
1.00E-21
1.00E-28
1.00E-35
1.00E-42
1.00E-49
1.00E-56
Cell structure and motility
Cell structure
Cell communication
Cell motility
Cell adhesion
Endocytosis
Mitosis
Exocytosis
Cytokinesis
Cell cycle
Immunity and defense
Cytokine/chemokine mediated immunity
Macrophage-mediated immunity
Granulocyte-mediated immunity
Ligand-mediated signaling
Cytokine and chemokine mediated signaling pathway
Signal transduction
Extracellular matrix protein-mediated signaling
Growth factor homeostasis
Receptor protein tyrosine kinase signaling pathway
Cell adhesion-mediated signaling
Cell surface receptor mediated signal transduction
JAK-STAT cascade
Antioxidation and free radical removal
Homeostasis
Stress response
Blood clotting
Developmental processes
Mesoderm development
Skeletal development
Angiogenesis
Muscle development
Muscle contraction
p-value
1.00E-06
1.00E-13
1.00E-20
1.00E-27
1.00E-34
1.00E-41
1.00E-48
Protein metabolism and modification
Proteolysis
Protein folding
Protein complex assembly
Amino acid activation
Intracellular protein traffic
Other protein targeting and localization
Amino acid metabolism
Protein biosynthesis
Protein disulfide-isomerase reaction
Carbohydrate metabolism
Glycolysis
Pentose-phosphate shunt
Other polysaccharide metabolism
Purine metabolism
Regulation of phosphate metabolism
Vitamin metabolism
Amino acid biosynthesis
Pre-mRNA processing
Translational regulation
mRNA splicing
Under-represented processes
p-value
1.00E-07
1.00E-14
1.00E-21
1.00E-28
Pre-mRNA processing
Translational regulation
mRNA splicing
mRNA transcription
mRNA transcription regulation
Chemosensory perception
Olfaction
G-protein mediated signaling

FIGURE 14

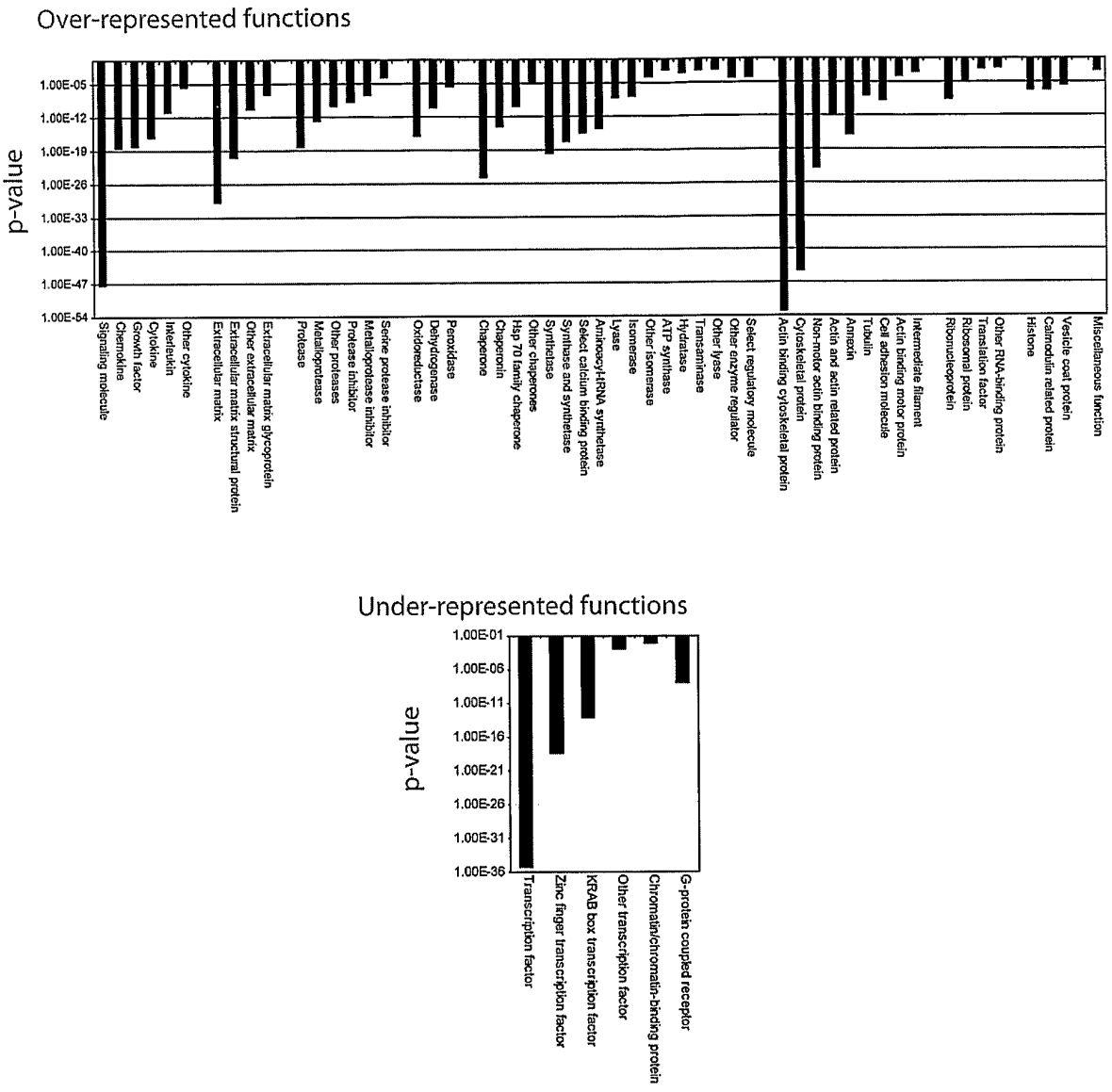

Over-represented functions
p-value
1.00E-05
1.00E-12
1.00E-19
1.00E-26
1.00E-33
1.00E-40
1.00E-47
1.00E-54
Signaling molecule
Chemokine
Growth factor
Cytokine
Interleukin
Other cytokine
Extracellular matrix
Extracellular matrix structural protein
Other extracellular matrix
Extracellular matrix glycoprotein
Protease
Metalloprotease
Other proteases
Protease inhibitor
Metalloprotease inhibitor
Serine protease inhibitor
Oxidoreductase
Dehydrogenase
Peroxidase
Chaperone
Chaperonin
Other chaperones
Hsp 70 family chaperone
Synthetase
Synthetase and synthetase
Select calcium binding protein
Aminoacyl-tRNA synthetase
Lyase
Isomerase
Other isomerase
ATP synthase
Hydratase
Transaminase
Other lyase
Other enzyme regulator
Select regulatory molecule
Actin binding cytoskeletal protein
Cytoskeletal protein
Non-motor actin binding protein
Actin and actin related protein
Annexin
Tubulin
Cell adhesion molecule
Actin binding motor protein
Intermediate filament
Ribonucleoprotein
Ribosomal protein
Translation factor
Other RNA-binding protein
Histone
Calmodulin related protein
Vesicle coat protein
Miscellaneous function
Under-represented functions
p-value
1.00E-01
1.00E-06
1.00E-11
1.00E-16
1.00E-21
1.00E-26
1.00E-31
1.00E-36
Transcription factor
Zinc finger transcription factor
KRAB box transcription factor
Other transcription factor
Chromatin/chromatin-binding protein
G-protein coupled receptor

FIGURE 15

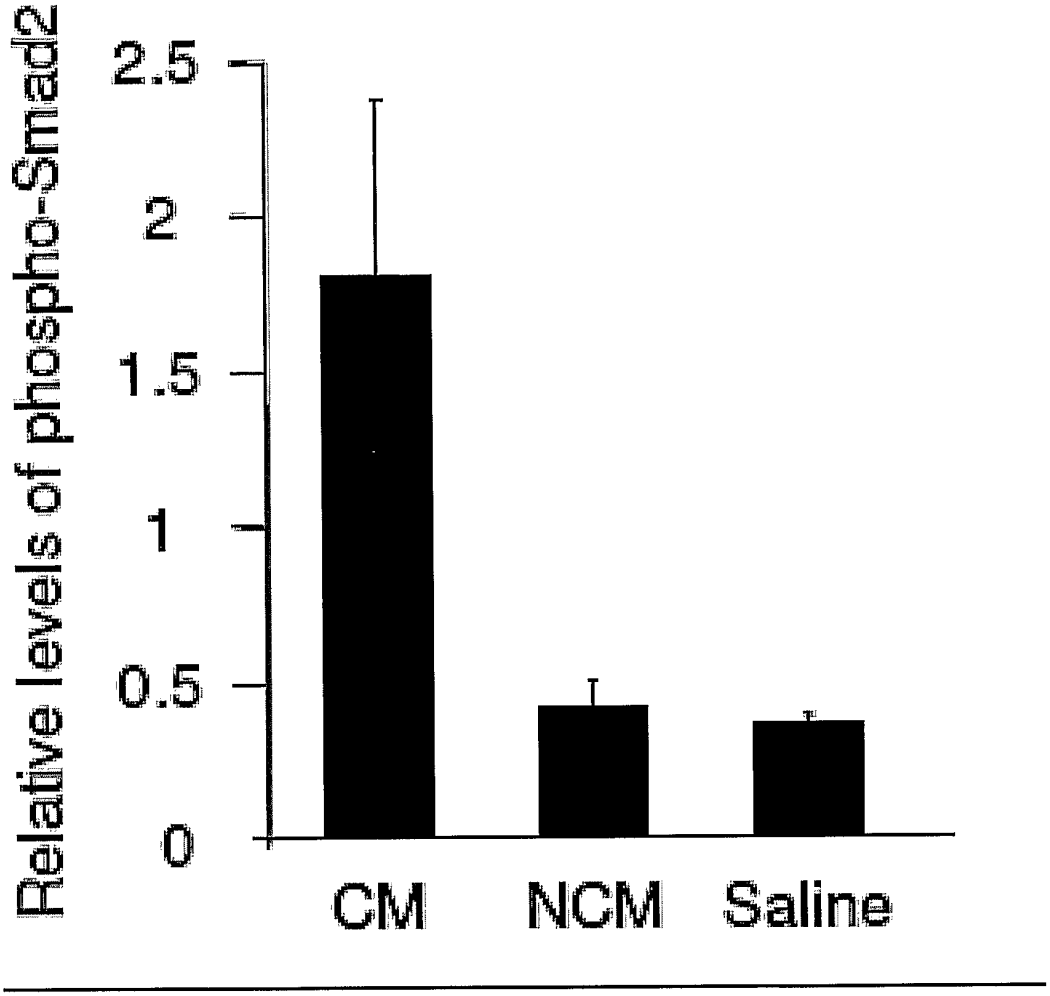


FIGURE 16

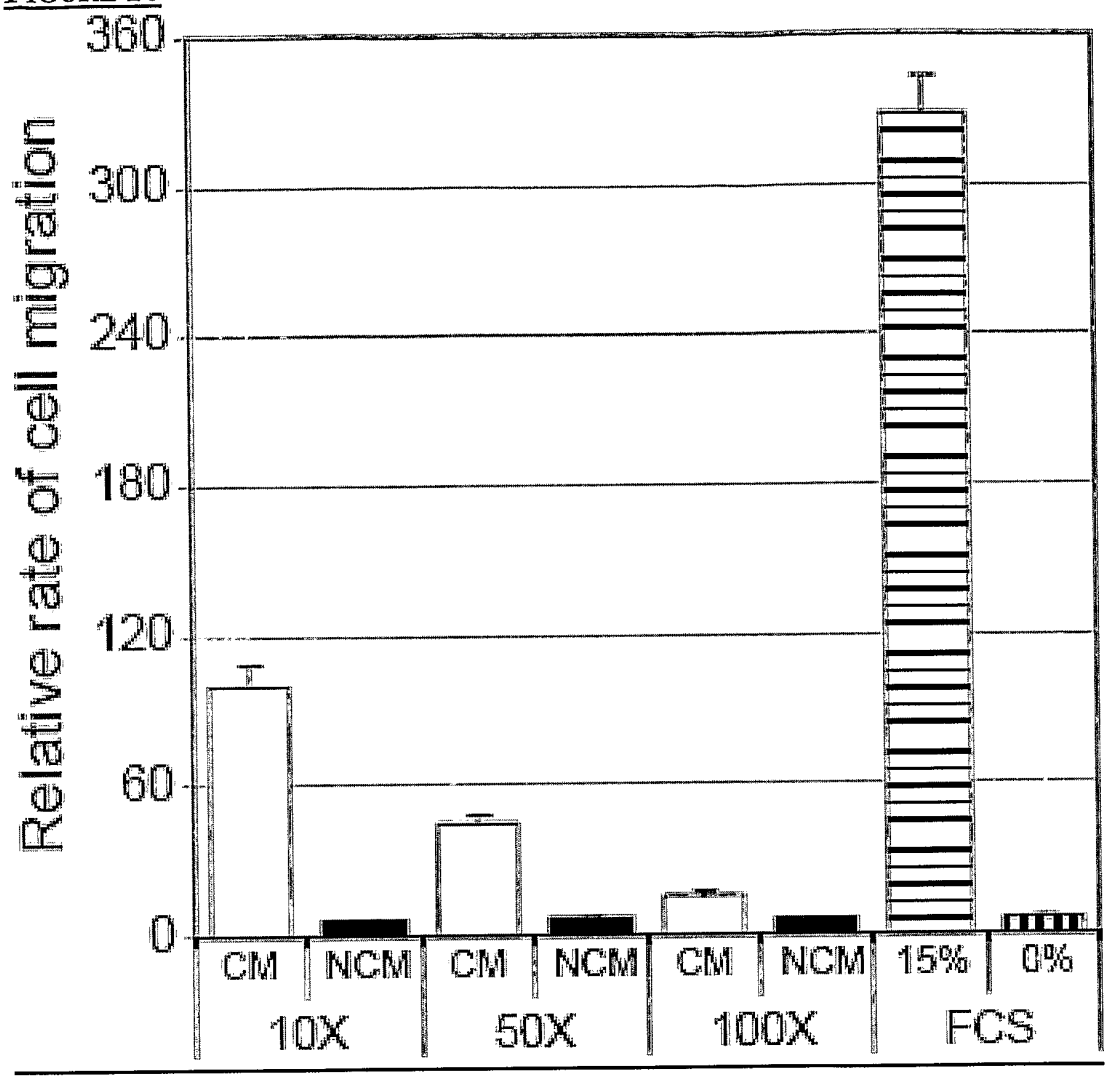

Relative rate of cell migration
360
300
240
180
120
60
0
CM
NCM
CM
NCM
CM
NCM
15%
0%
10X
50X
100X
FCS

FIGURE 17

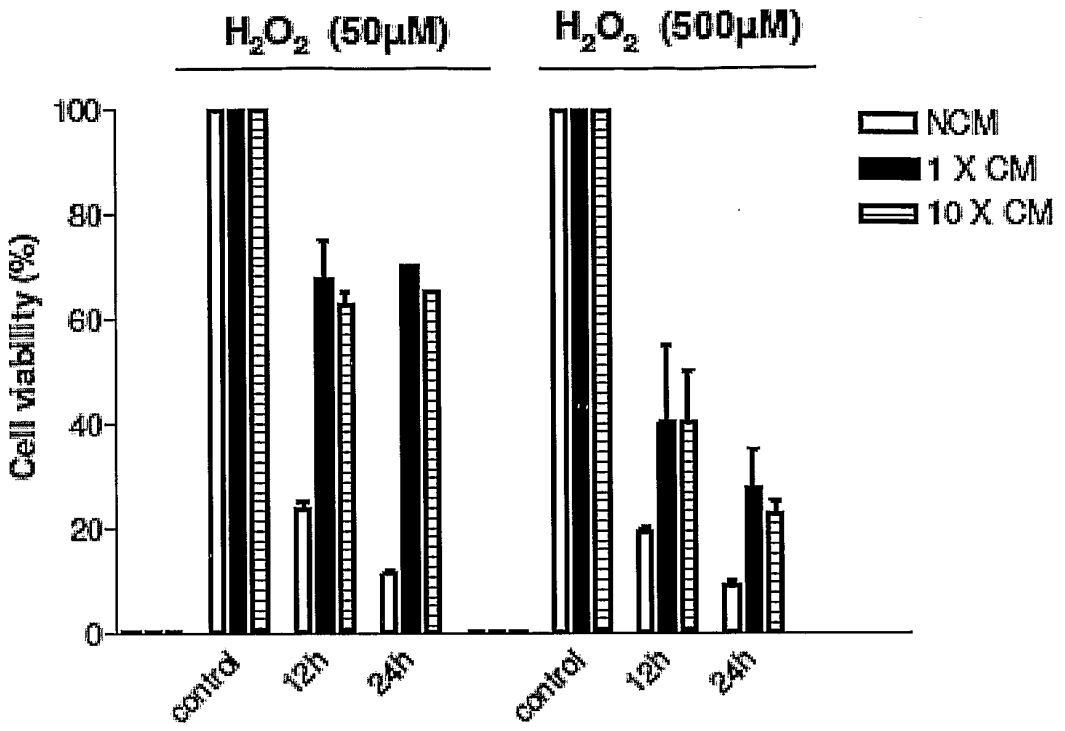

H2O2 (50µM)
H2O2 (500µM)
NCM
1 X CM
10 X CM
Cell viability (%)
100
80
60
40
20
0
control
12h
24h
control
12h
24h

FIGURE 18

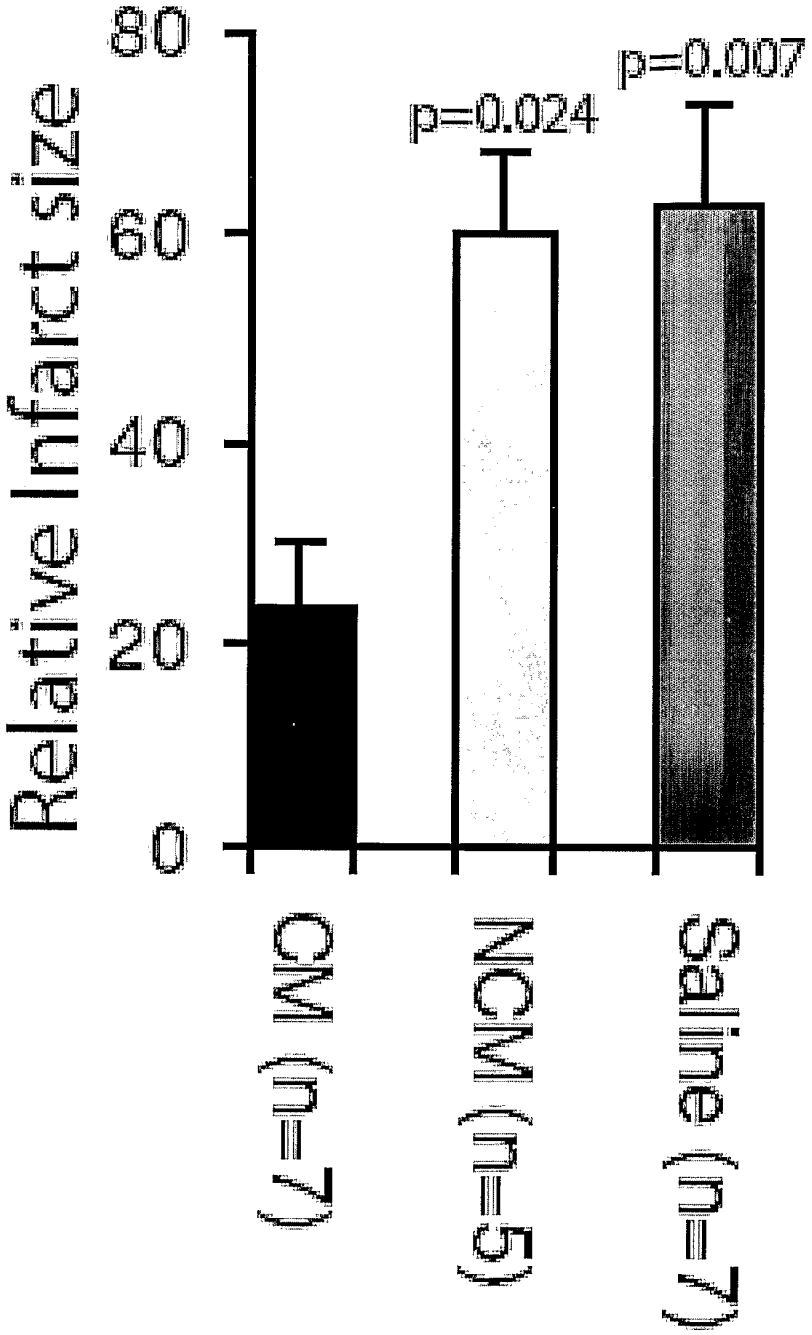

Relative Infarct size
80
60
40
20
0
p=0.024
p=0.007
(V=1) IWP
(5=1) NCN
(V=1) saline

FIGURE 19

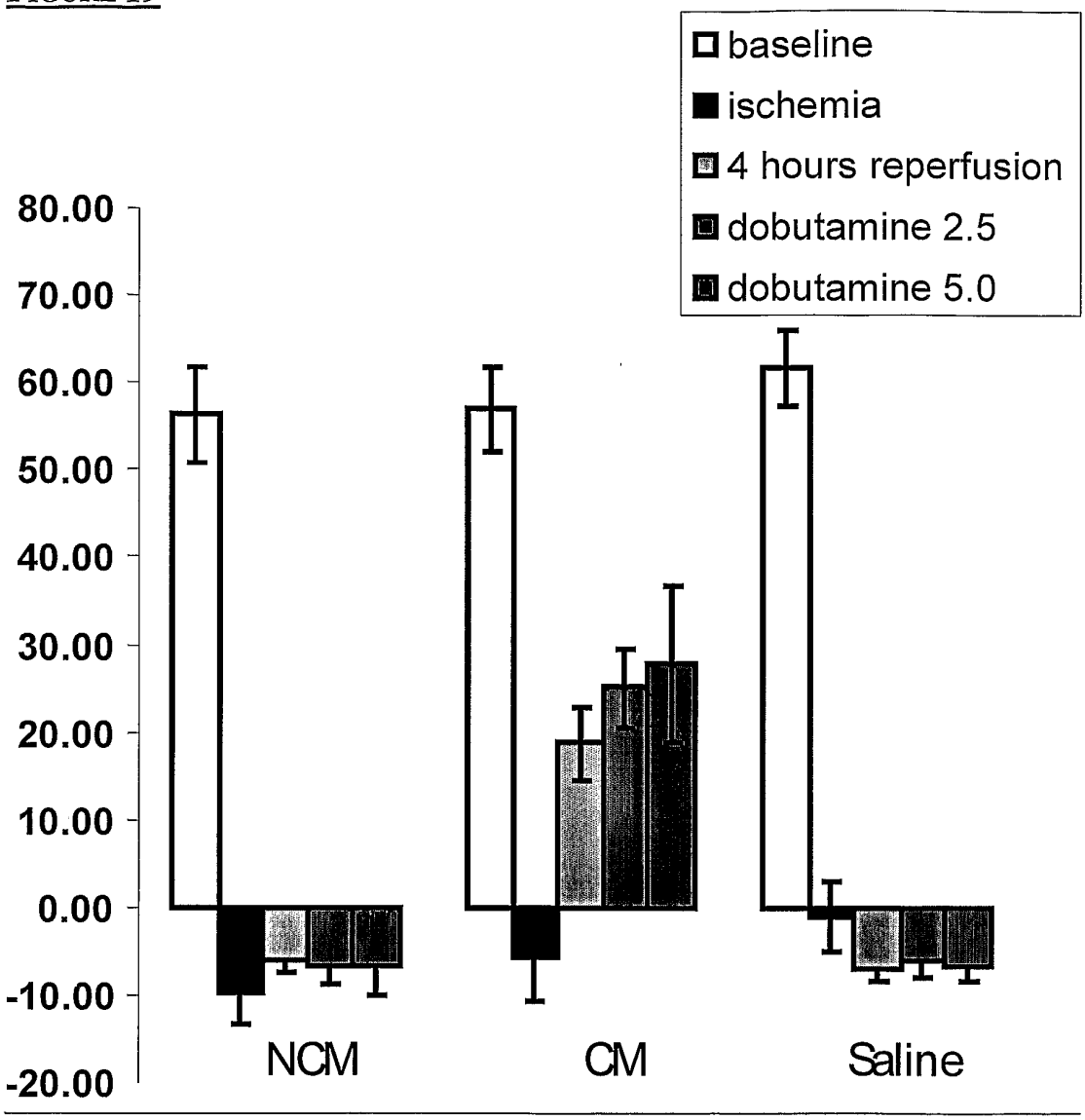
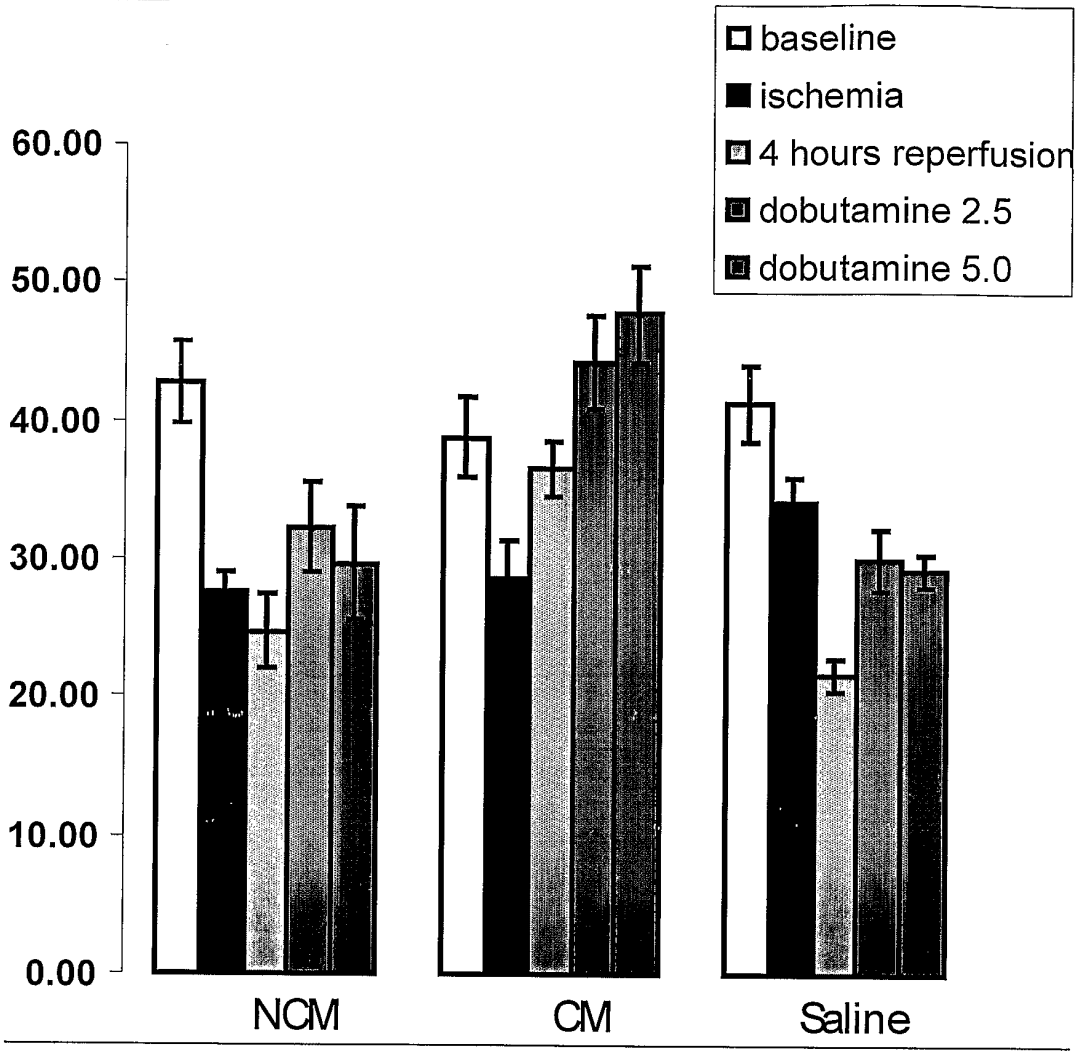

baseline
ischemia
4 hours reperfusion
dobutamine 2.5
dobutamine 5.0
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
NCM
CM
Saline

FIGURE 20


baseline
ischemia
4 hours reperfusion
dobutamine 2.5
dobutamine 5.0
60.00
50.00
40.00
30.00
20.00
10.00
0.00
NCM
CM
Saline