FIG. 1A

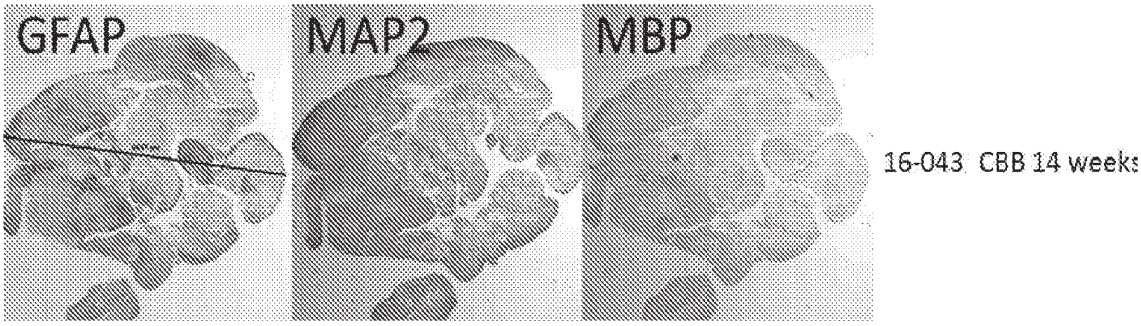

GFAP
MAP2
MBP
16-043 CBB 14 weeks

FIG. 1B

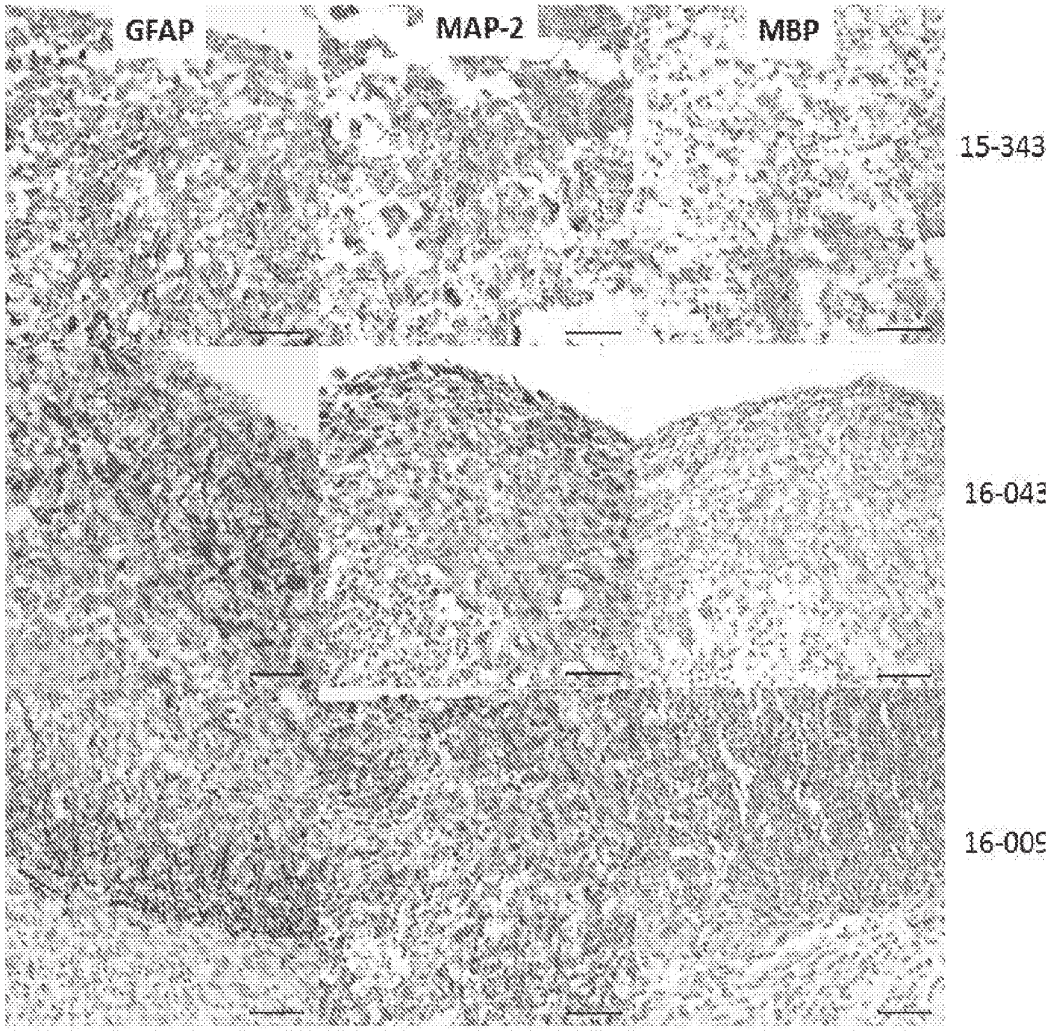

GFAP
MAP-2
MBP
15-343
16-043
16-009

FIG. 2

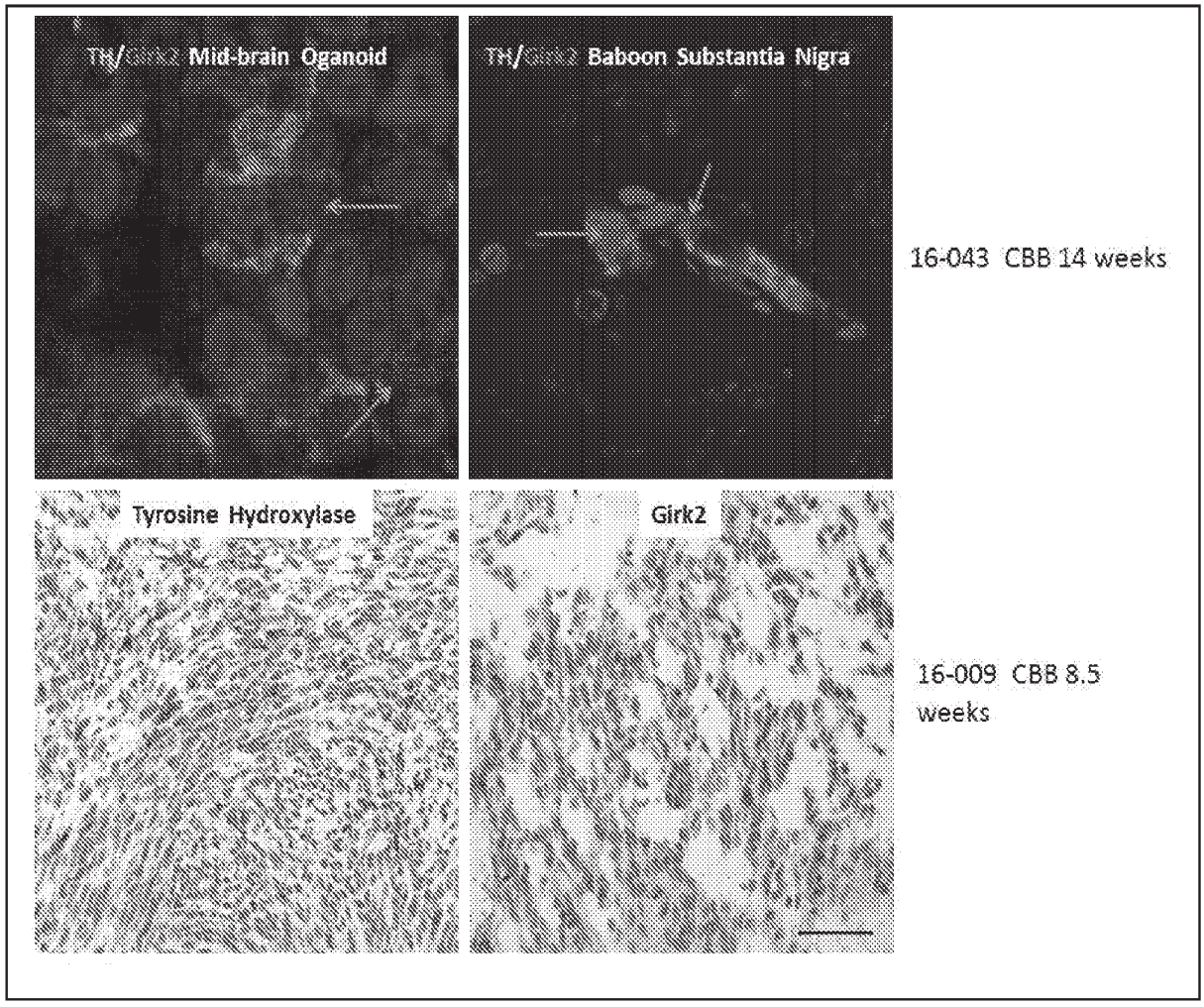

TH/Girk2 Mid-brain Oganoid
TH/Girk2 Baboon Substantia Nigra
16-043 CBB 14 weeks
Tyrosine Hydroxylase
Girk2
16-009 CBB 8.5 weeks

FIG. 3

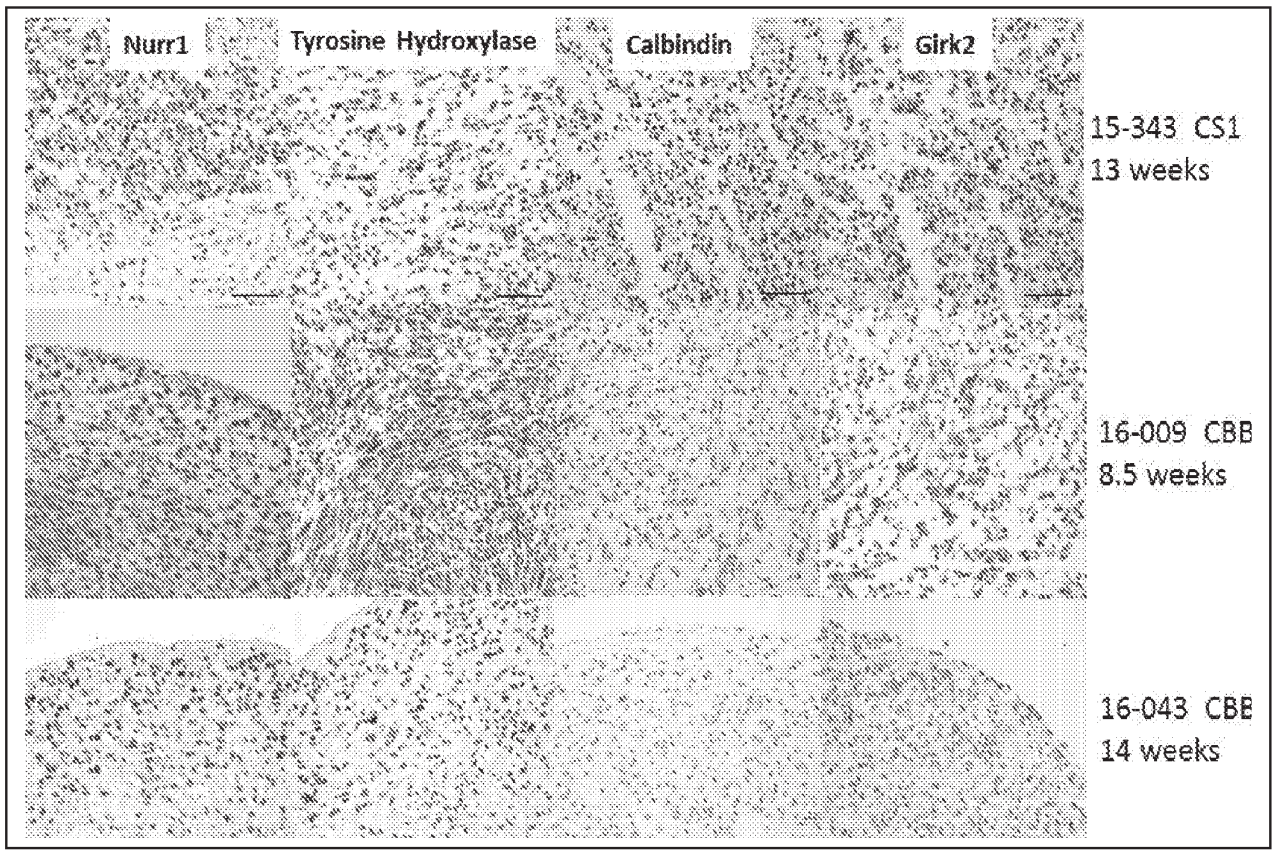

Nurr1
Tyrosine Hydroxylase
Calbindin
Girk2
15-343 CS1
13 weeks
16-009 CBB
8.5 weeks
16-043 CBB
14 weeks

FIG. 4

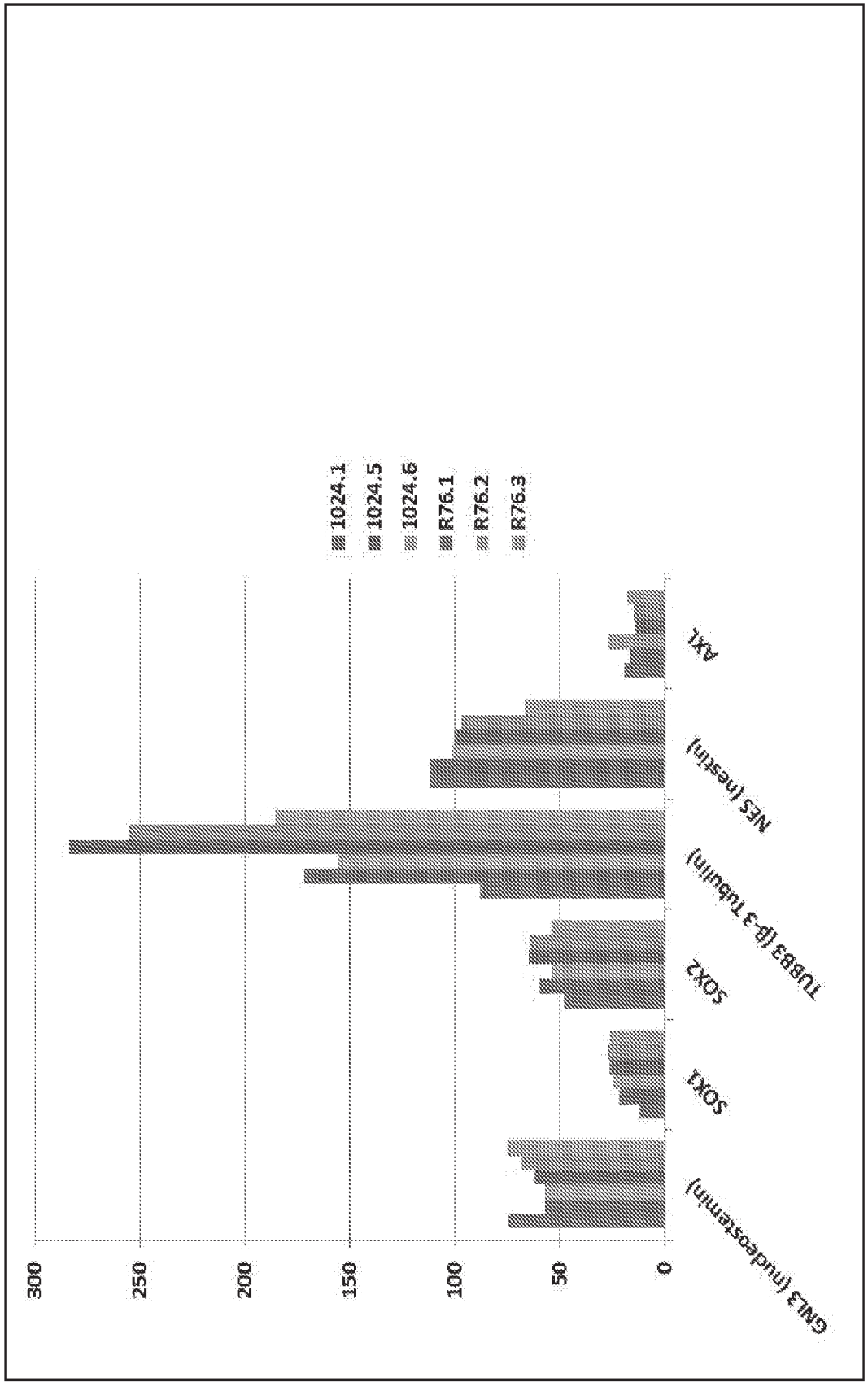

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
300
250
200
150
100
50
0
GNL3 (nucleostemin)
SOX1
SOX2
TUBB3 (β-3 Tubulin)
NES (nestin)
AXL

FIG. 5

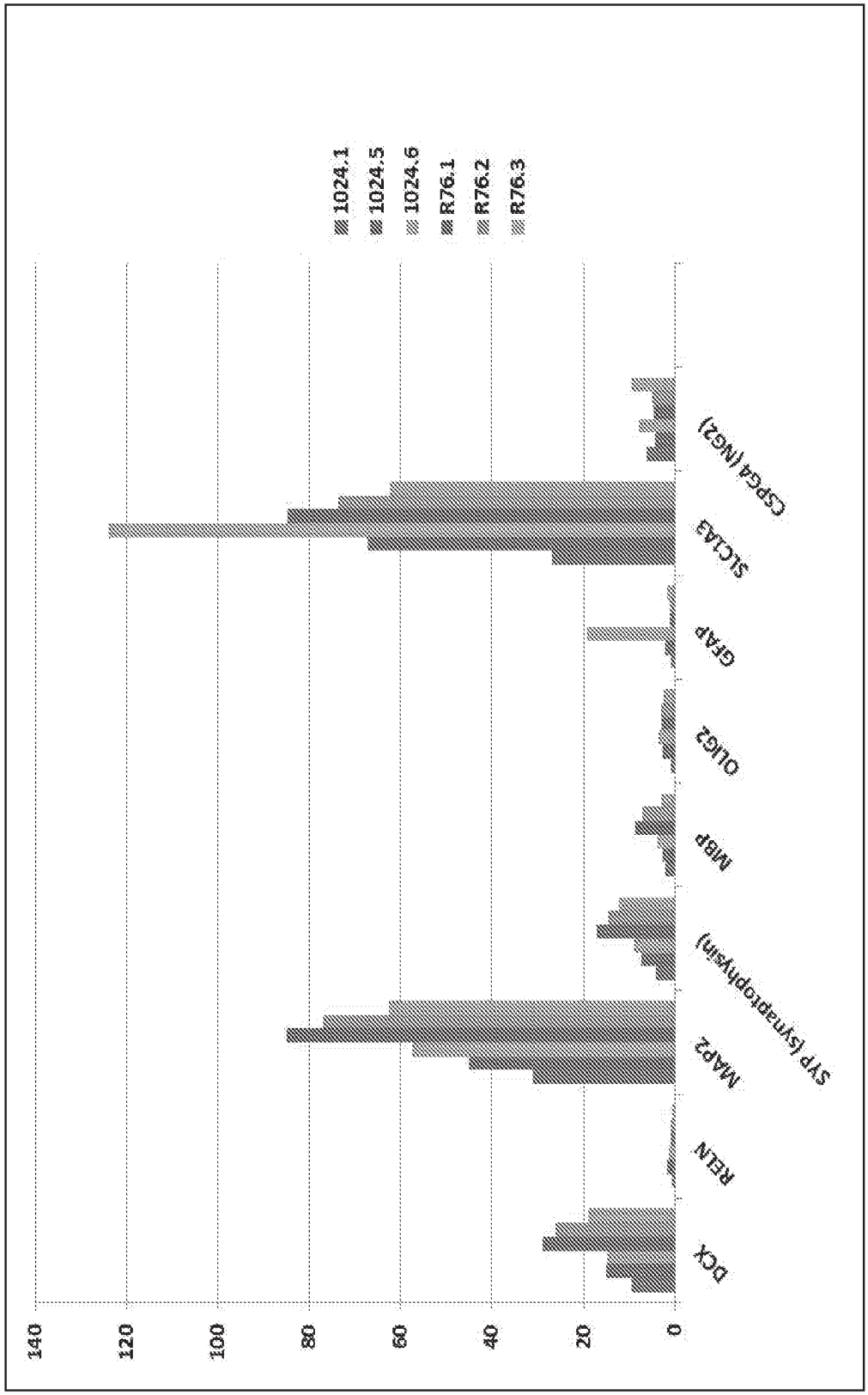

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
140
120
100
80
60
40
20
0
DCX
RELN
MAP2
SYP (synaptophysin)
MBP
OLIG2
GFAP
SLC1A3
CSPG4 (NG2)

FIG. 6

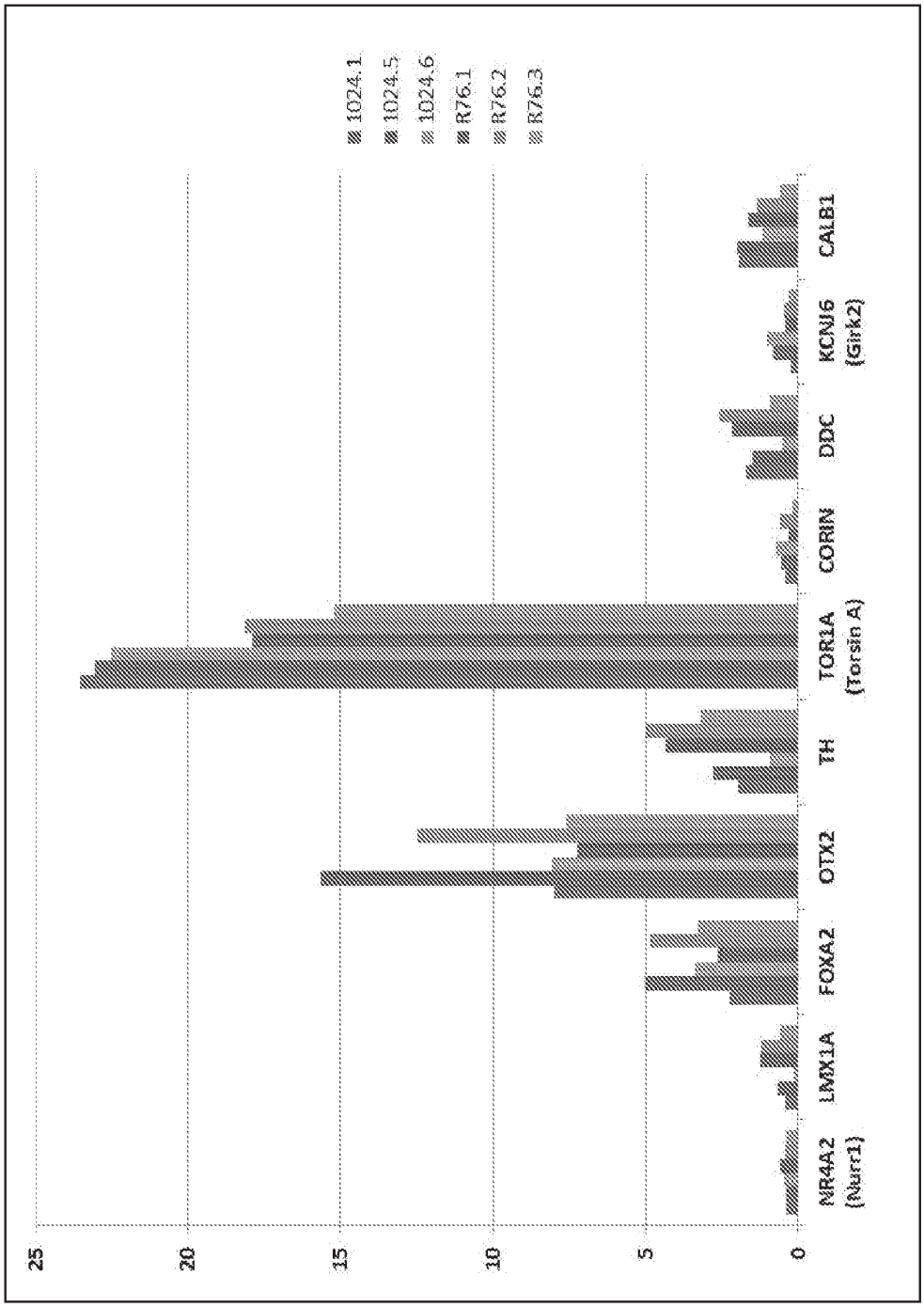

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
25
20
15
10
5
0
NR4A2 (Nurr1)
LMX1A
FOXA2
OTX2
TH
TOR1A (Torsin A)
CORIN
DDC
KCNJ6 (Girk2)
CALB1

FIG. 7

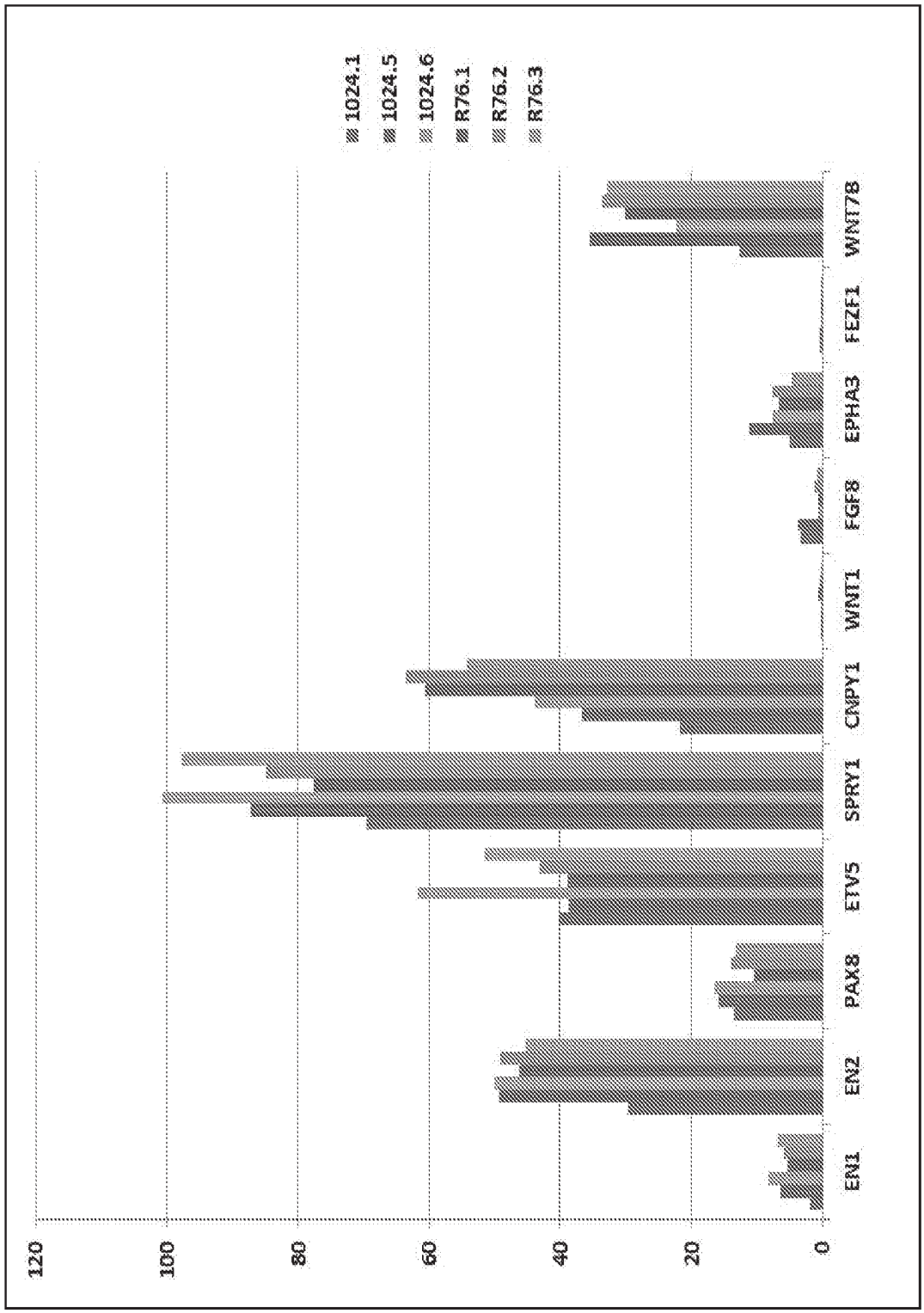

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
120
100
80
60
40
20
0
EN1
EN2
PAX8
ETV5
SPRY1
CMPY1
WNT1
FGF8
EPHA3
FEZF1
WNT7B

FIG. 8

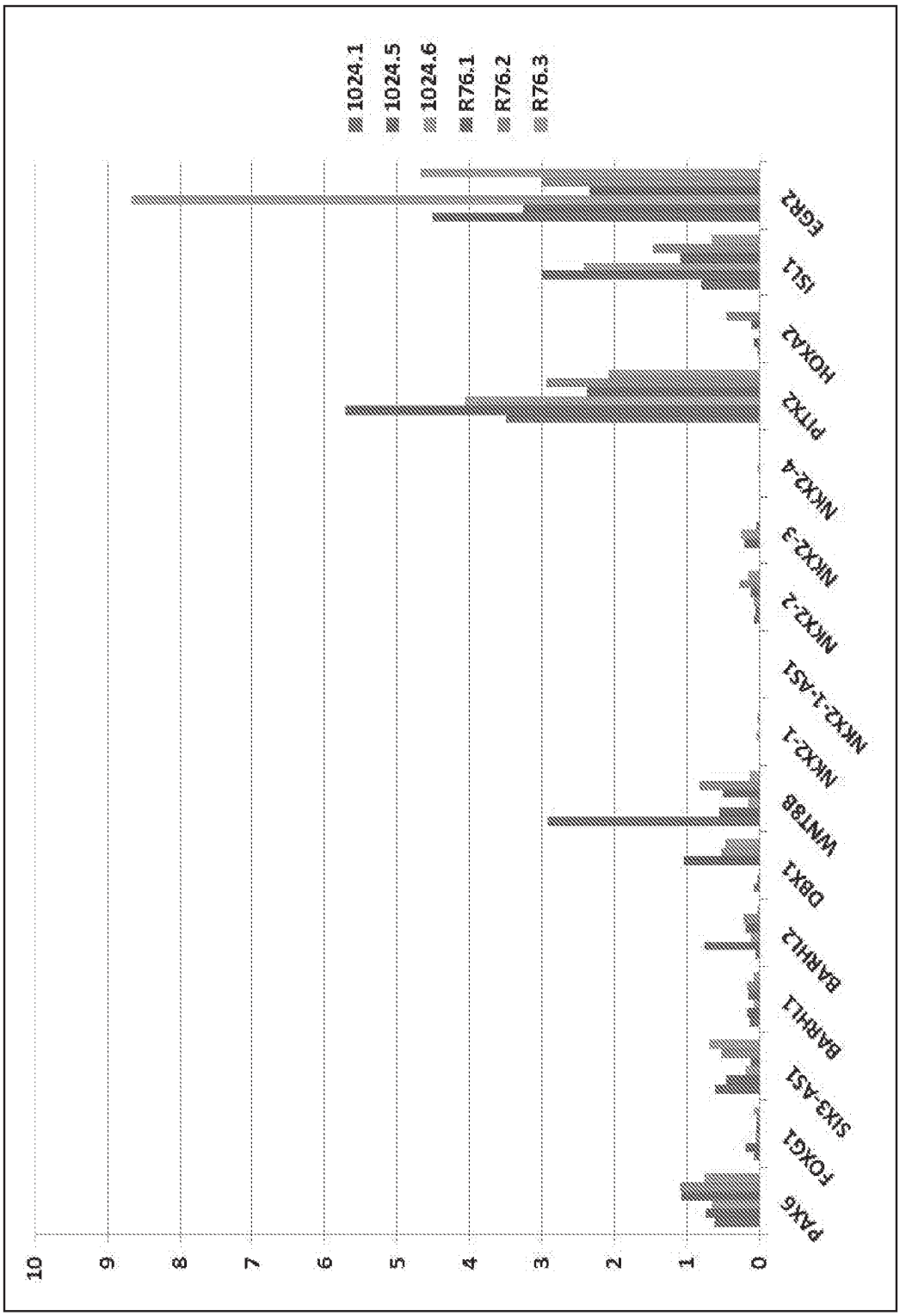

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
10
9
8
7
6
5
4
3
2
1
0
PAX6
FOXG1
SIX3-AS1
BARHL1
BARHL2
DBX1
WNT8B
NKX2-1
NKX2-1-AS1
NKX2-2
NKX2-3
NKX2-4
PITX2
HOXA2
ISL1
EGR2

FIG. 9

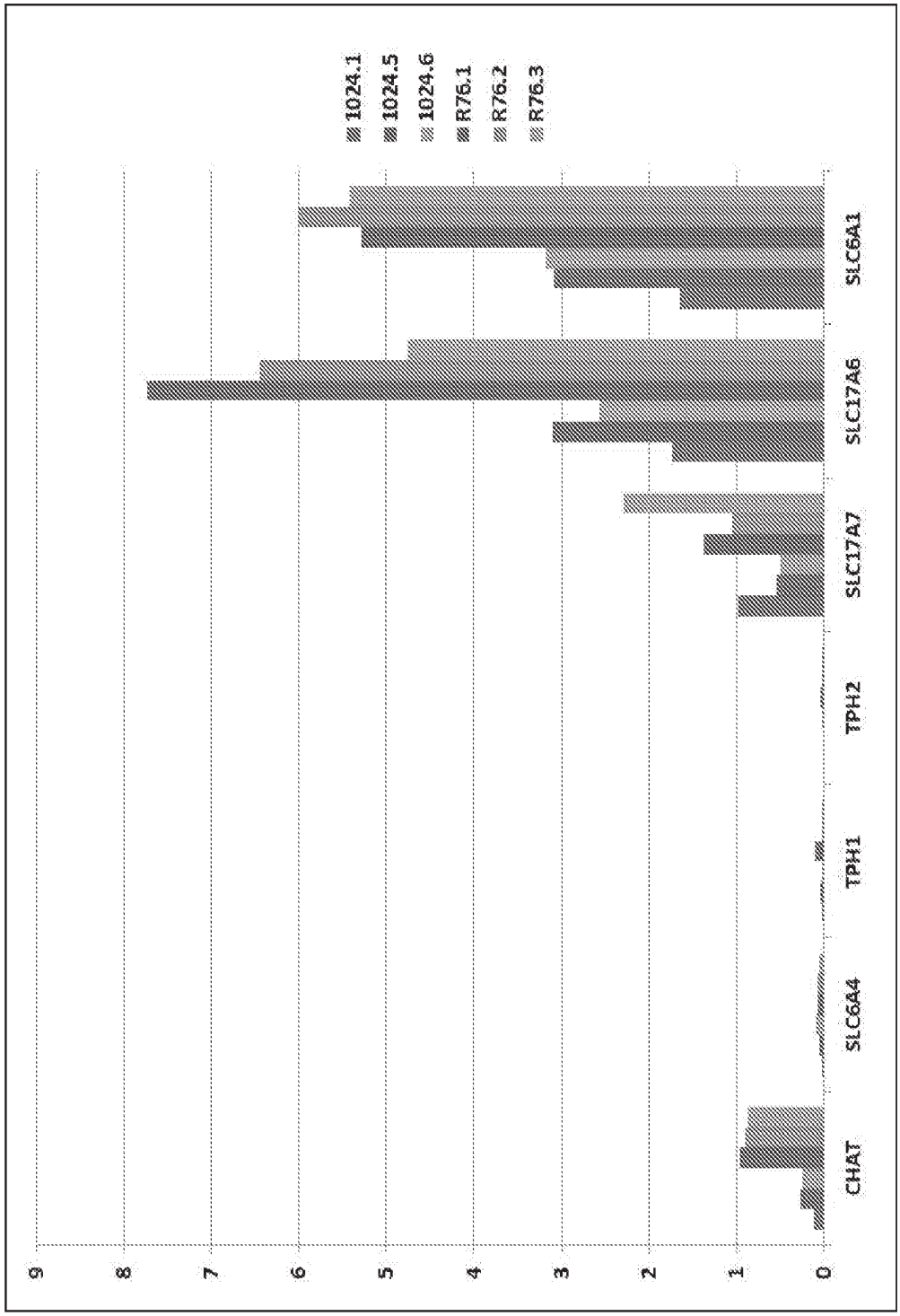

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
0
1
2
3
4
5
6
7
8
9
CHAT
SLC6A4
TPH1
TPH2
SLC17A7
SLC17A6
SLC6A1

FIG. 10

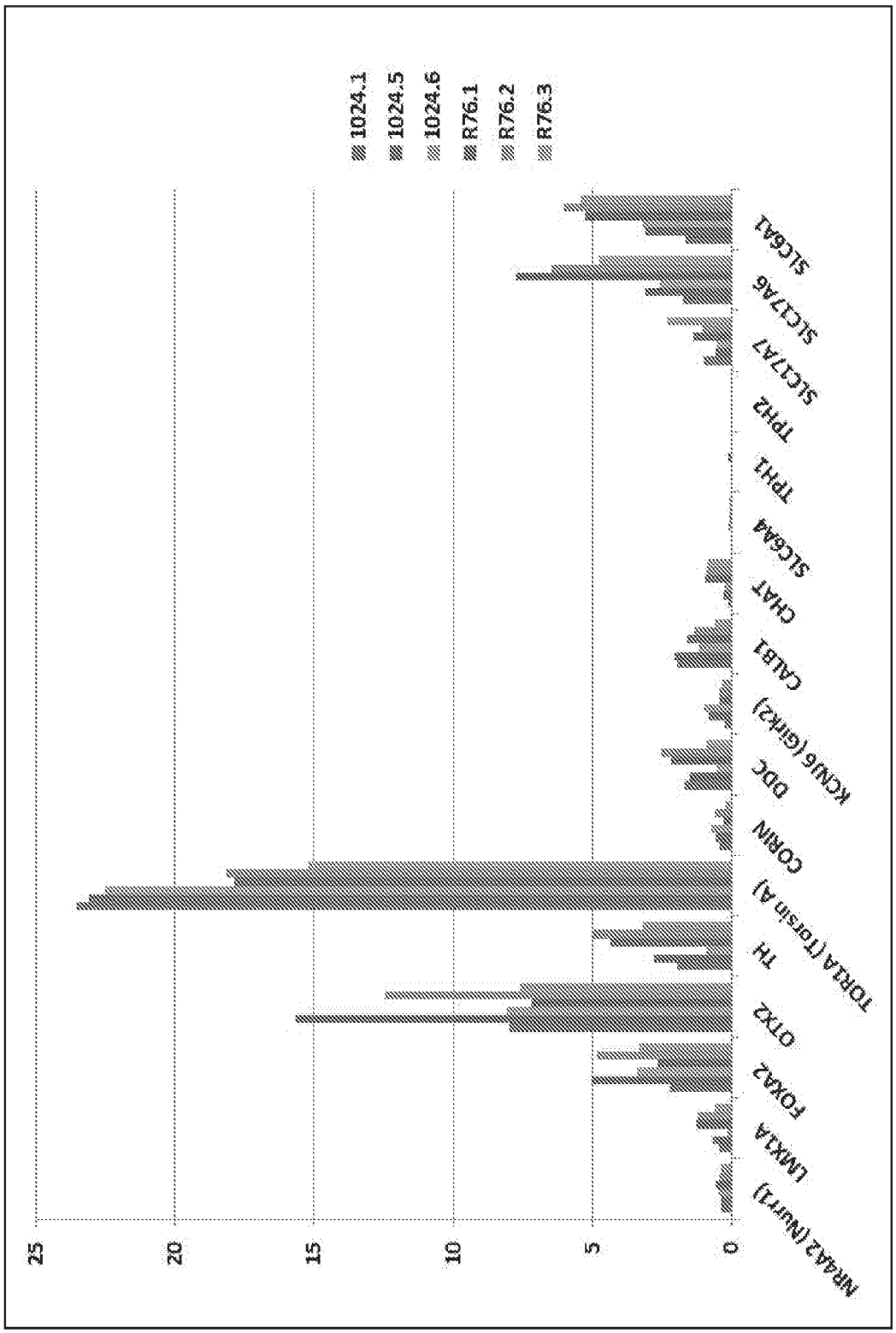
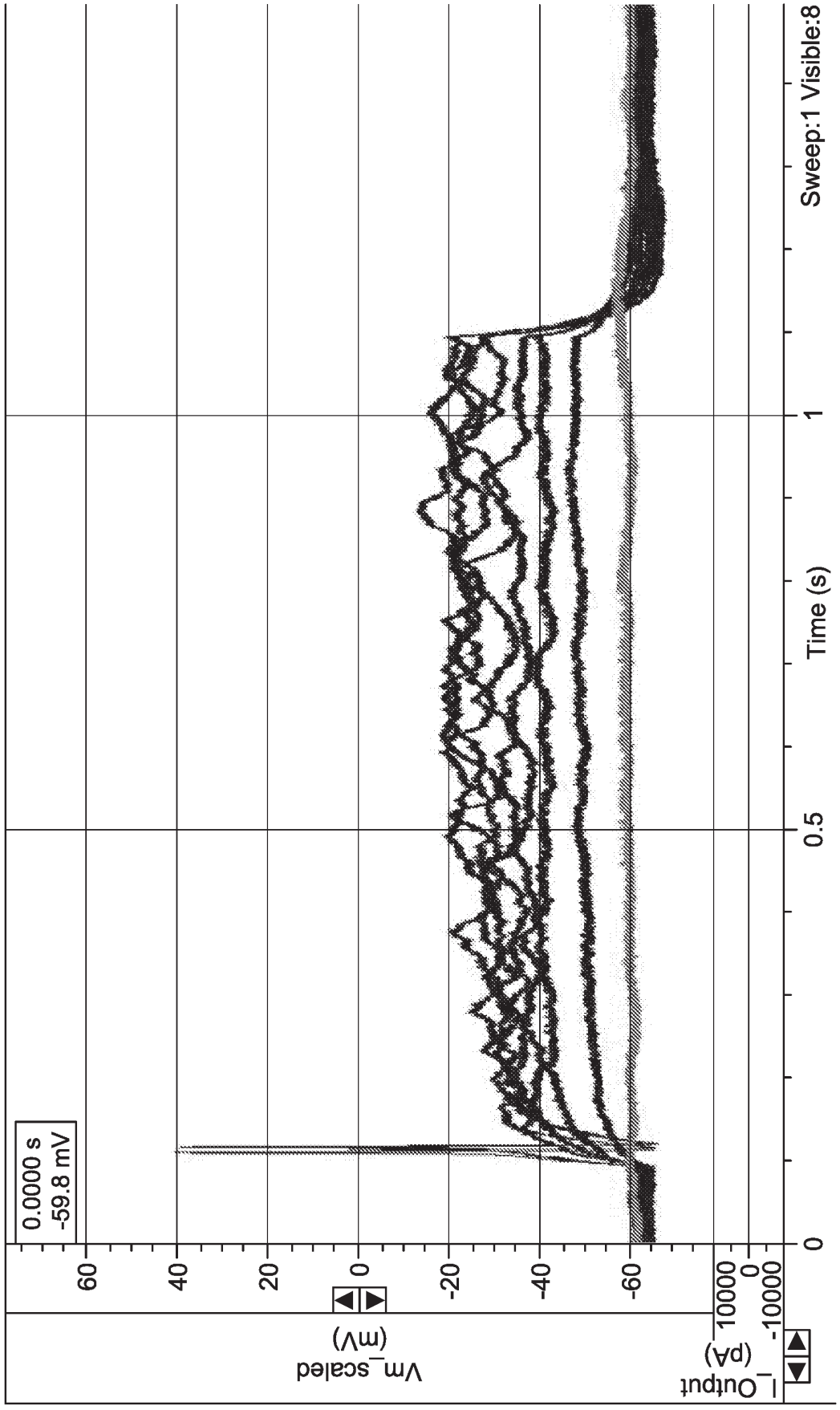

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
25
20
15
10
5
0
NR4A2 (Nurr1)
LMX1A
FOXA2
OTX2
TH
TORIA (Torsin A)
CORIN
DDC
KCNJ6 (GirK2)
CALB1
CHAT
SLC6A4
TPH1
TPH2
SLC17A7
SLC17A6
SLC6A1

FIG. 11A


0.0000 s
-59.8 mV
Vm_scaled
(mV)
I_Output
(pA)
Time (s)
Sweep:1 Visible:8
60
40
20
0
-20
-40
-60
10000
0
-10000
0
0.5
1

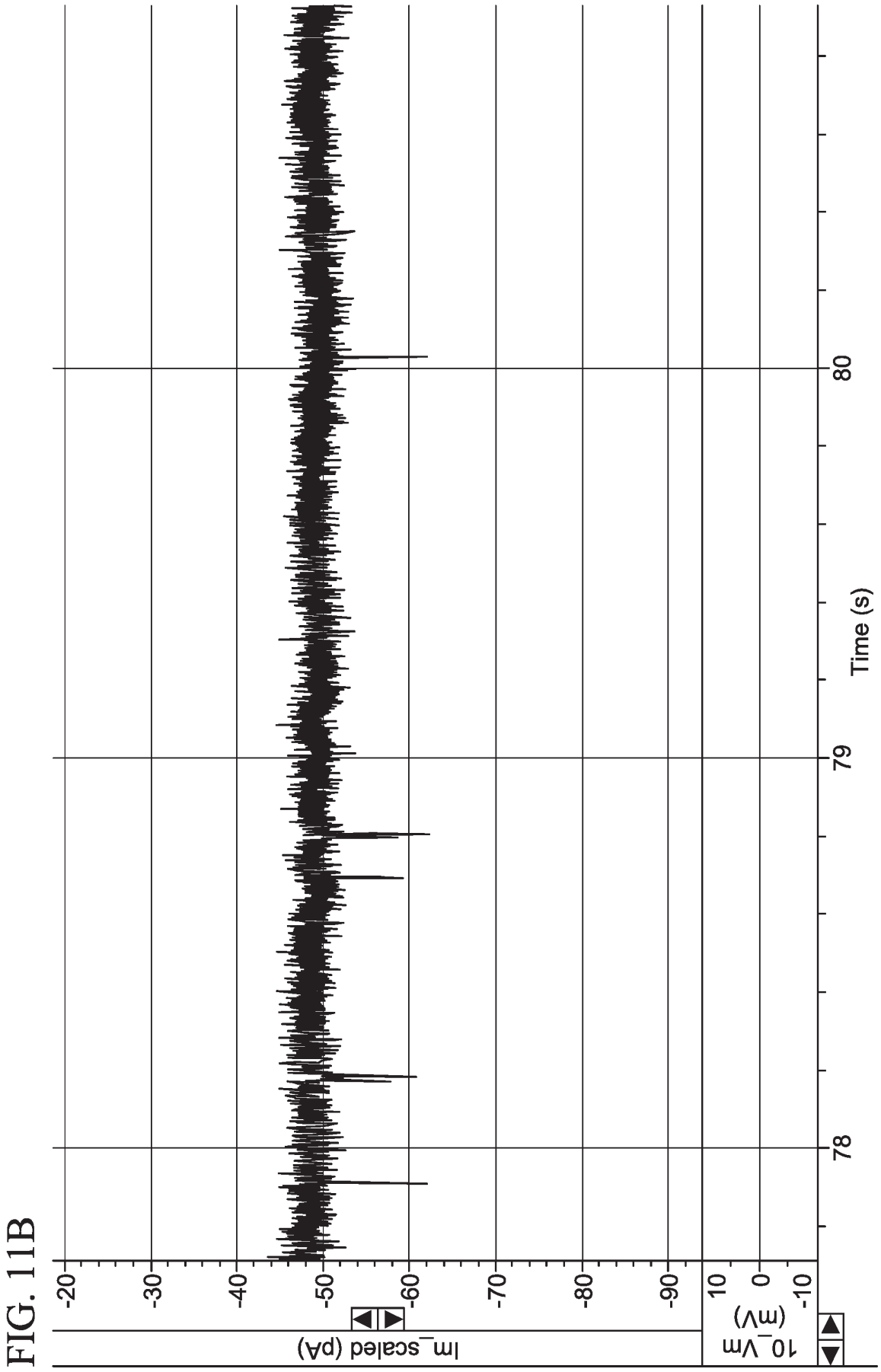


FIG. 11B

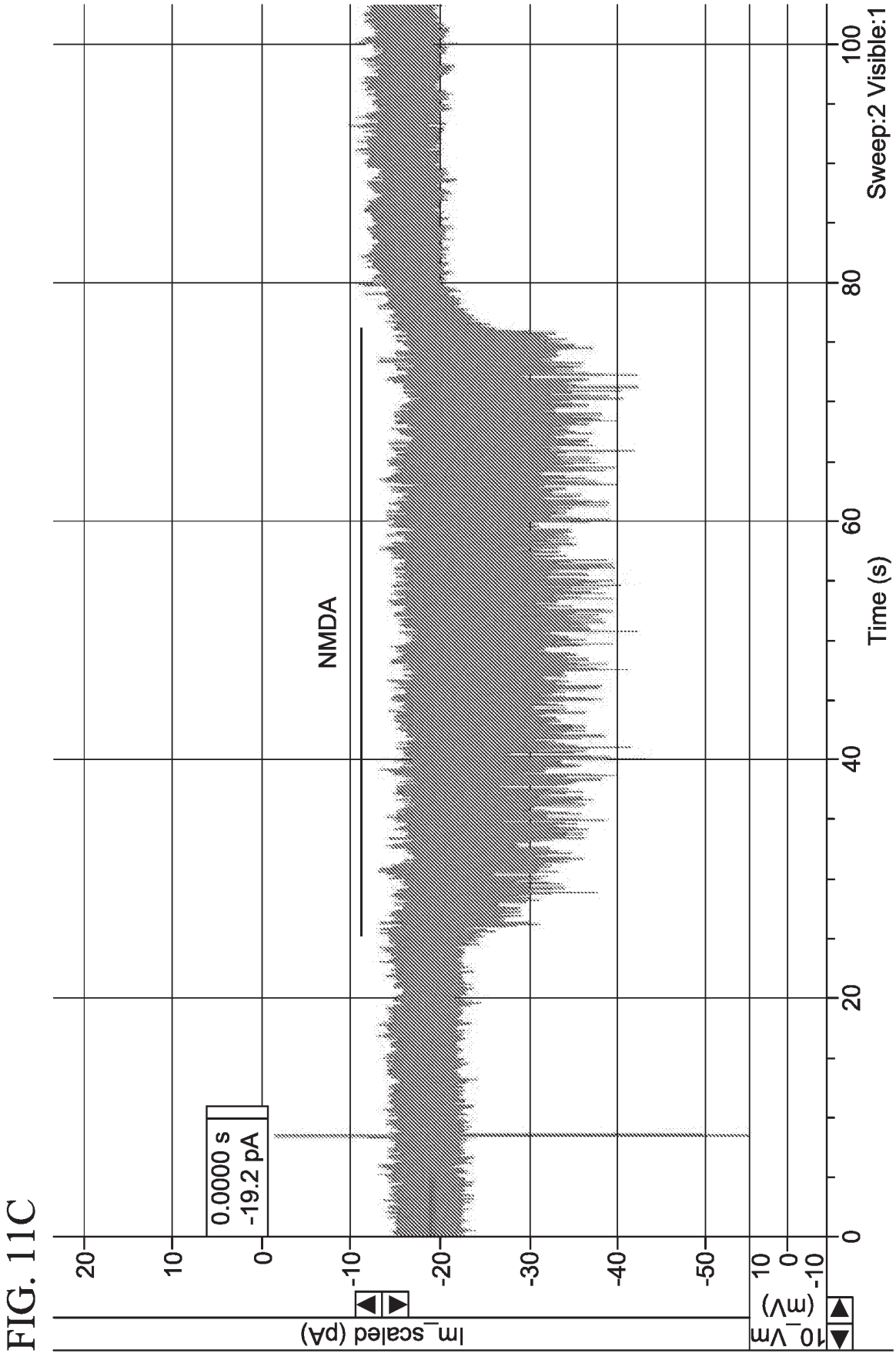

Sweep:2 Visible:1
Time (s)
NMDA
0.0000 s
-19.2 pA
Im_scaled (pA)
10_Vm (mV)

FIG. 11C

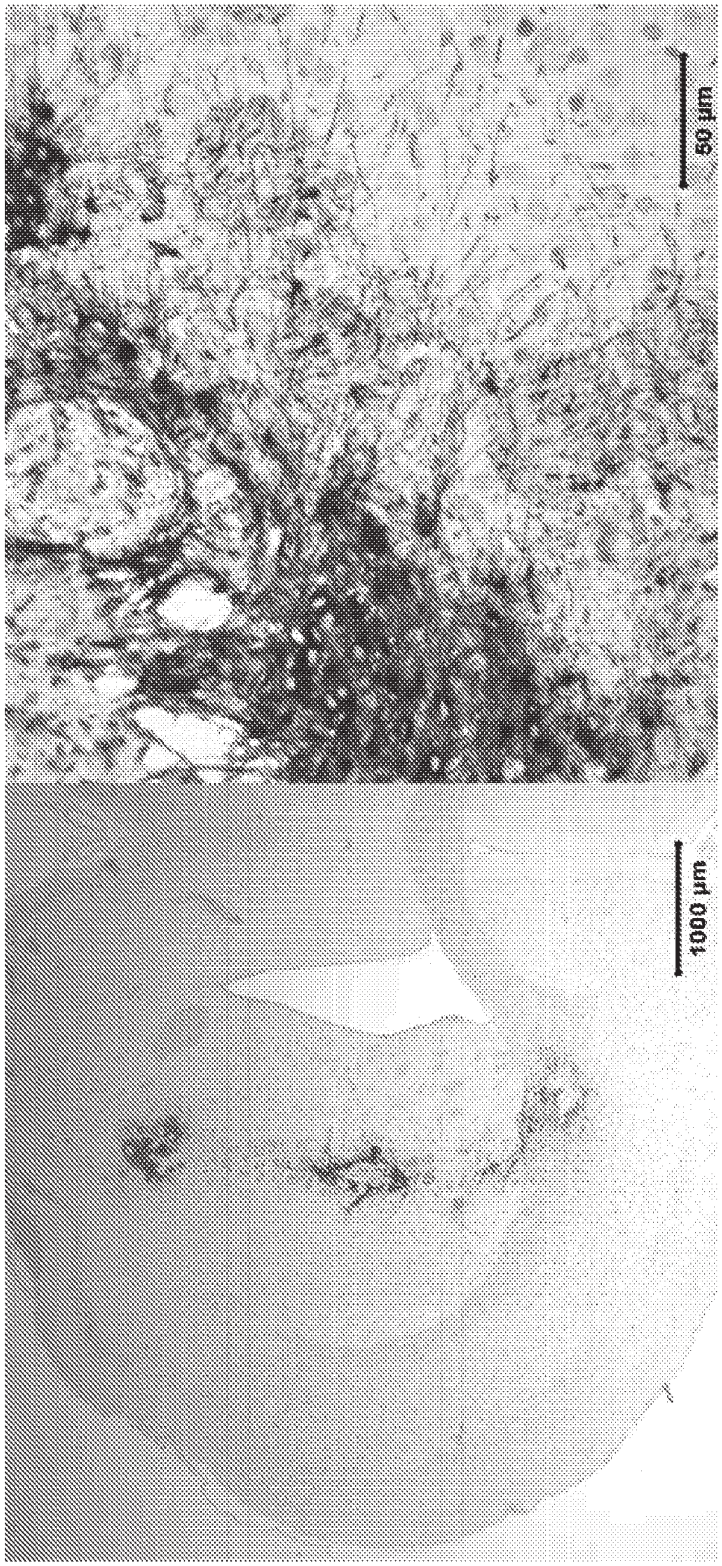
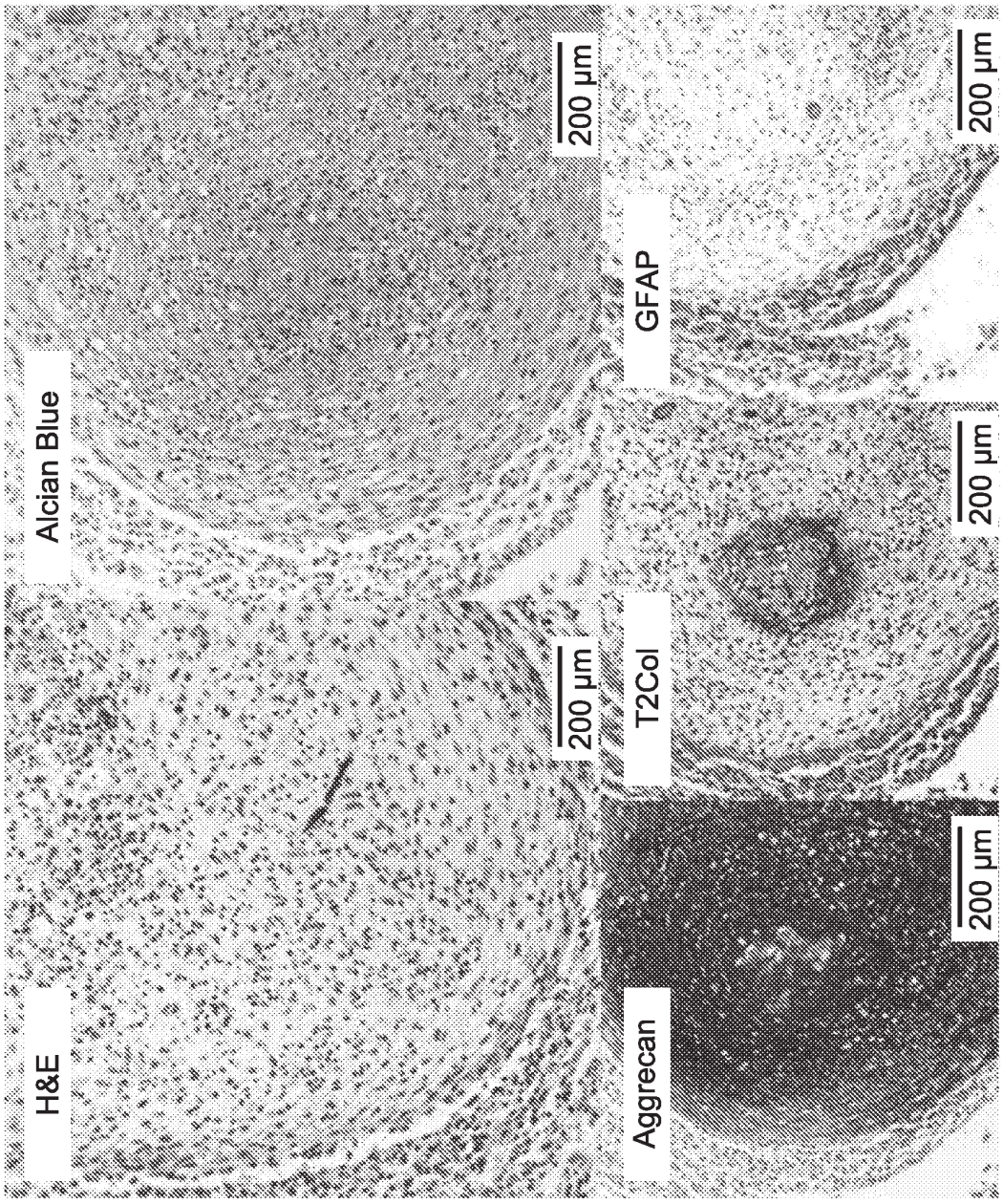


FIG. 12

FIG. 13


H&E
200 µm
Alcian Blue
200 µm
Aggrecan
200 µm
T2Col
200 µm
GFAP
200 µm

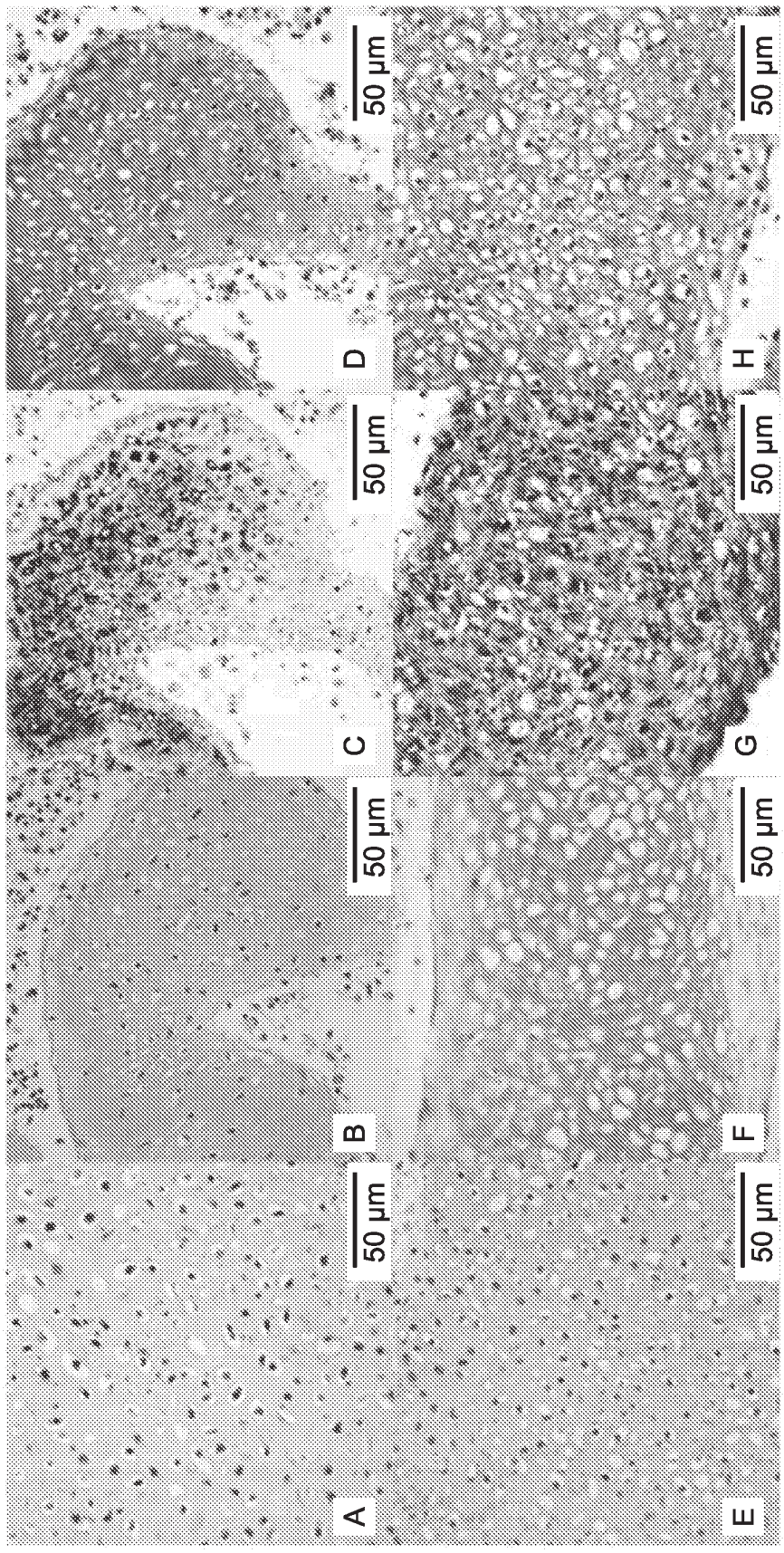
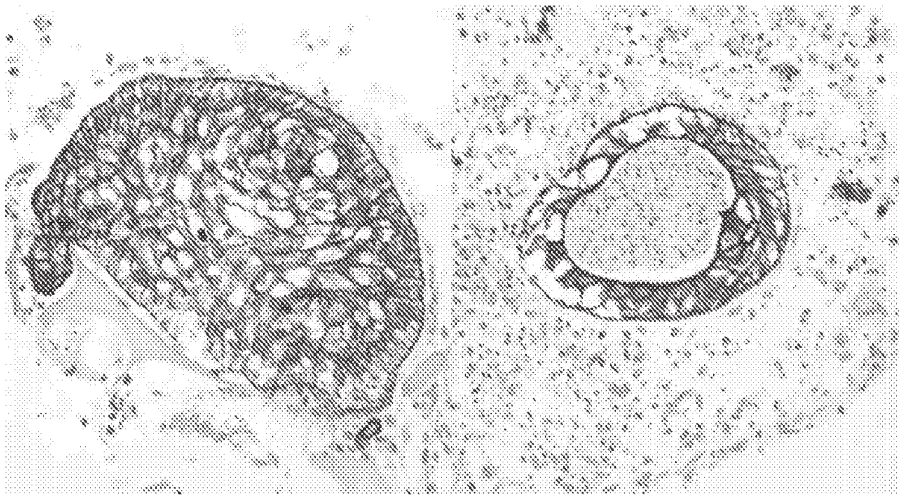


FIG. 14

FIG. 15



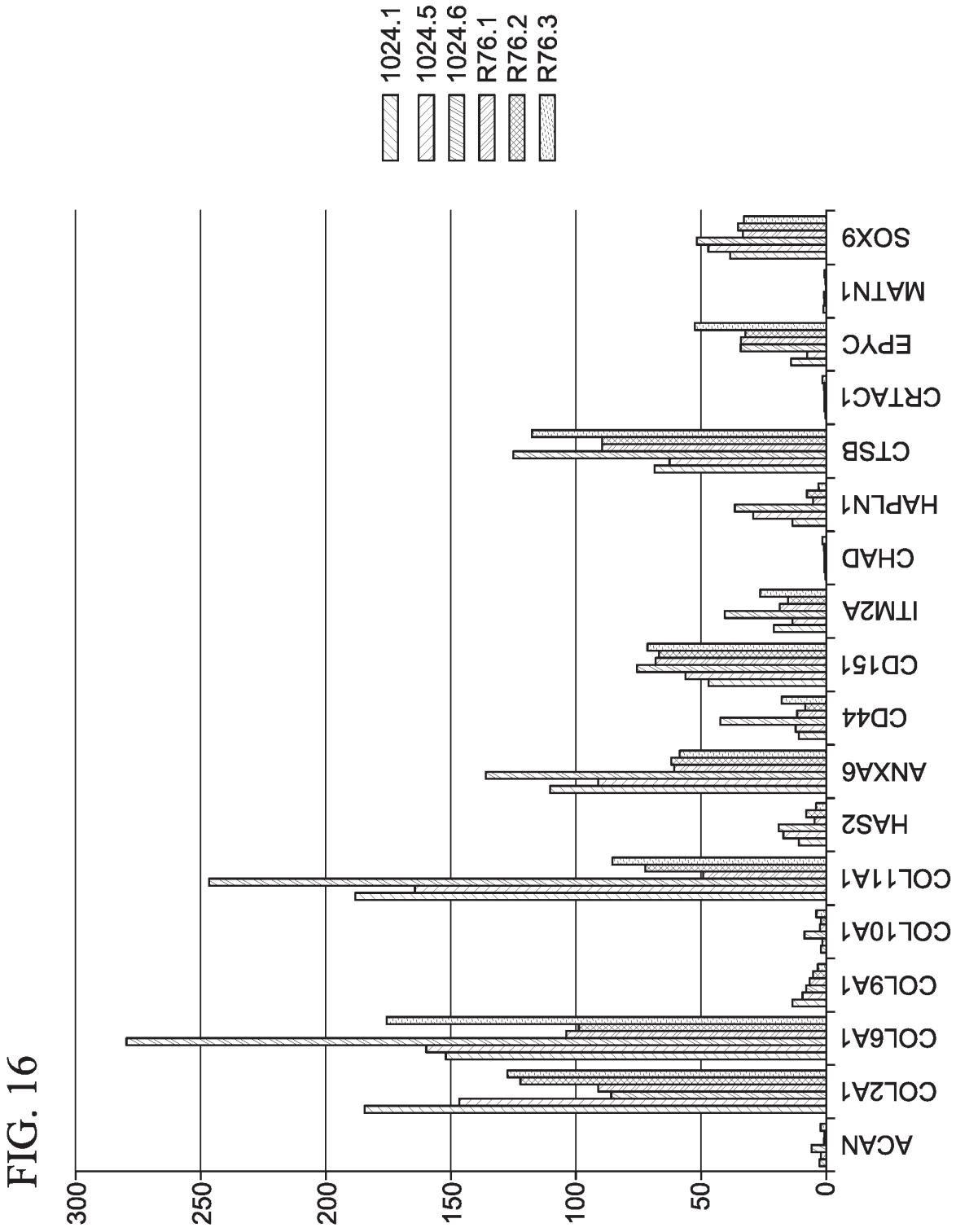

1024.1
1024.5
1024.6
R76.1
R76.2
R76.3
300
250
200
150
100
50
0
ACAN
COL2A1
COL6A1
COL9A1
COL10A1
COL11A1
HAS2
ANXA6
CD44
CD151
ITM2A
CHAD
HAPLN1
CTSB
CRTAC1
EPYC
MATN1
SOX9

FIG. 16

FIG. 17

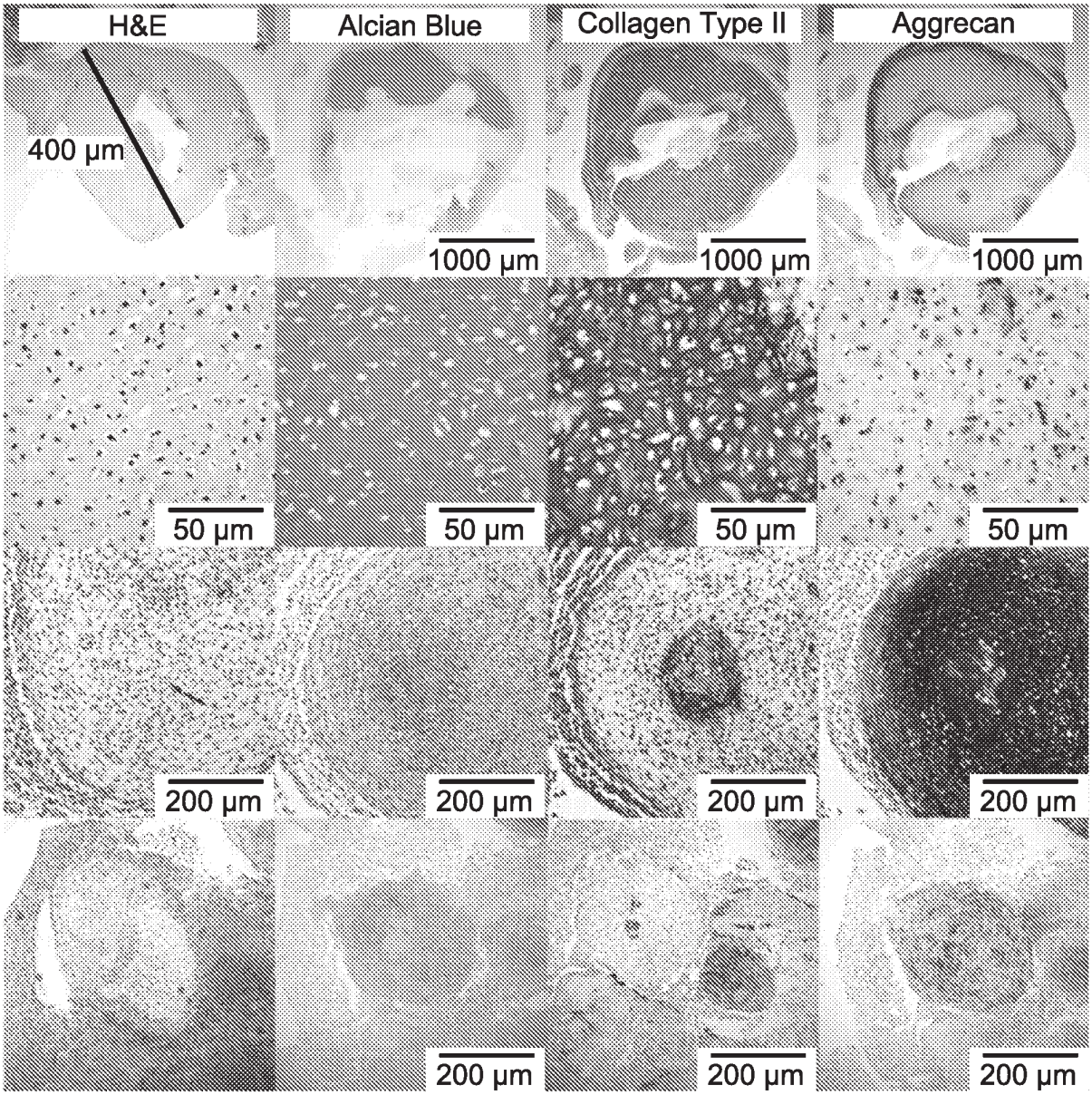

H&E
Alcian Blue
Collagen Type II
Aggrecan
400 µm
1000 µm
1000 µm
1000 µm
50 µm
50 µm
50 µm
50 µm
200 µm
200 µm
200 µm
200 µm
200 µm
200 µm
200 µm

FIG. 18

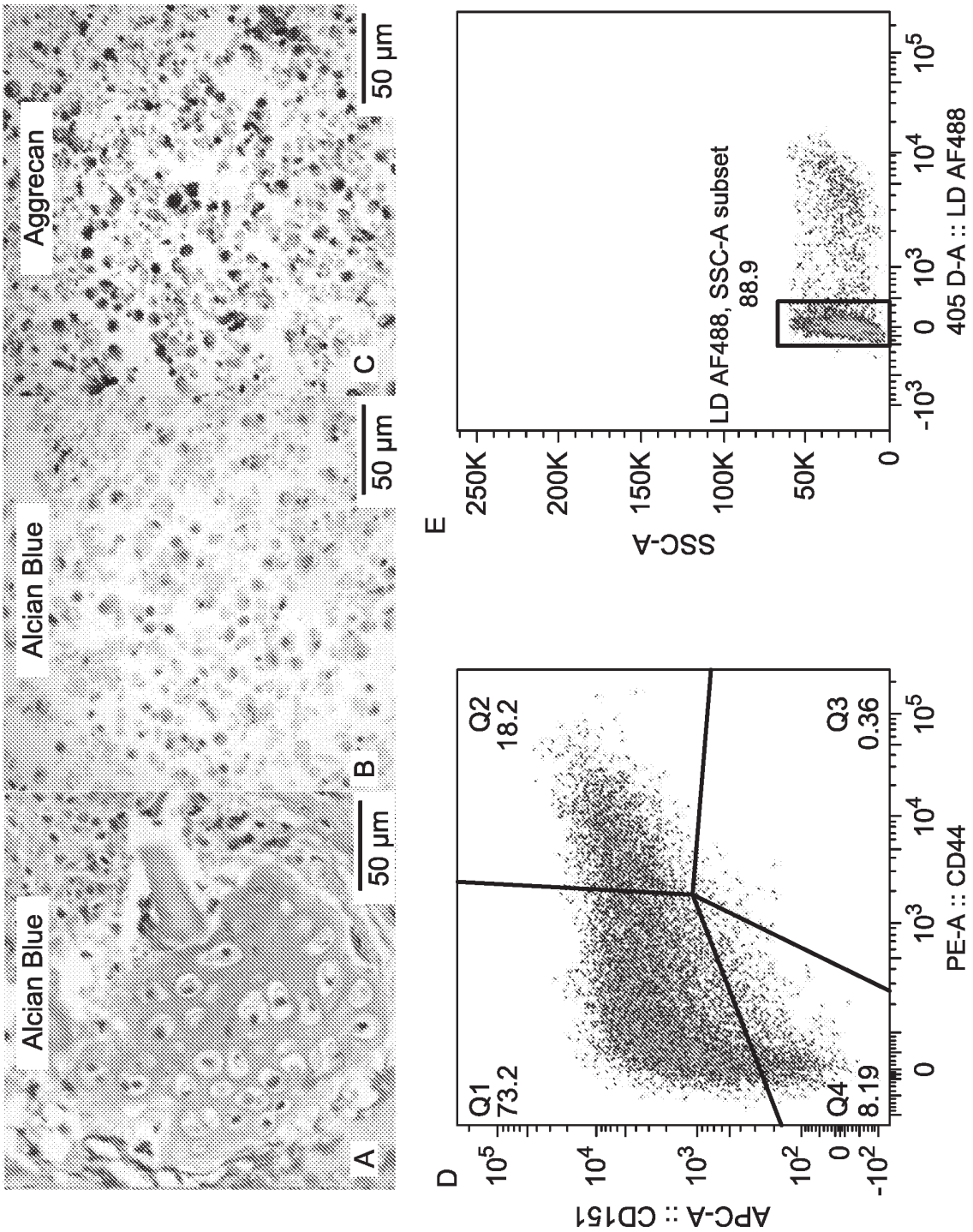
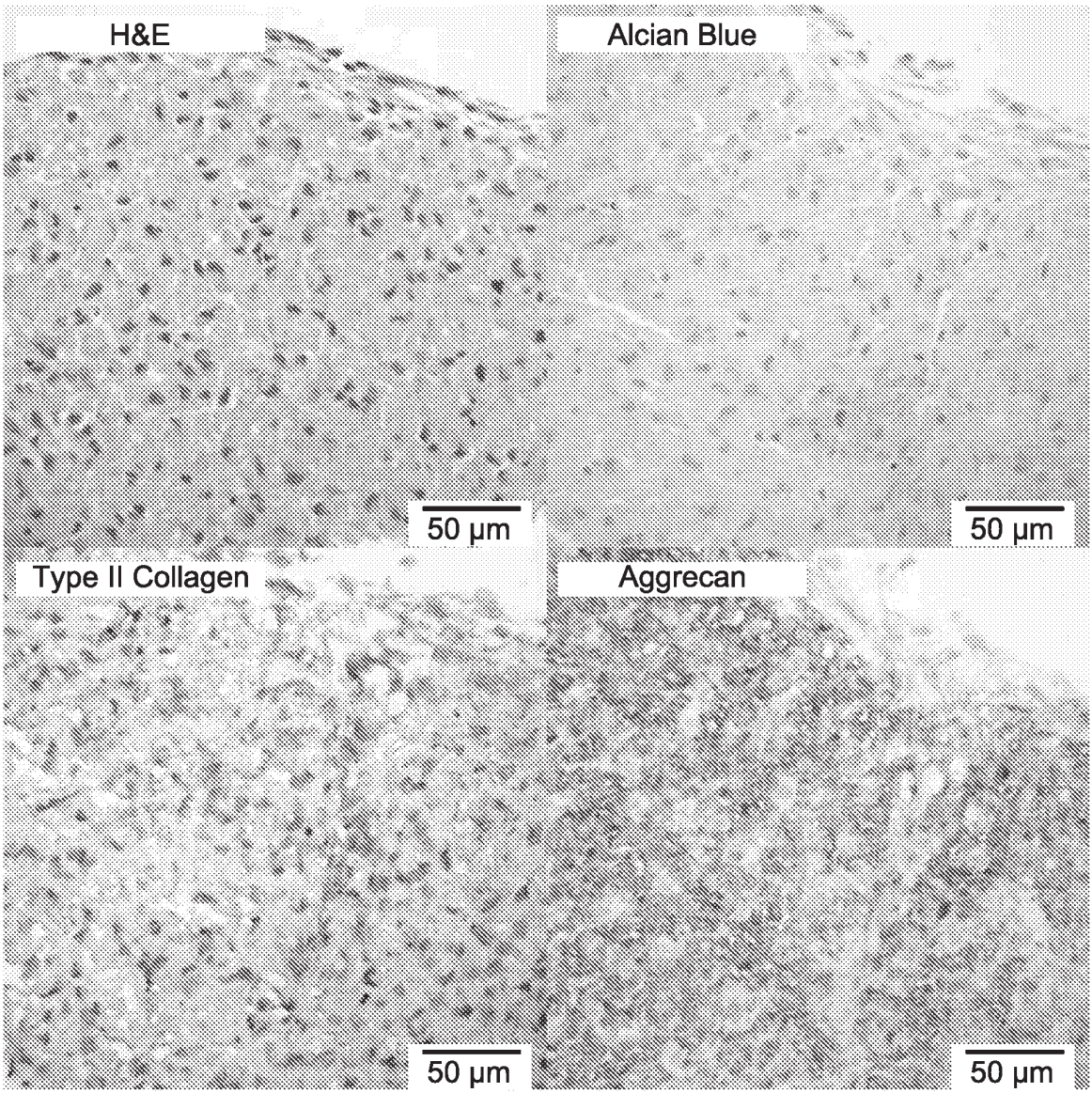

A
Alcian Blue
50 µm
B
Alcian Blue
50 µm
C
Aggrecan
50 µm
D
Q1
73.2
Q2
18.2
Q3
0.36
Q4
8.19
APC-A :: CD151
PE-A :: CD44
E
LD AF488, SSC-A subset
88.9
SSC-A
405 D-A :: LD AF488

FIG. 19


H&E
50 µm
Alcian Blue
50 µm
Type II Collagen
50 µm
Aggrecan
50 µm