FIG. 1

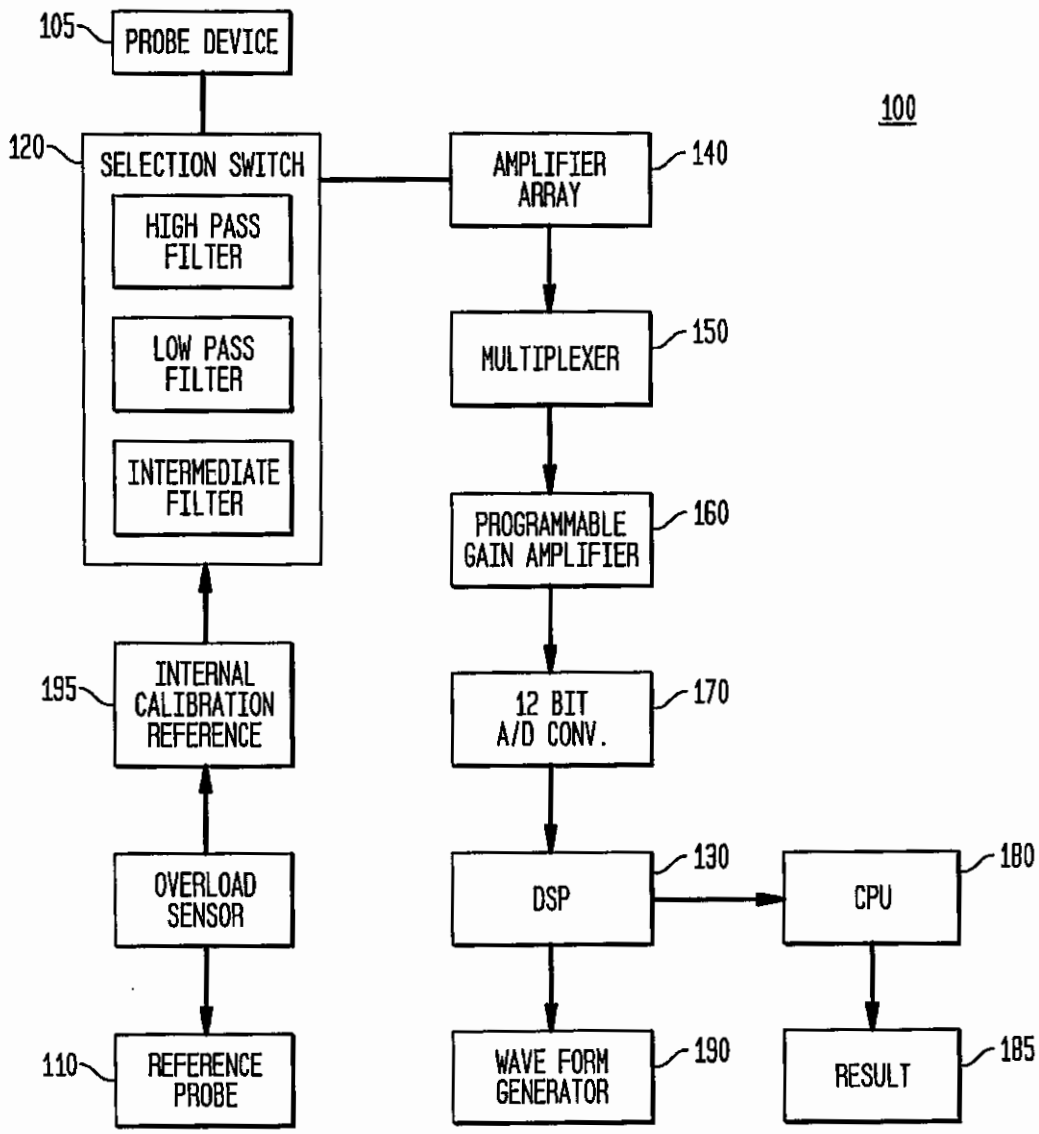

105
PROBE DEVICE
100
120
SELECTION SWITCH
HIGH PASS FILTER
LOW PASS FILTER
INTERMEDIATE FILTER
AMPLIFIER ARRAY
140
MULTIPLEXER
150
PROGRAMMABLE GAIN AMPLIFIER
160
12 BIT A/D CONV.
170
DSP
130
CPU
180
195
INTERNAL CALIBRATION REFERENCE
OVERLOAD SENSOR
110
REFERENCE PROBE
WAVE FORM GENERATOR
190
RESULT
185

FIG. 2

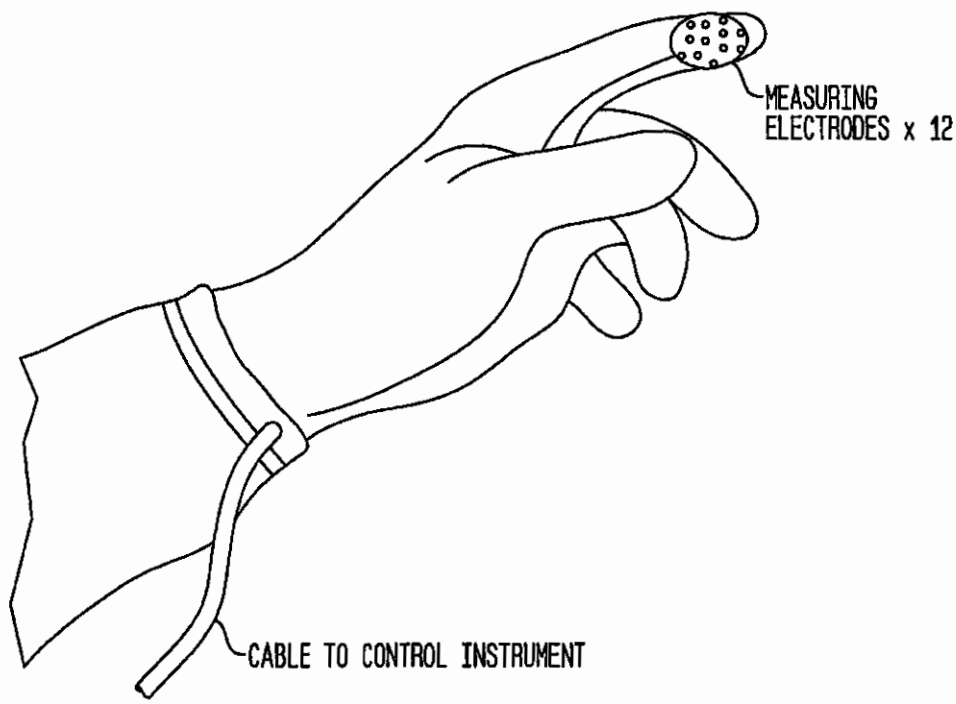


FIG. 3

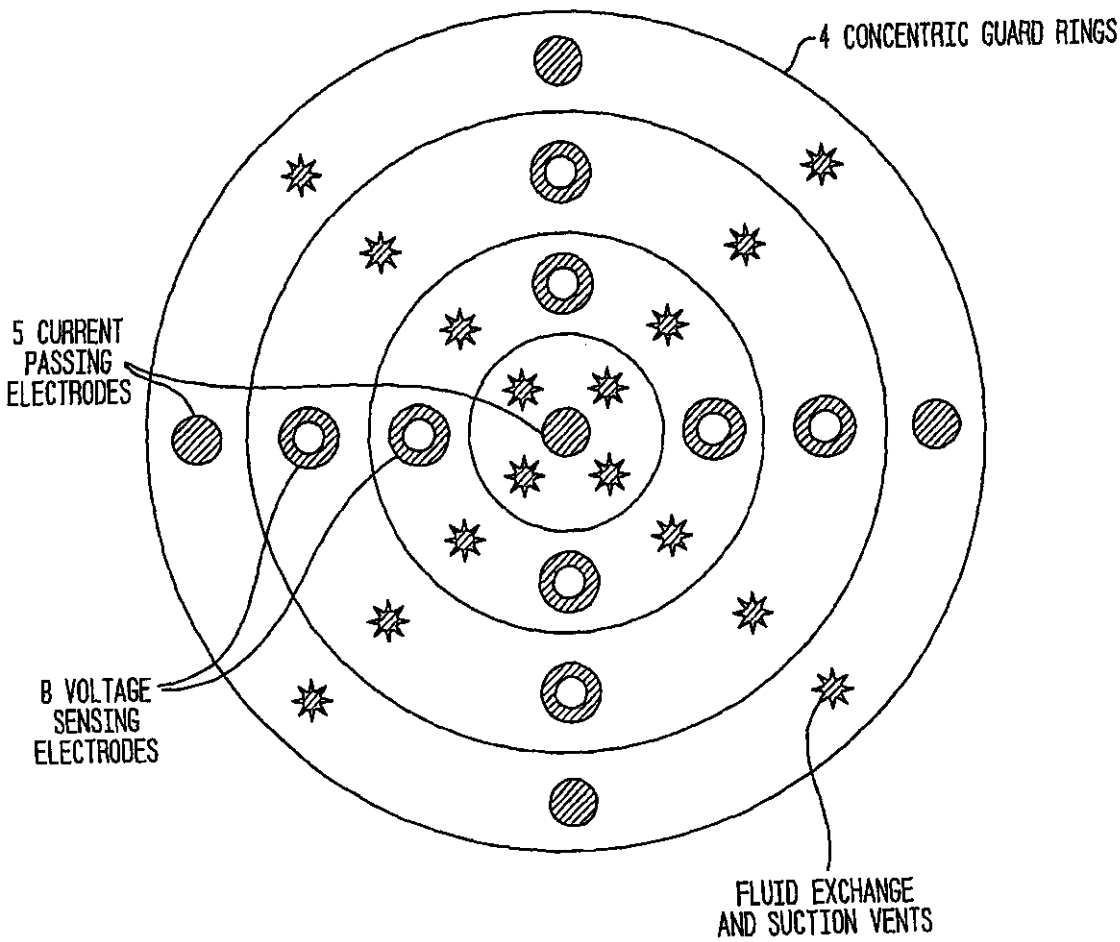

4 CONCENTRIC GUARD RINGS
5 CURRENT PASSING ELECTRODES
8 VOLTAGE SENSING ELECTRODES
FLUID EXCHANGE AND SUCTION VENTS

FIG. 4A

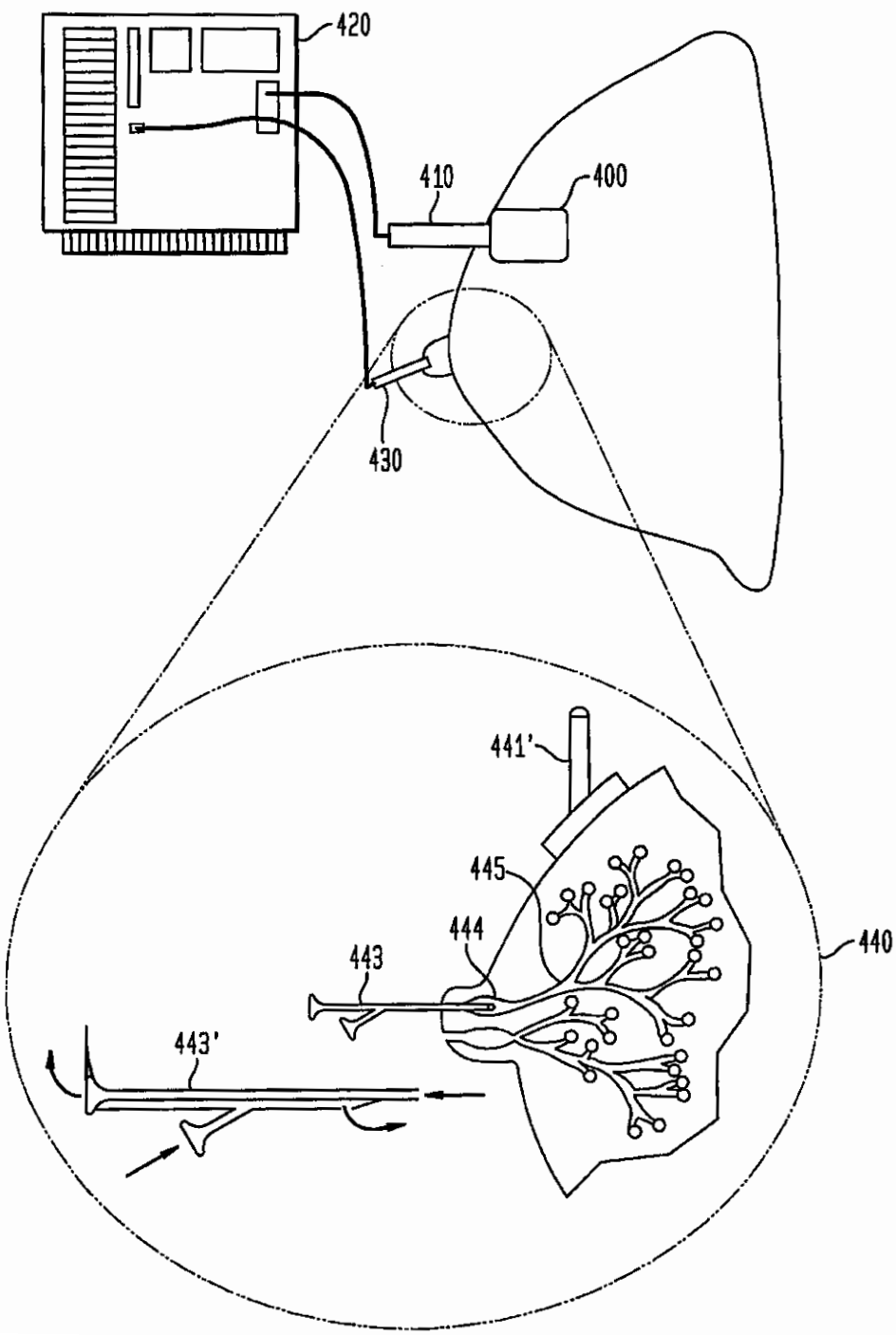


FIG. 4B

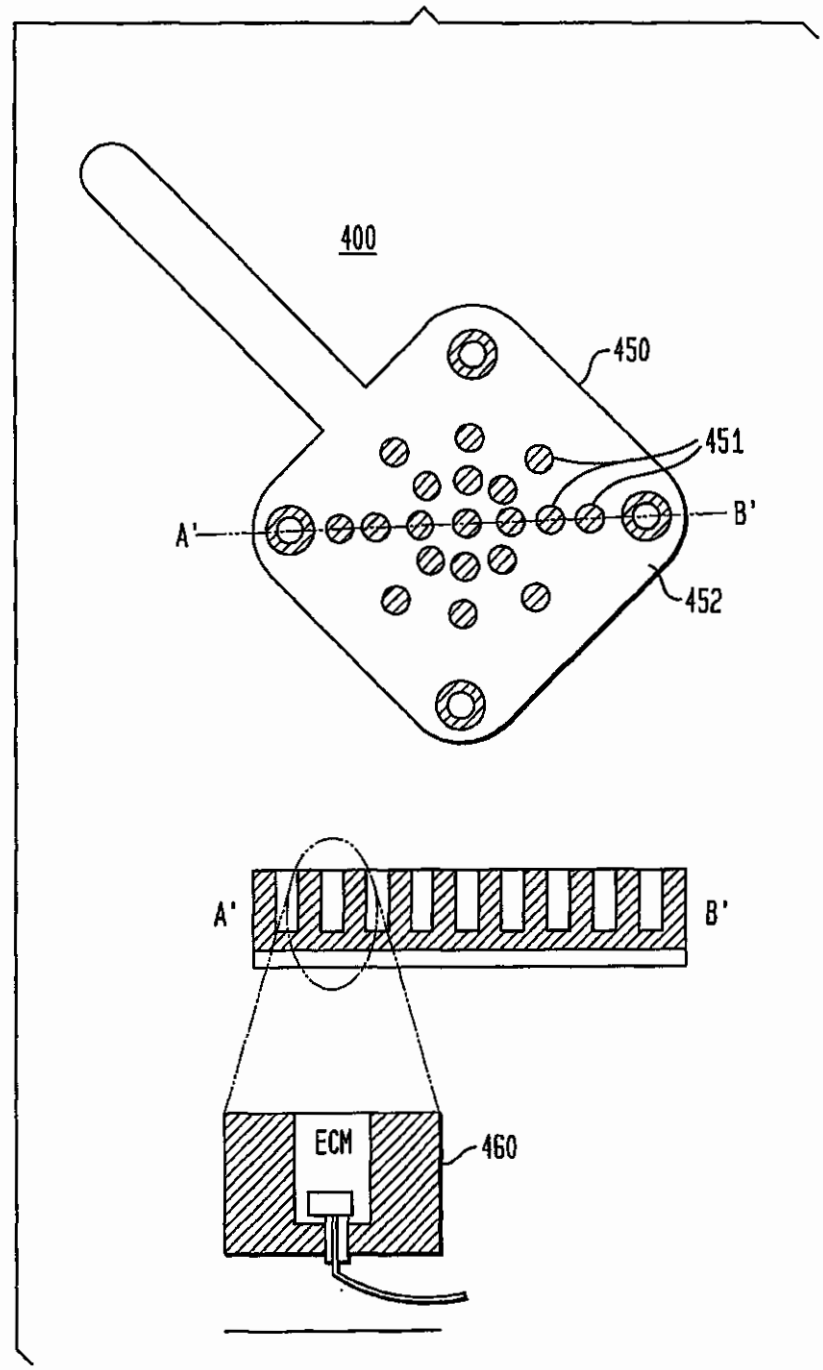


FIG. 5A

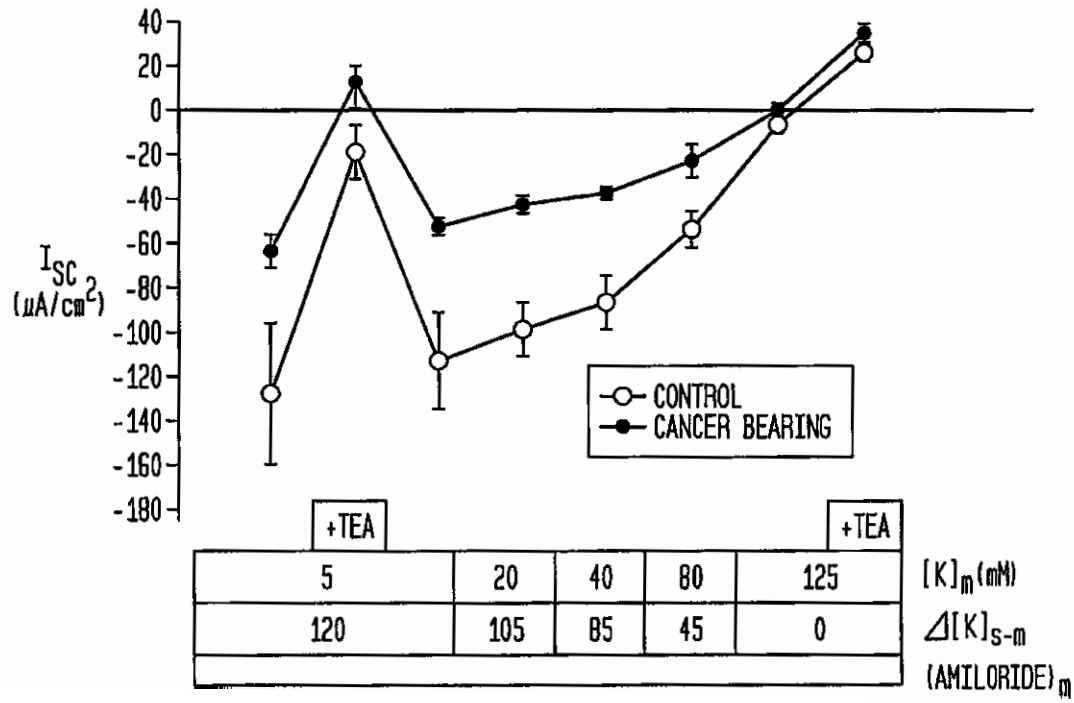

40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
I_{SC} ($\mu A/cm^2$)
CONTROL
CANCER BEARING
+TEA
+TEA
5
20
40
80
125
$[K]_m$(mM)
120
105
85
45
0
$\Delta[K]_{s-m}$
(AMILORIDE)$_m$

FIG. 5B

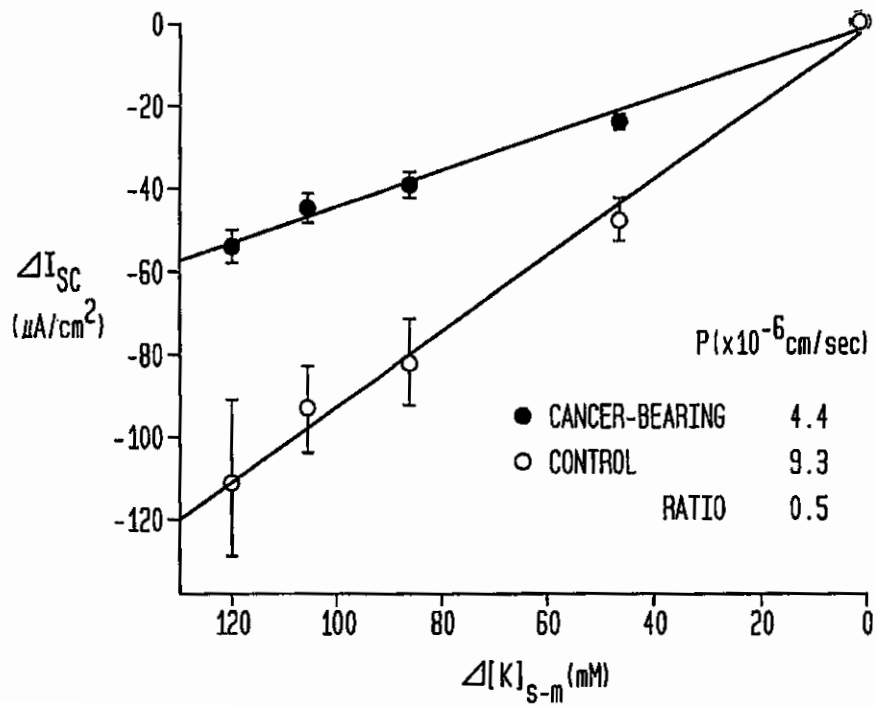

0
-20
-40
-60
-80
-100
-120
ΔI_SC (μA/cm²)
P(x10⁻⁶cm/sec)
CANCER-BEARING 4.4
CONTROL 9.3
RATIO 0.5
120
100
80
60
40
20
0
Δ[K]_s-m (mM)

FIG. 6

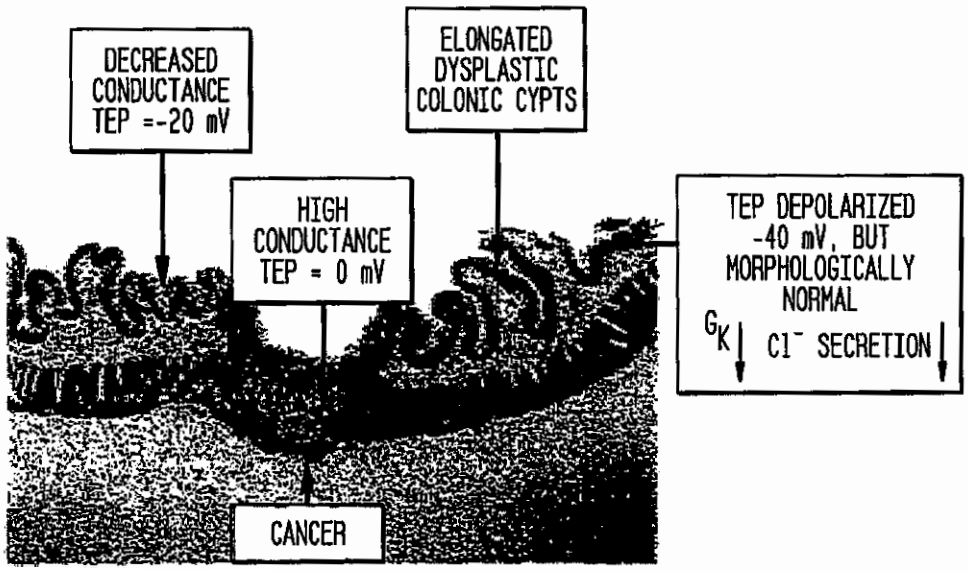

DECREASED CONDUCTANCE TEP =-20 mV
ELONGATED DYSPLASTIC COLONIC CYPTS
HIGH CONDUCTANCE TEP = 0 mV
TEP DEPOLARIZED -40 mV, BUT MORPHOLOGICALLY NORMAL
G_K ↓ Cl^- SECRETION ↓
CANCER

FIG. 7

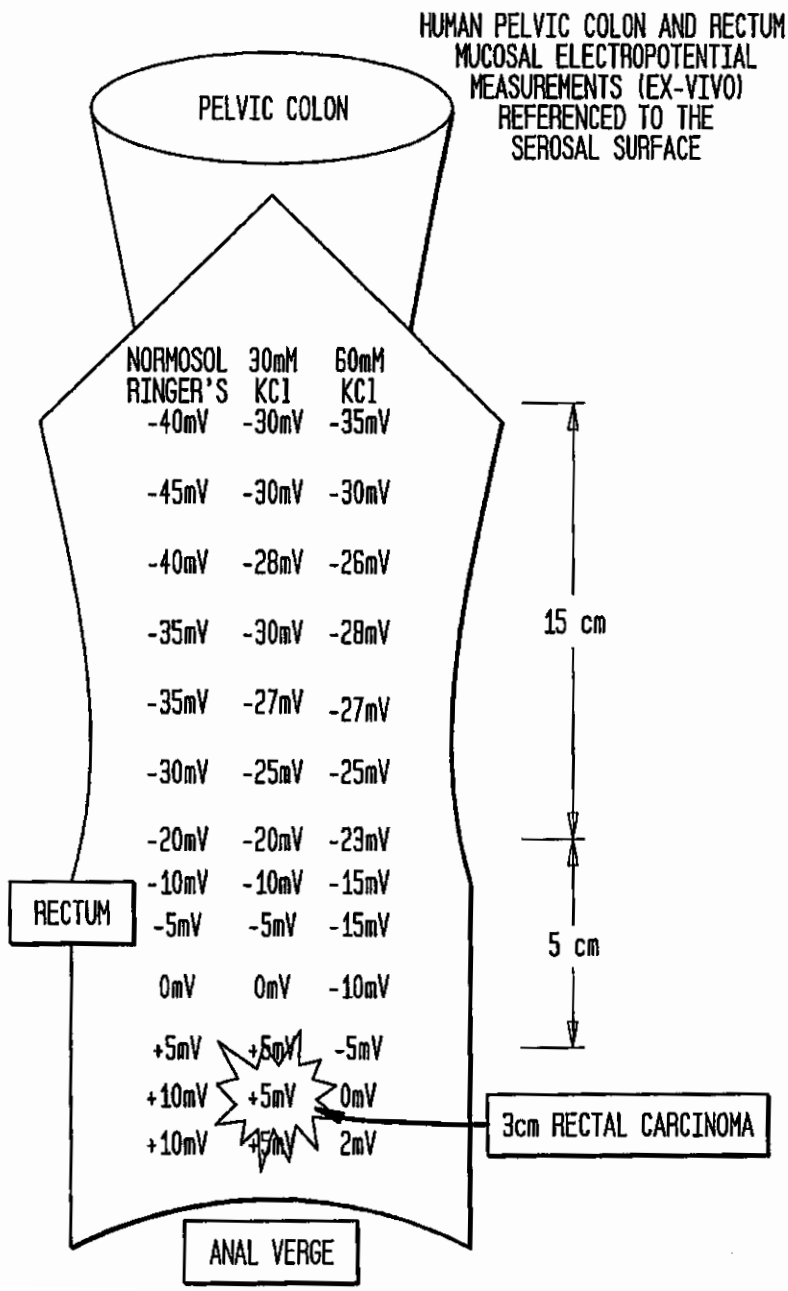

HUMAN PELVIC COLON AND RECTUM:
MUCOSAL ELECTROPOTENTIAL
MEASUREMENTS (EX-VIVO)
REFERENCED TO THE
SEROSAL SURFACE
PELVIC COLON
NORMOSOL RINGER'S
30mM KCl
60mM KCl
-40mV -30mV -35mV
-45mV -30mV -30mV
-40mV -28mV -26mV
-35mV -30mV -28mV
-35mV -27mV -27mV
-30mV -25mV -25mV
-20mV -20mV -23mV
-10mV -10mV -15mV
-5mV -5mV -15mV
0mV 0mV -10mV
+5mV +5mV -5mV
+10mV +5mV 0mV
+10mV +5mV 2mV
15 cm
5 cm
RECTUM
3cm RECTAL CARCINOMA
ANAL VERGE

FIG. 8

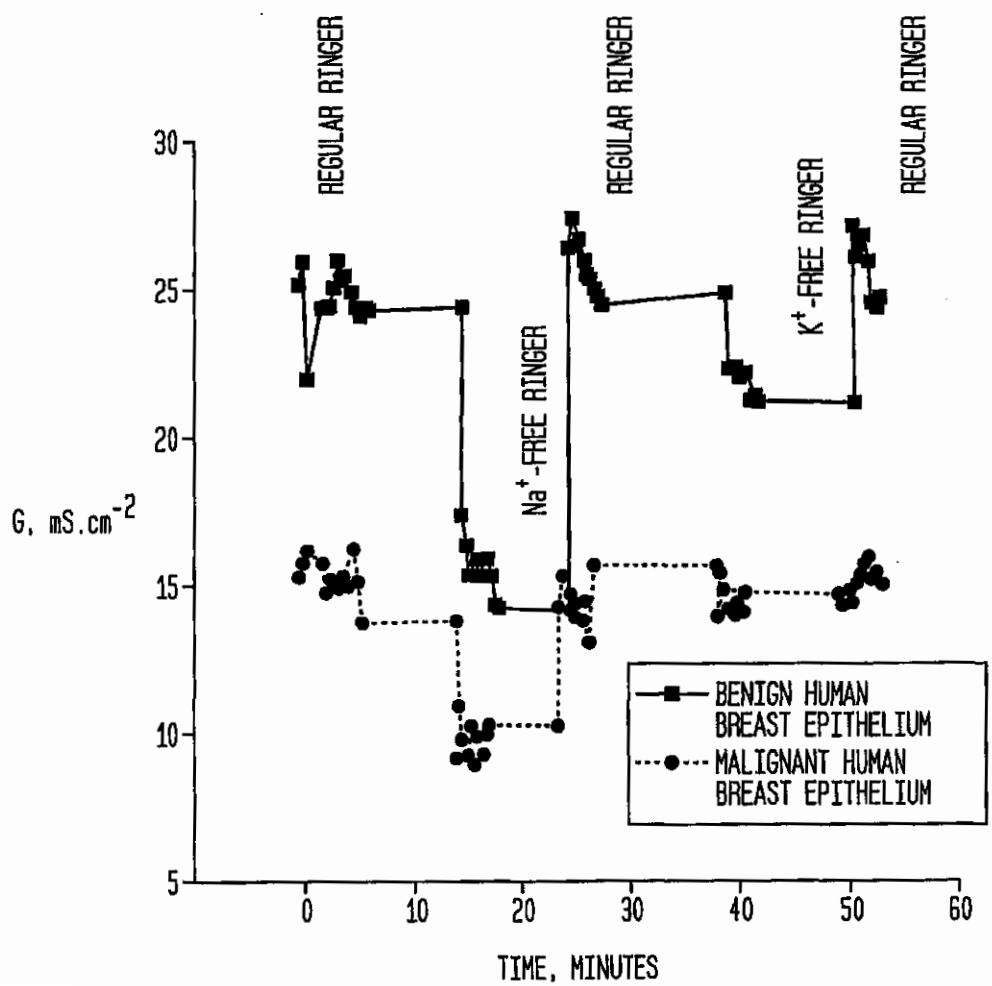

REGULAR RINGER
REGULAR RINGER
REGULAR RINGER
Na+-FREE RINGER
K+-FREE RINGER
G, mS.cm-2
30
25
20
15
10
5
0
10
20
30
40
50
60
TIME, MINUTES
BENIGN HUMAN BREAST EPITHELIUM
MALIGNANT HUMAN BREAST EPITHELIUM

FIG. 9

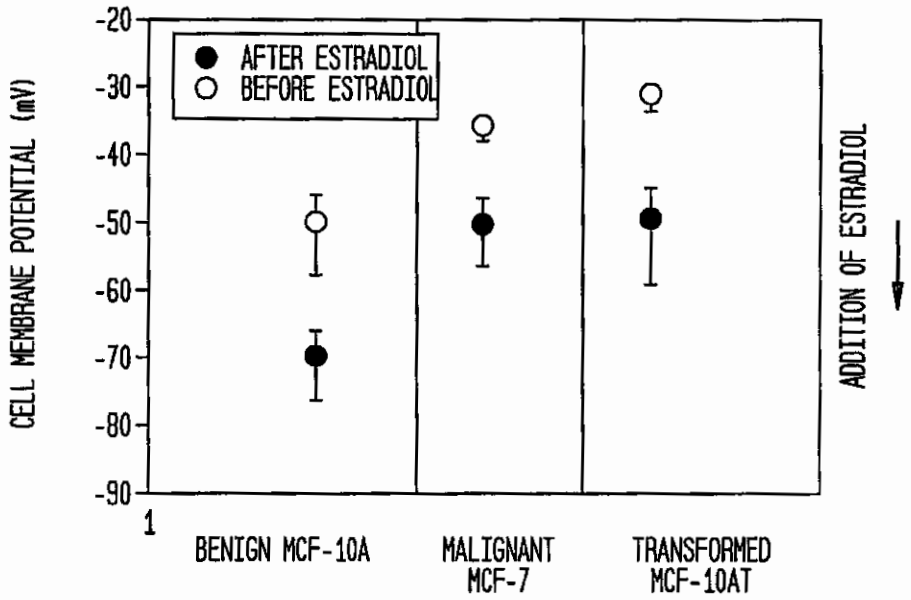

-20
-30
-40
-50
-60
-70
-80
-90
AFTER ESTRADIOL
BEFORE ESTRADIOL
CELL MEMBRANE POTENTIAL (mV)
ADDITION OF ESTRADIOL
1
BENIGN MCF-10A
MALIGNANT MCF-7
TRANSFORMED MCF-10AT

FIG. 10

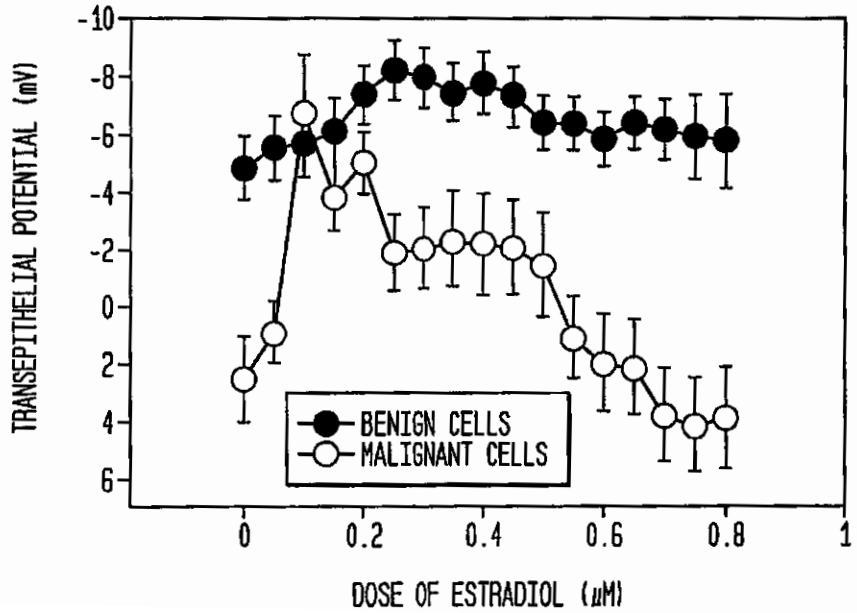

-10
-8
-6
-4
-2
0
2
4
6
TRANSEPITHELIAL POTENTIAL (mV)
BENIGN CELLS
MALIGNANT CELLS
0
0.2
0.4
0.6
0.8
1
DOSE OF ESTRADIOL (μM)

FIG. 11

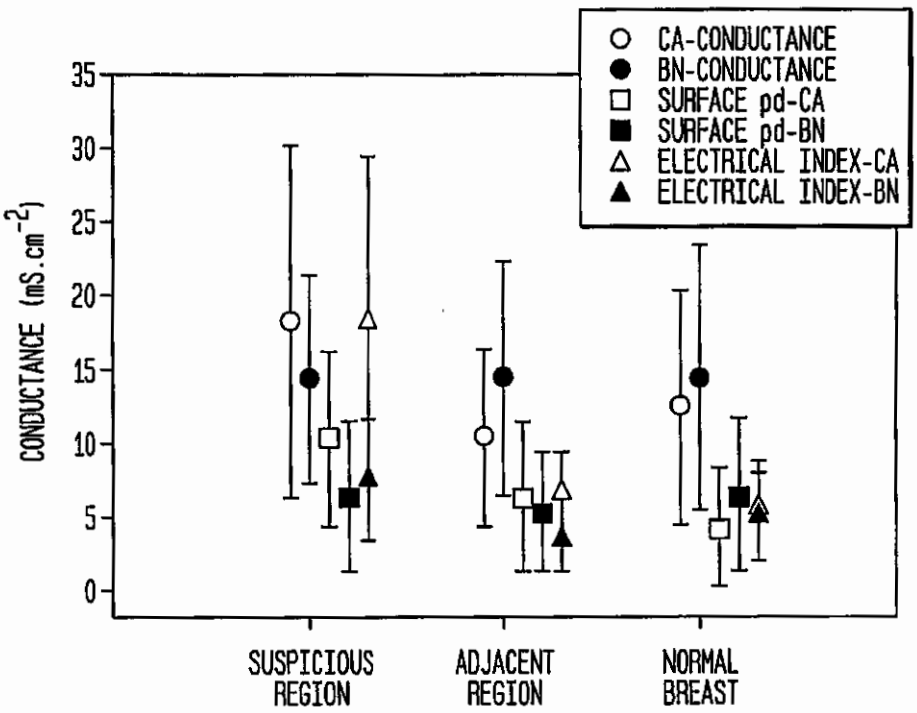

CA-CONDUCTANCE
BN-CONDUCTANCE
SURFACE pd-CA
SURFACE pd-BN
ELECTRICAL INDEX-CA
ELECTRICAL INDEX-BN
CONDUCTANCE (mS.cm^{-2})
35
30
25
20
15
10
5
0
SUSPICIOUS REGION
ADJACENT REGION
NORMAL BREAST

FIG. 12

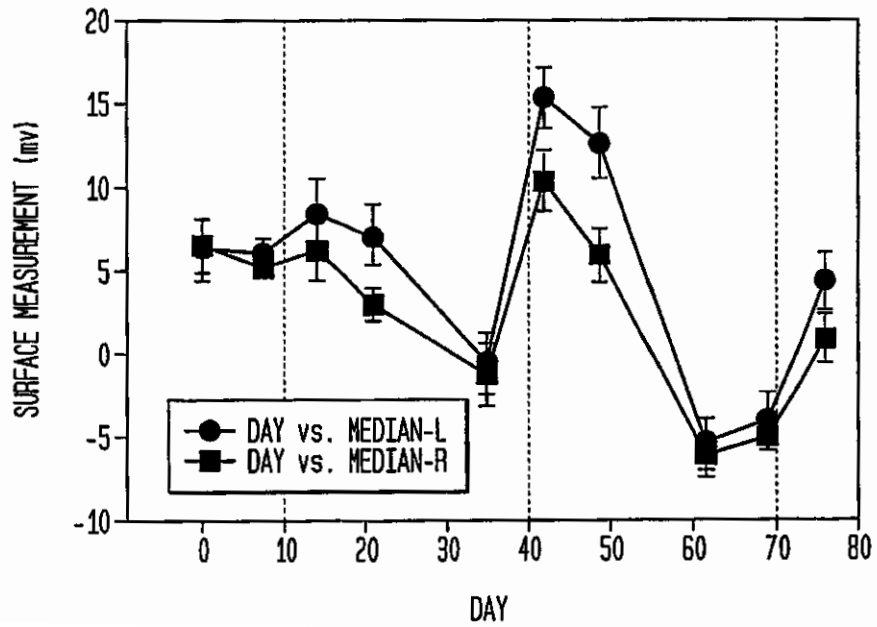

SURFACE MEASUREMENT (mv)
20
15
10
5
0
-5
-10
DAY vs. MEDIAN-L
DAY vs. MEDIAN-R
0
10
20
30
40
50
60
70
80
DAY

FIG. 13

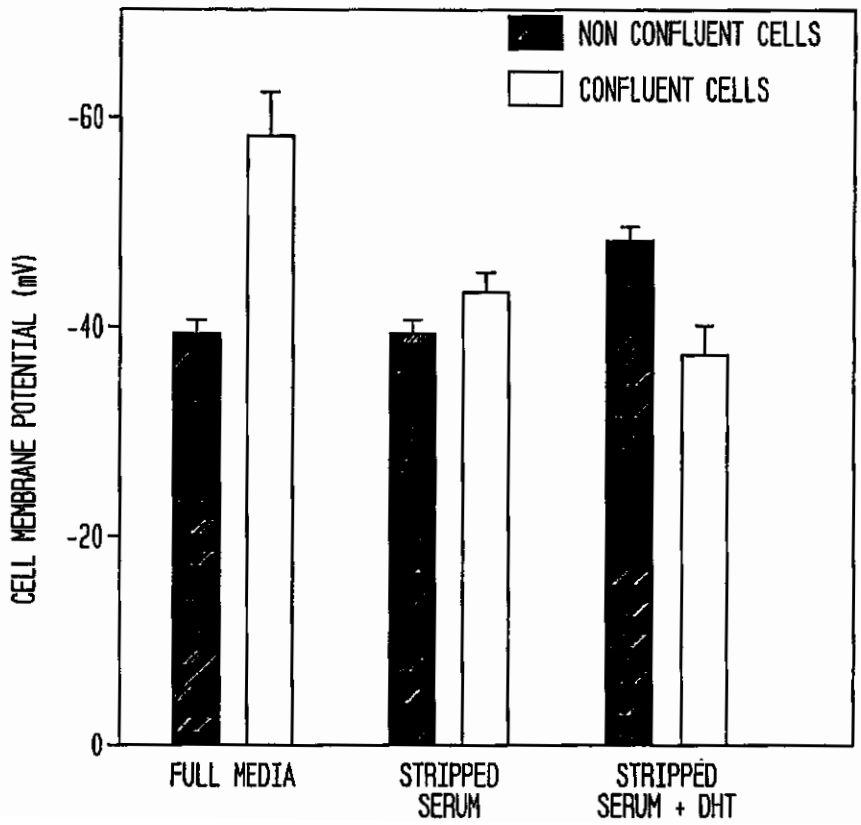

NON CONFLUENT CELLS
CONFLUENT CELLS
CELL MEMBRANE POTENTIAL (mV)
-60
-40
-20
0
FULL MEDIA
STRIPPED SERUM
STRIPPED SERUM + DHT

FIG. 14

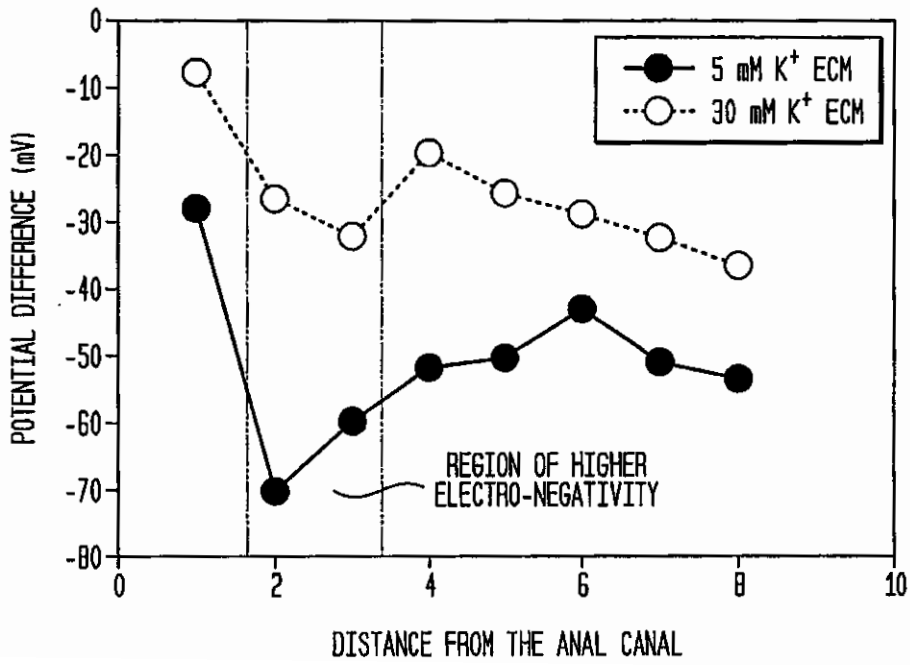
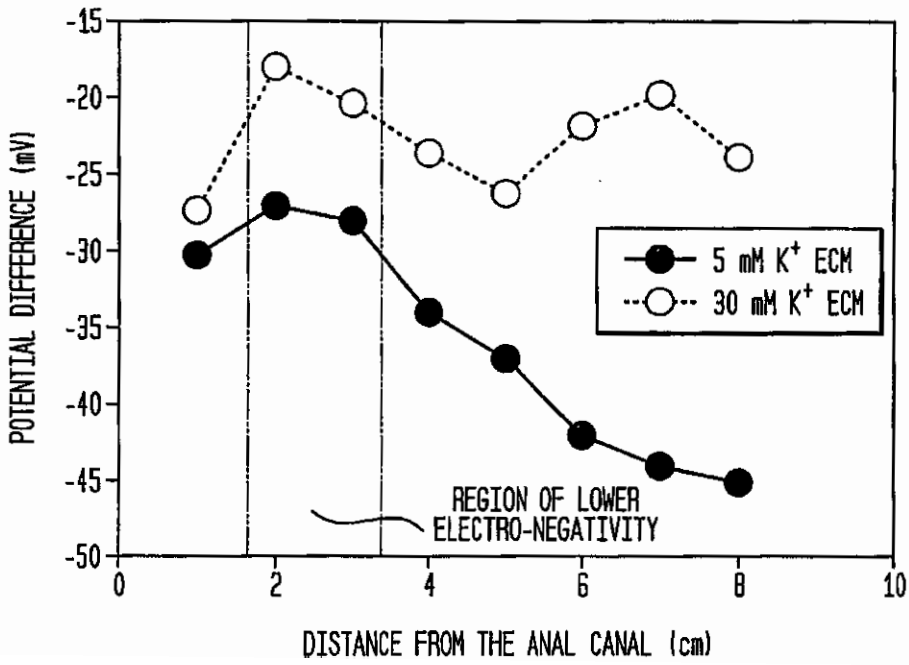

0
-10
-20
-30
-40
-50
-60
-70
-80
0
2
4
6
8
10
POTENTIAL DIFFERENCE (mV)
DISTANCE FROM THE ANAL CANAL
5 mM K+ ECM
30 mM K+ ECM
REGION OF HIGHER
ELECTRO-NEGATIVITY

FIG. 15


-15
-20
-25
-30
-35
-40
-45
-50
POTENTIAL DIFFERENCE (mV)
0
2
4
6
8
10
DISTANCE FROM THE ANAL CANAL (cm)
5 mM K+ ECM
30 mM K+ ECM
REGION OF LOWER
ELECTRO-NEGATIVITY