FIG. 1

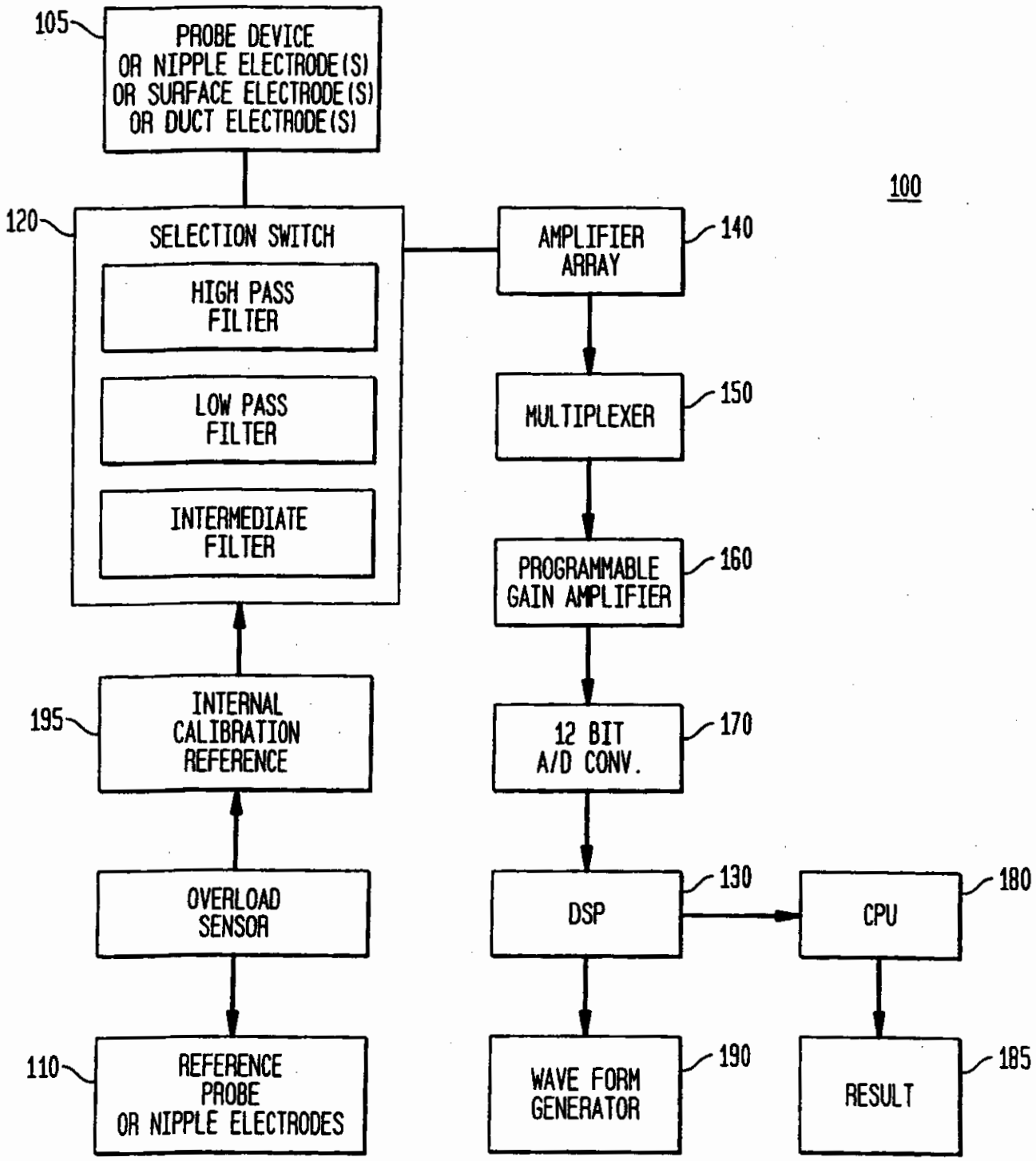

105
PROBE DEVICE
OR NIPPLE ELECTRODE(S)
OR SURFACE ELECTRODE(S)
OR DUCT ELECTRODE(S)
100
120
SELECTION SWITCH
HIGH PASS FILTER
LOW PASS FILTER
INTERMEDIATE FILTER
140
AMPLIFIER ARRAY
150
MULTIPLEXER
160
PROGRAMMABLE GAIN AMPLIFIER
170
12 BIT A/D CONV.
130
DSP
180
CPU
195
INTERNAL CALIBRATION REFERENCE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

FIG. 2

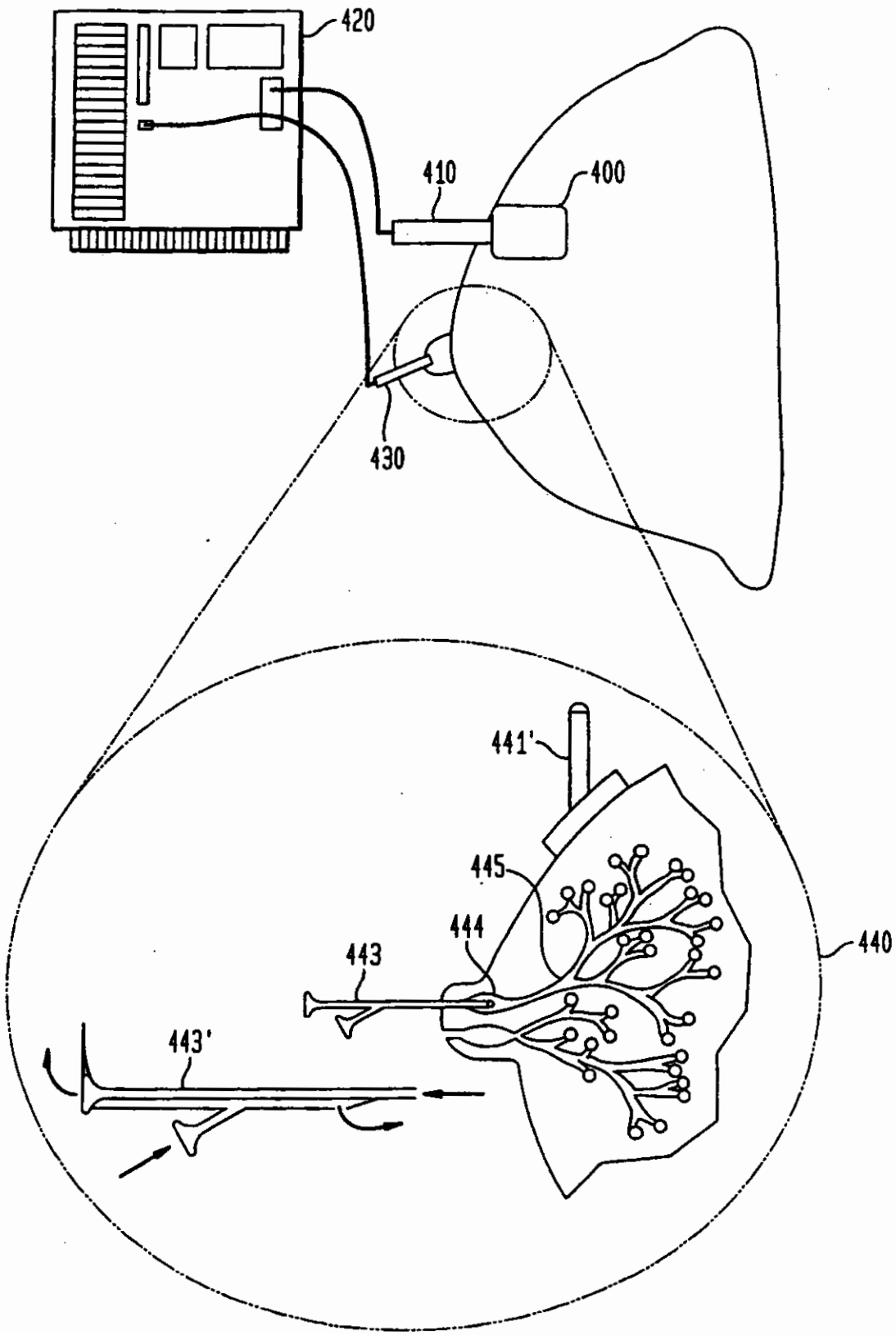


FIG. 3

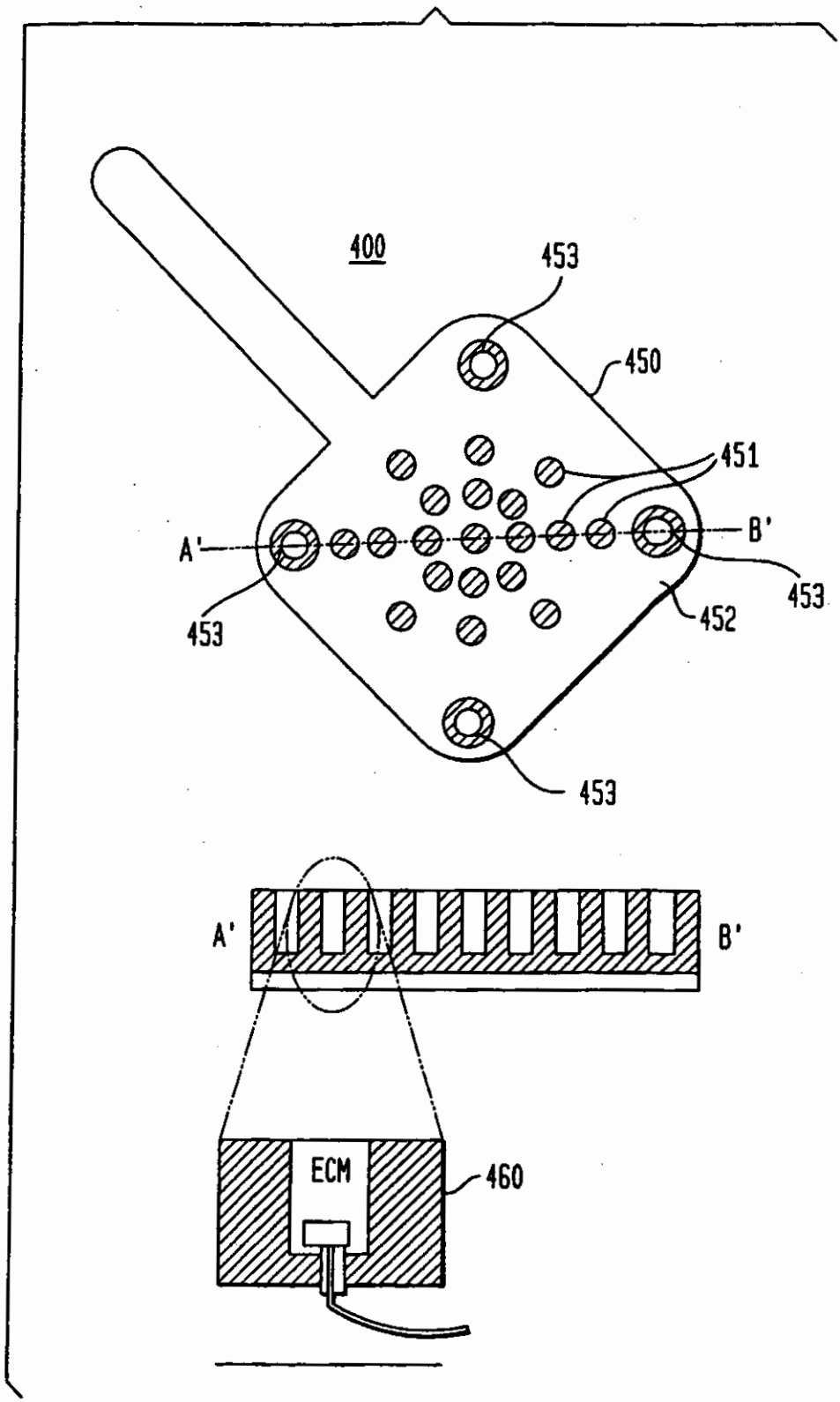


FIG. 4

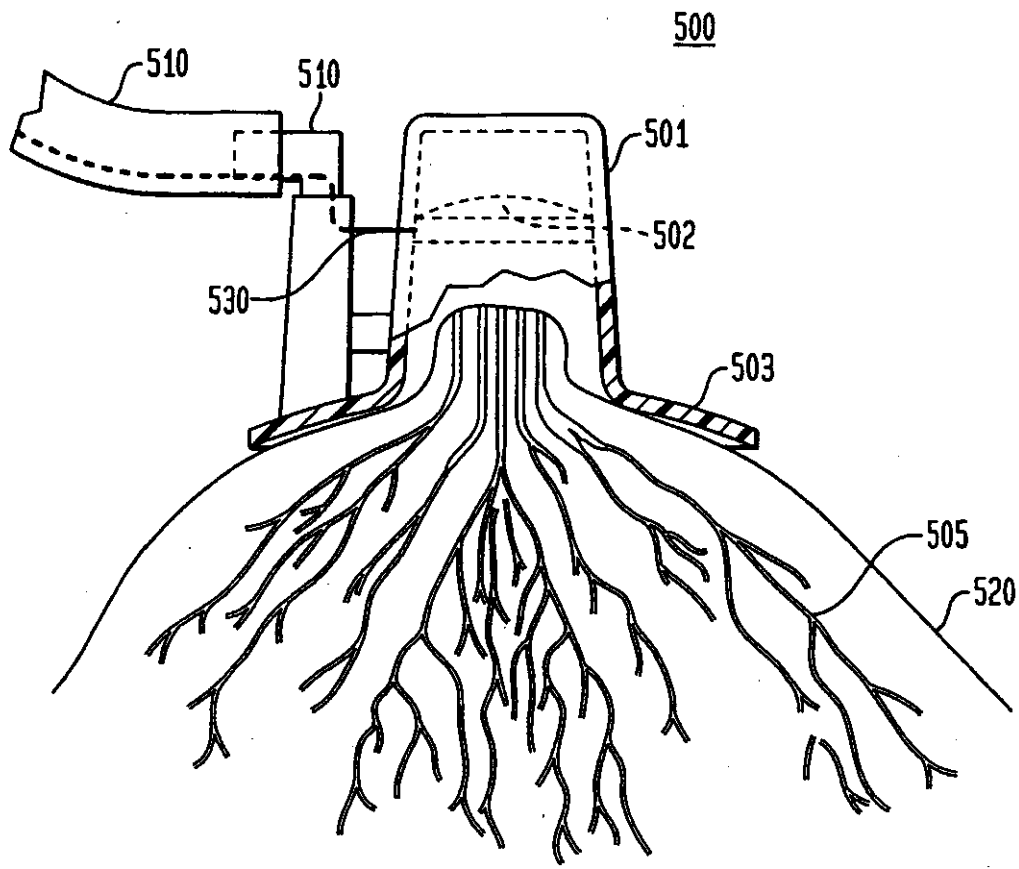


FIG. 5

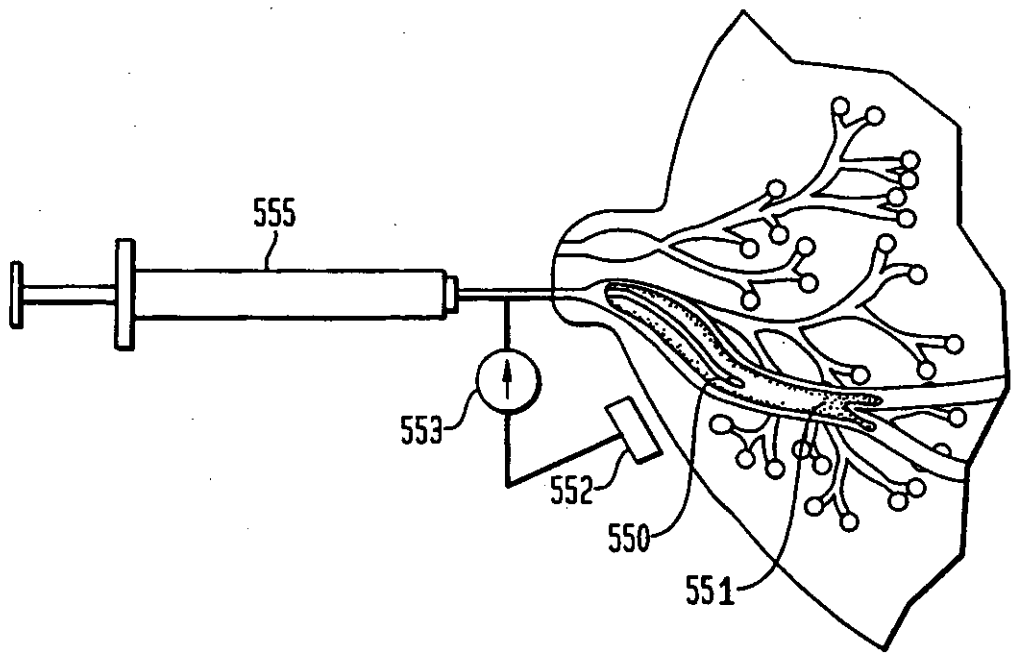


FIG. 6

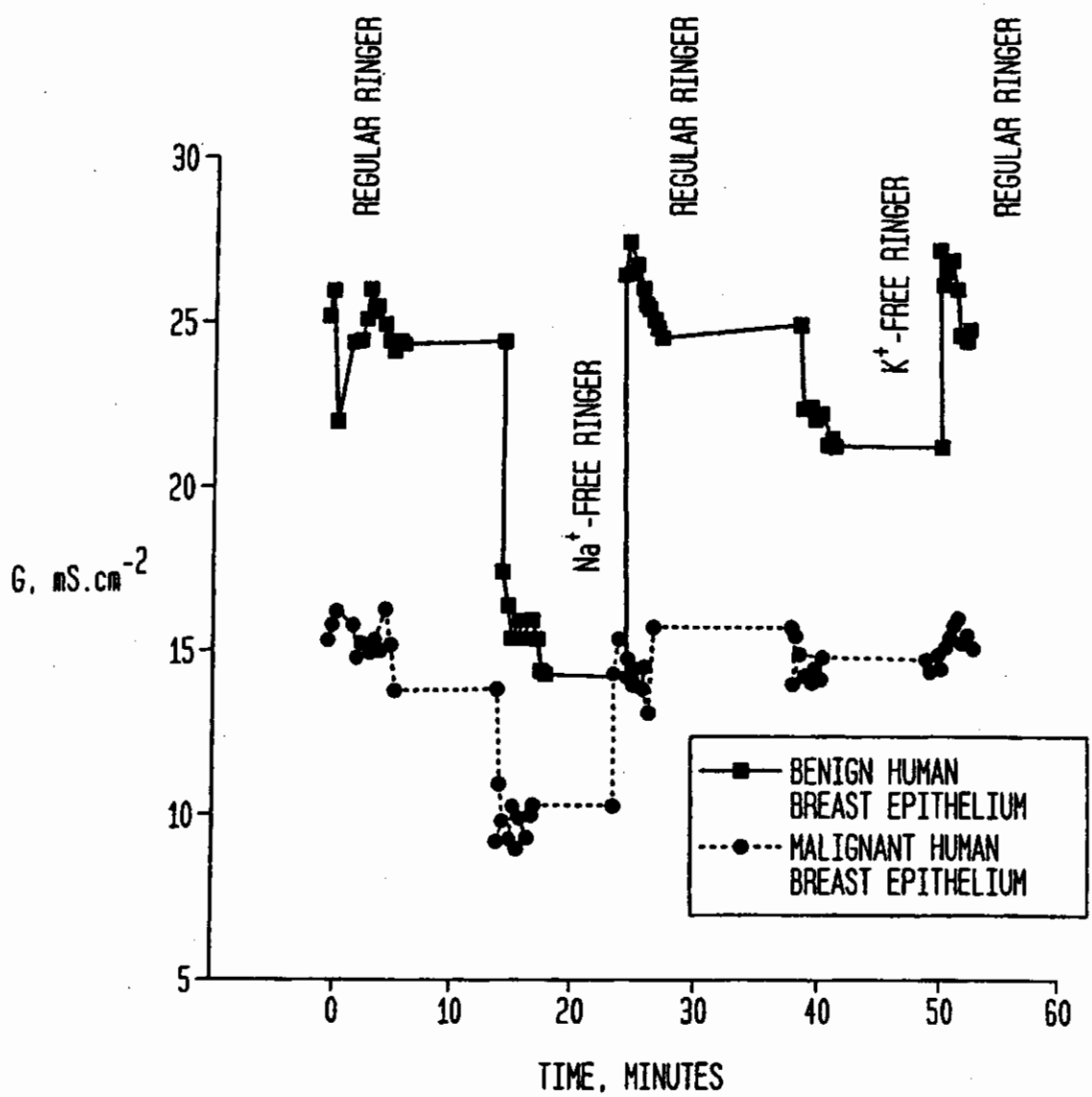

REGULAR RINGER
REGULAR RINGER
REGULAR RINGER
Na+-FREE RINGER
K+-FREE RINGER
G, mS.cm-2
30
25
20
15
10
5
0
10
20
30
40
50
60
TIME, MINUTES
BENIGN HUMAN BREAST EPITHELIUM
MALIGNANT HUMAN BREAST EPITHELIUM

FIG. 7

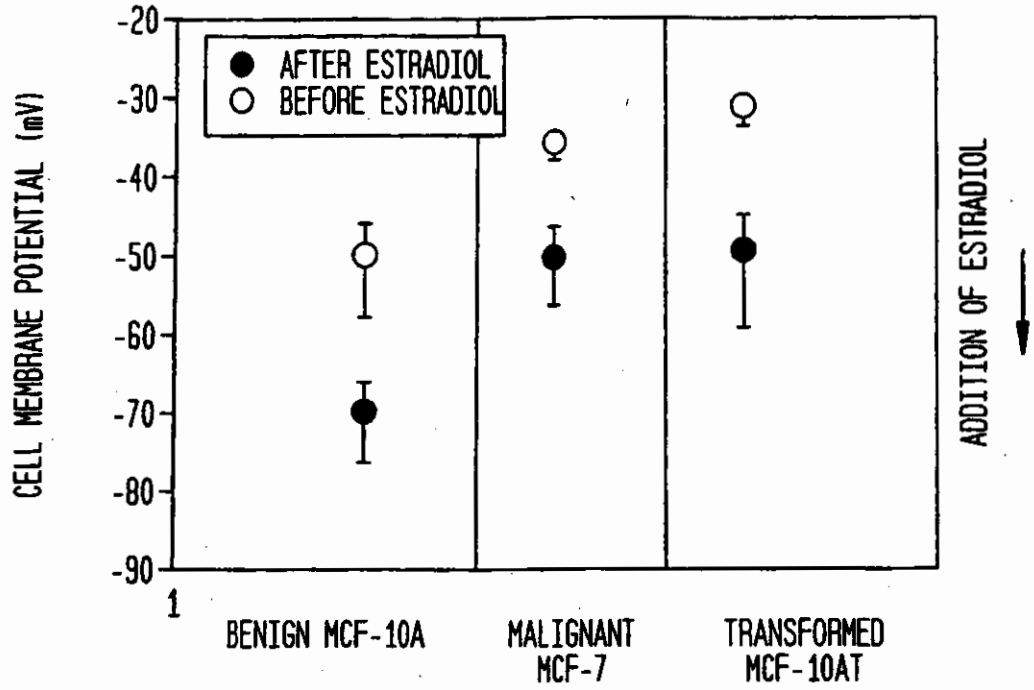

-20
-30
-40
-50
-60
-70
-80
-90
1
AFTER ESTRADIOL
BEFORE ESTRADIOL
CELL MEMBRANE POTENTIAL (mV)
ADDITION OF ESTRADIOL
BENIGN MCF-10A
MALIGNANT MCF-7
TRANSFORMED MCF-10AT

FIG. 8

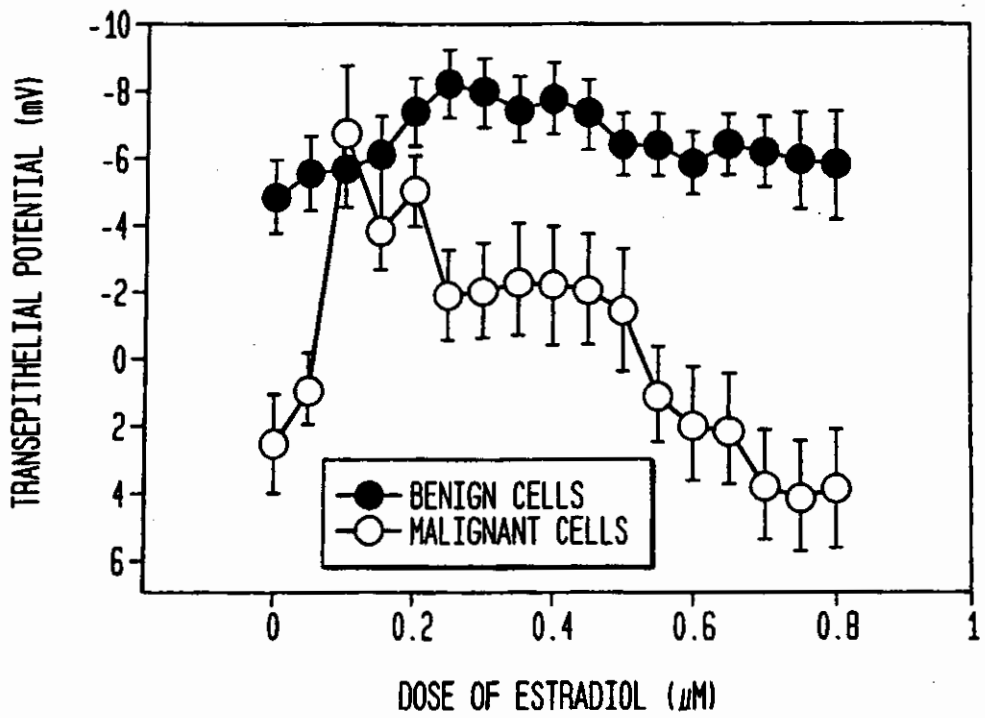

-10
-8
-6
-4
-2
0
2
4
6
0
0.2
0.4
0.6
0.8
1
BENIGN CELLS
MALIGNANT CELLS
TRANSEPITHELIAL POTENTIAL (mV)
DOSE OF ESTRADIOL (μM)

FIG. 9

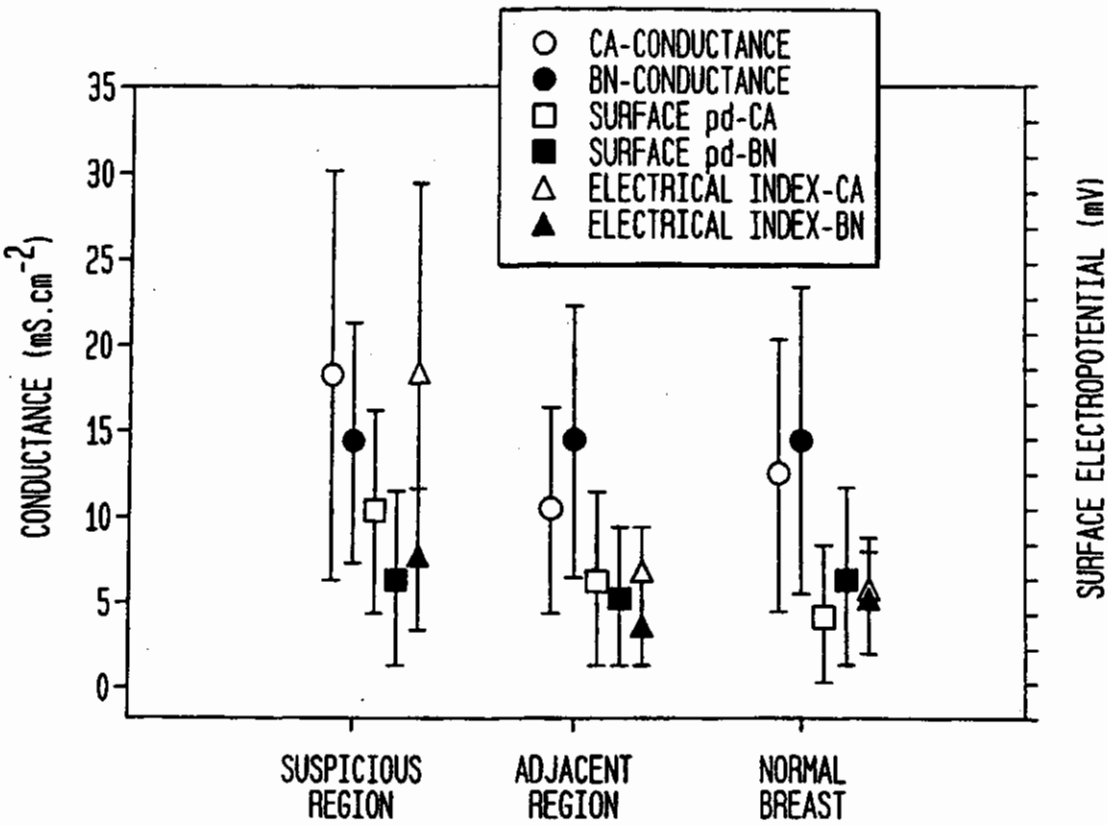

CA-CONDUCTANCE
BN-CONDUCTANCE
SURFACE pd-CA
SURFACE pd-BN
ELECTRICAL INDEX-CA
ELECTRICAL INDEX-BN
CONDUCTANCE (mS.cm^{-2})
SURFACE ELECTROPOTENTIAL (mV)
35
30
25
20
15
10
5
0
SUSPICIOUS REGION
ADJACENT REGION
NORMAL BREAST

FIG. 10

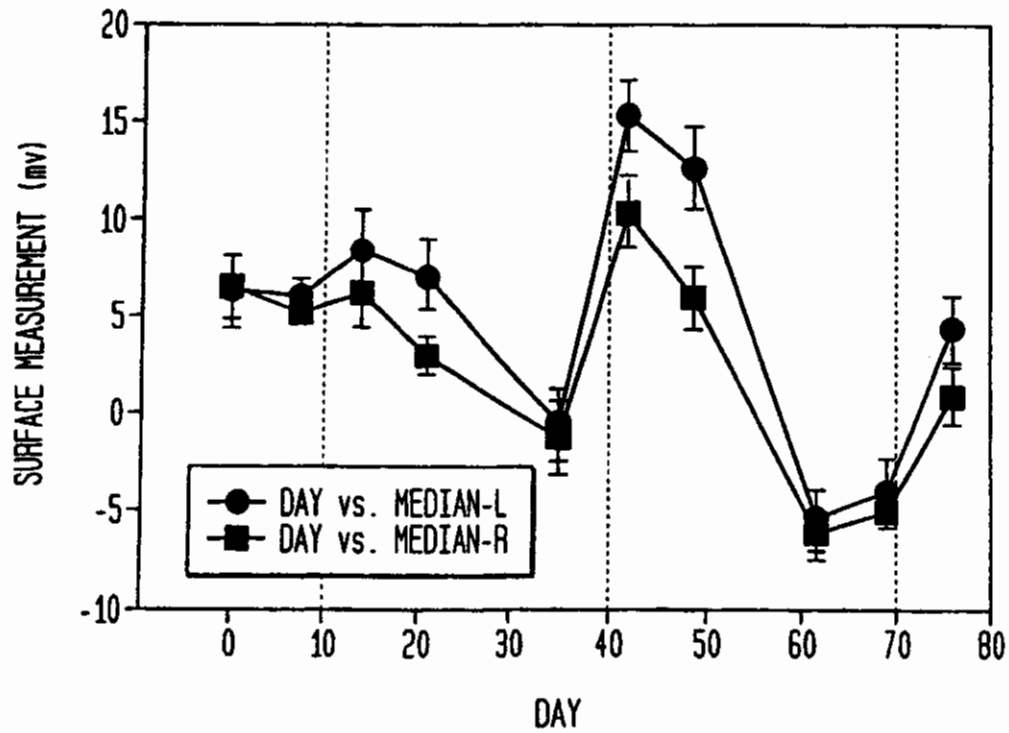

SURFACE MEASUREMENT (mv)
DAY
DAY vs. MEDIAN-L
DAY vs. MEDIAN-R
20
15
10
5
0
-5
-10
0
10
20
30
40
50
60
70
80

FIG. 11

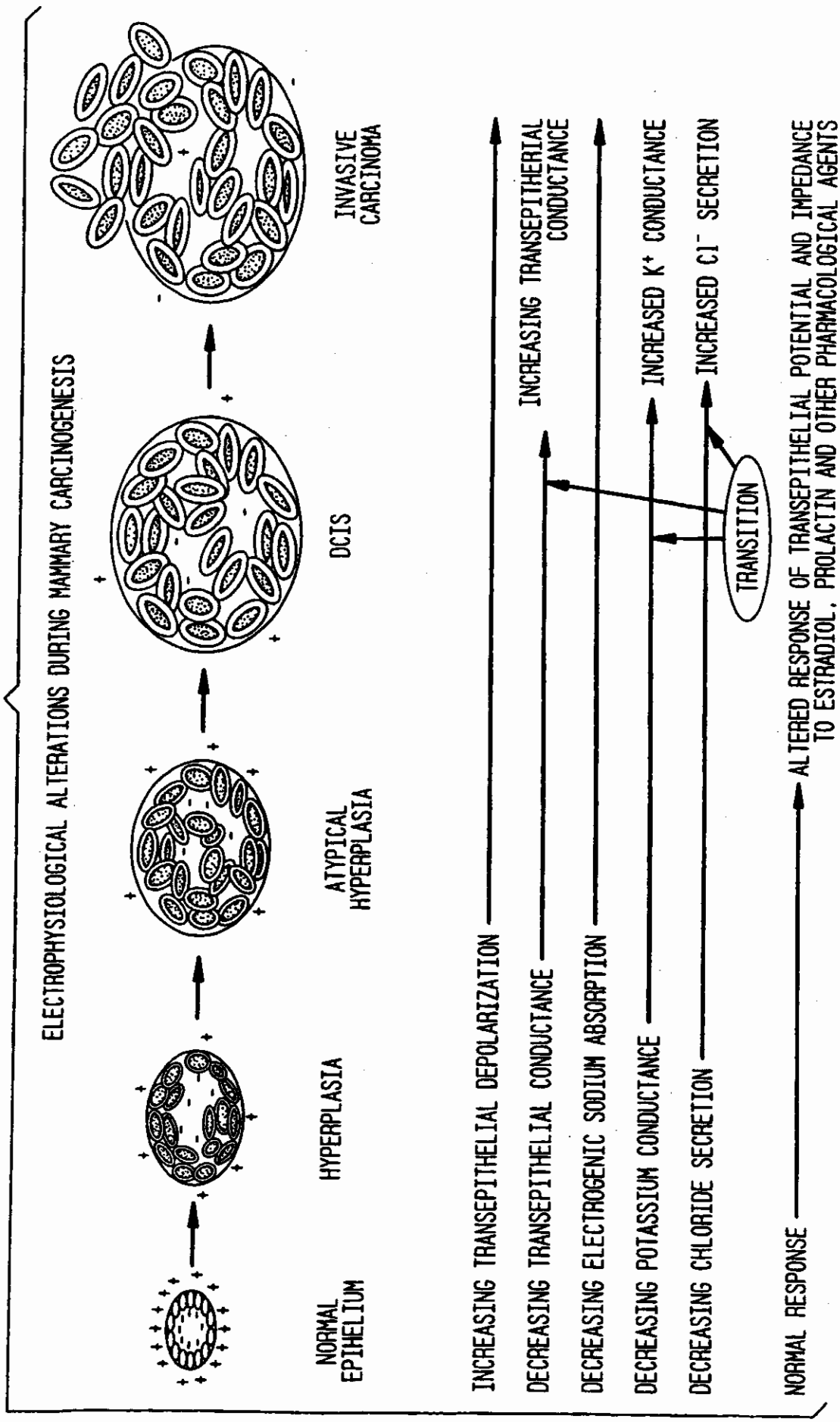

ELECTROPHYSIOLOGICAL ALTERATIONS DURING MAMMARY CARCINOGENESIS
NORMAL EPITHELIUM
HYPERPLASIA
ATYPICAL HYPERPLASIA
DCIS
INVASIVE CARCINOMA
INCREASING TRANSEPITHELIAL DEPOLARIZATION
DECREASING TRANSEPITHELIAL CONDUCTANCE
INCREASING TRANSEPITHERIAL CONDUCTANCE
DECREASING ELECTROGENIC SODIUM ABSORPTION
DECREASING POTASSIUM CONDUCTANCE
INCREASED K+ CONDUCTANCE
DECREASING CHLORIDE SECRETION
INCREASED Cl- SECRETION
TRANSITION
NORMAL RESPONSE
ALTERED RESPONSE OF TRANSEPITHELIAL POTENTIAL AND IMPEDANCE TO ESTRADIOL, PROLACTIN AND OTHER PHARMACOLOGICAL AGENTS

FIG. 12

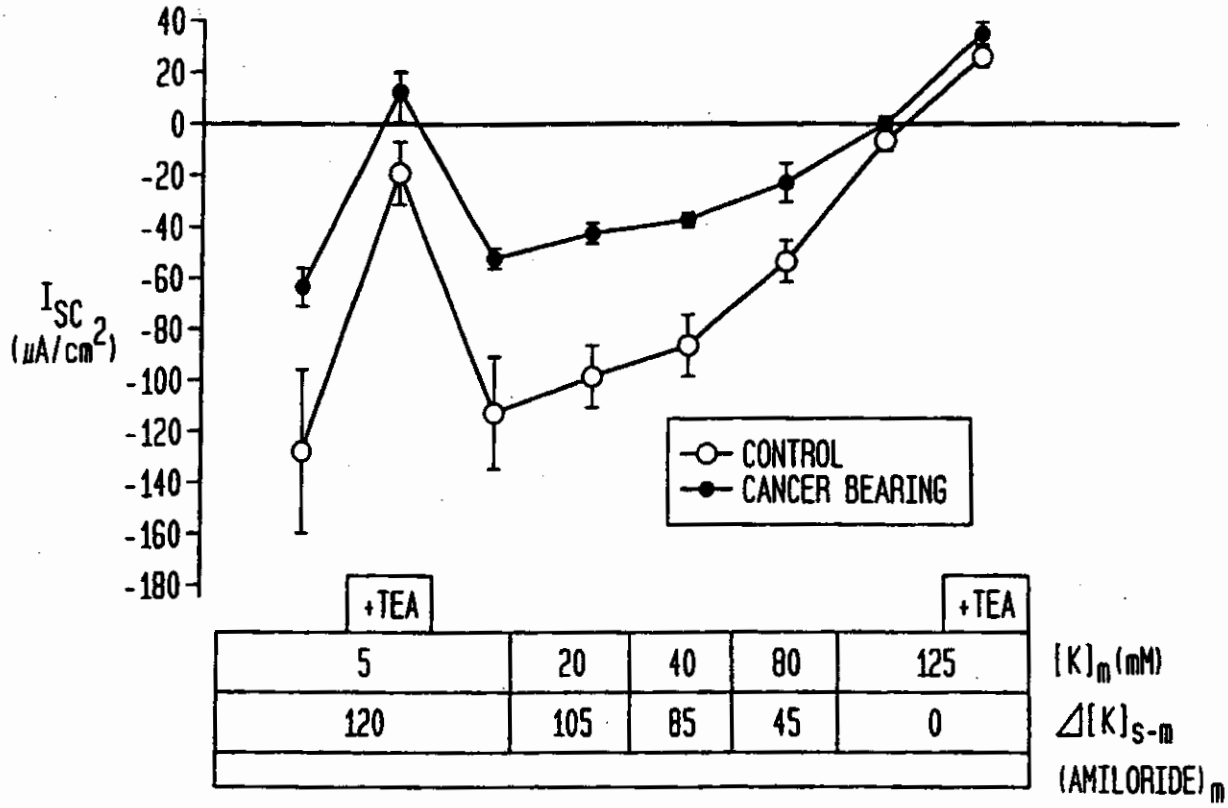
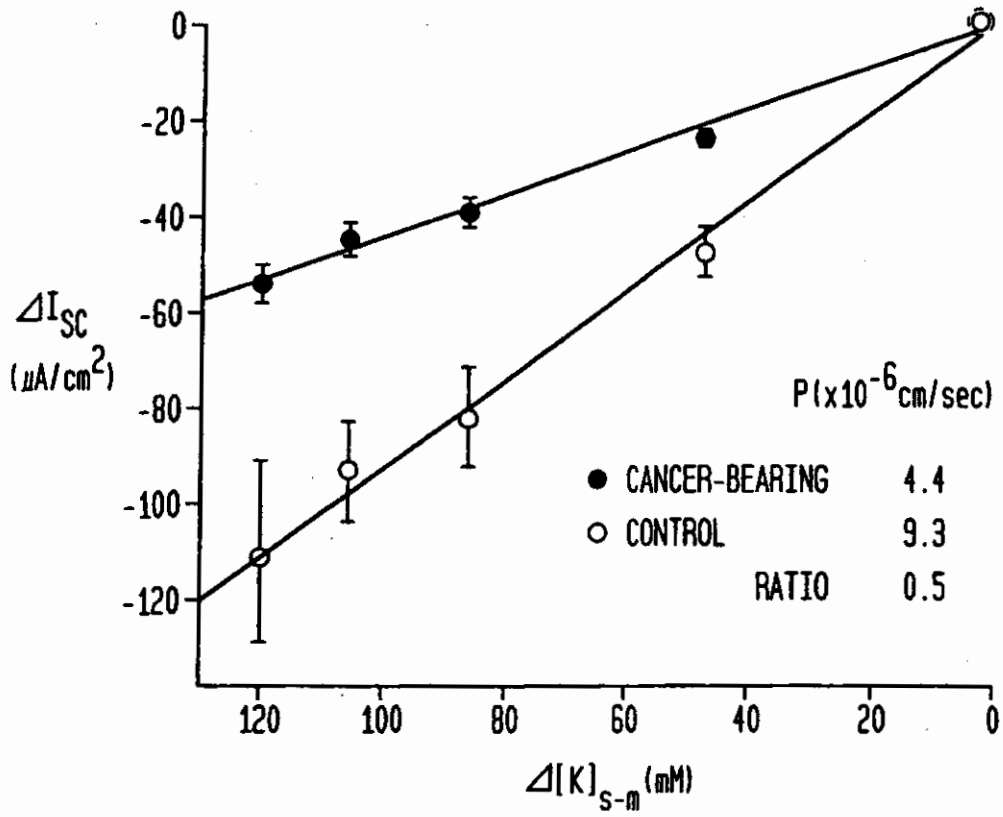

40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
I_{SC} ($\mu A/cm^2$)
CONTROL
CANCER BEARING
+TEA
+TEA
5
20
40
80
125
$[K]_m$ (mM)
120
105
85
45
0
$\Delta[K]_{s-m}$
(AMILORIDE)$_m$

FIG. 13


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