FIG. 1 A

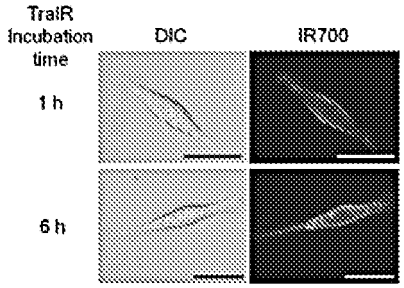


FIG. 1 B

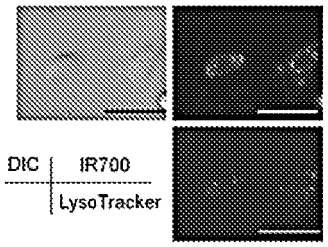


FIG. 1 C

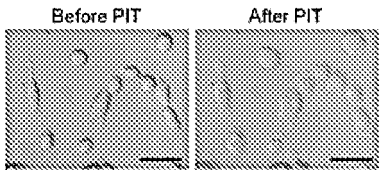


FIG. 1 D

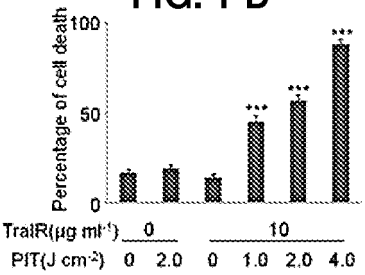


FIG. 1 E

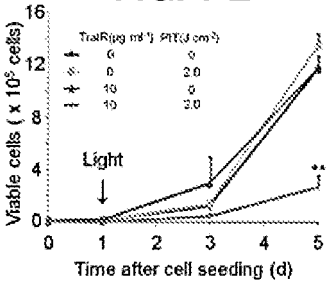


FIG. 1 F

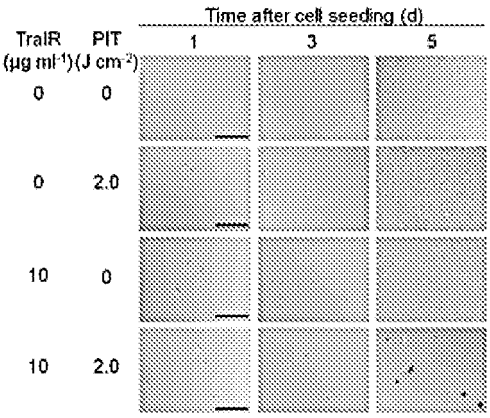


FIG. 1 G

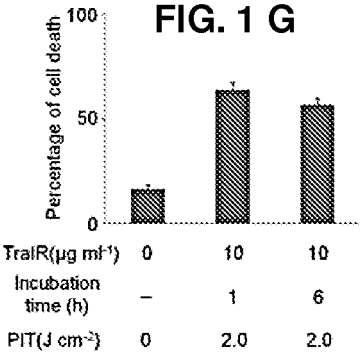


FIG. 1 H

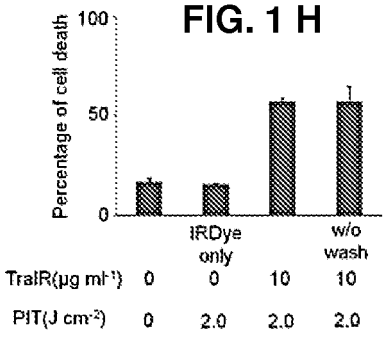


FIG. 1 I

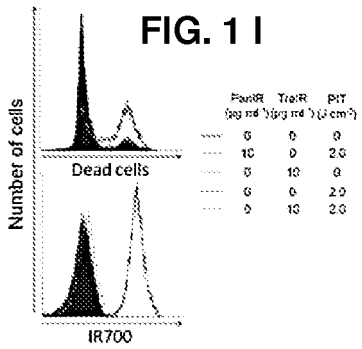


FIG. 1 J

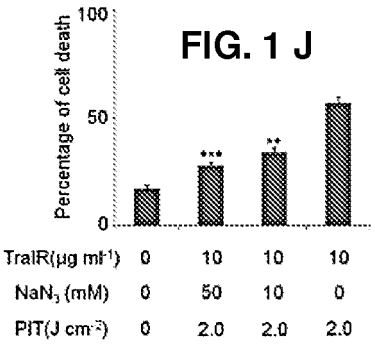


FIG. 2 A

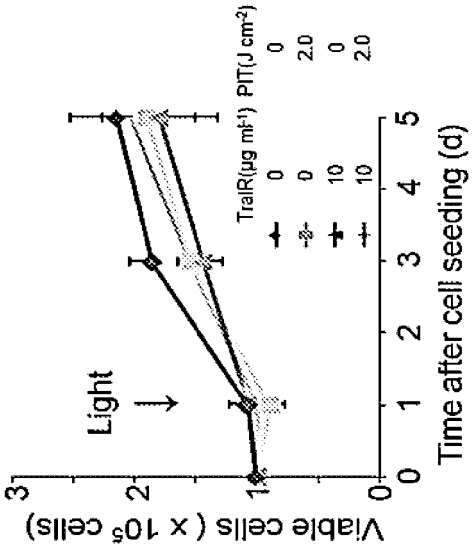


FIG. 2 B

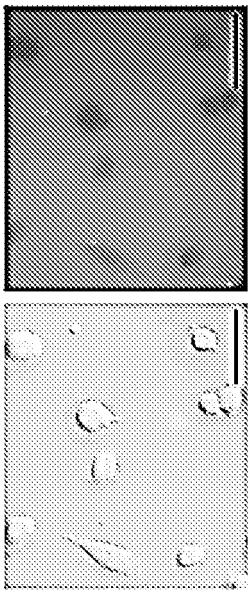


FIG. 2 D

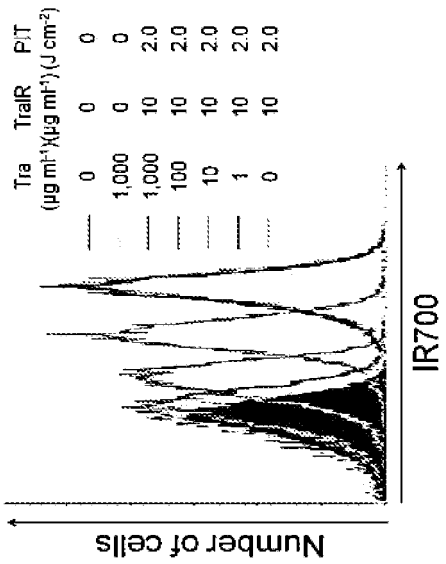


FIG. 2 D

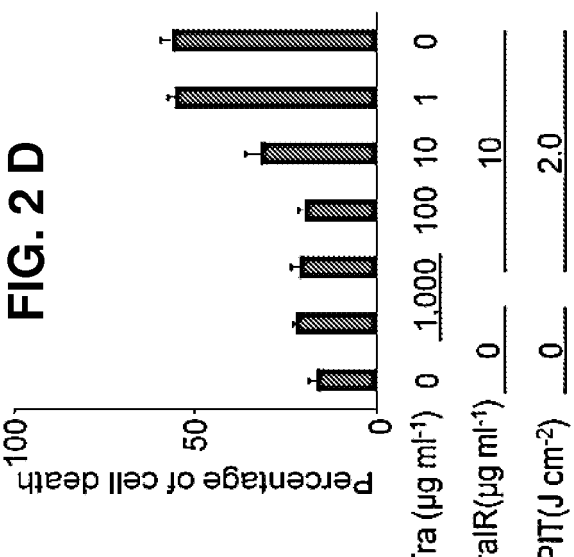


FIG. 3 A

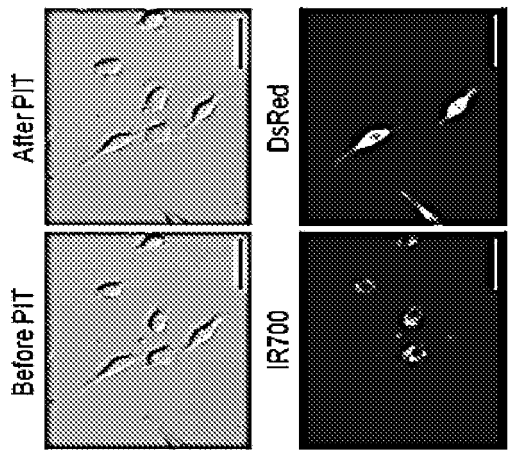


FIG. 3 B

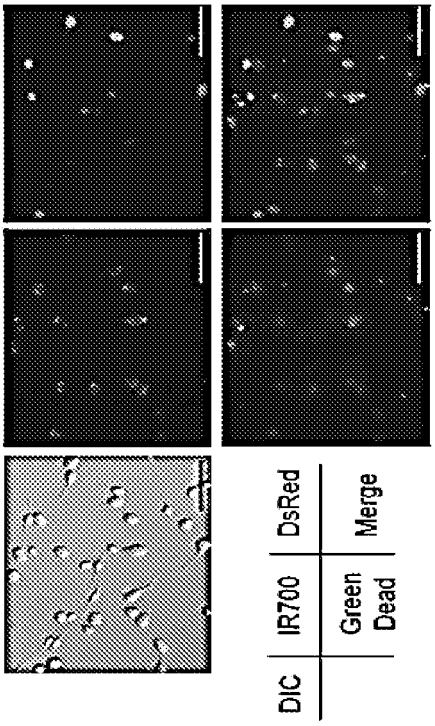


FIG. 3 C

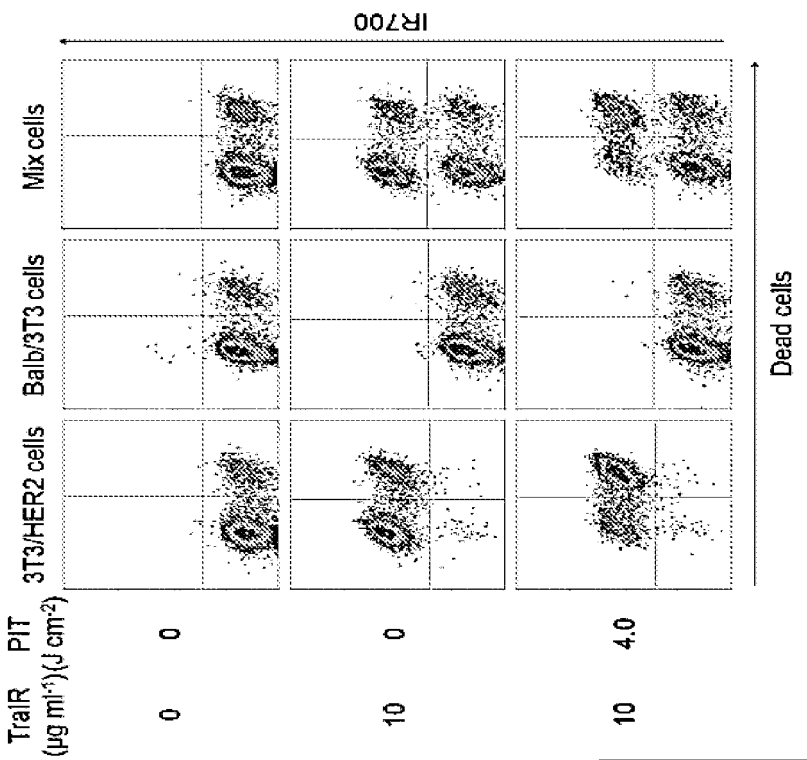


FIG. 4 A

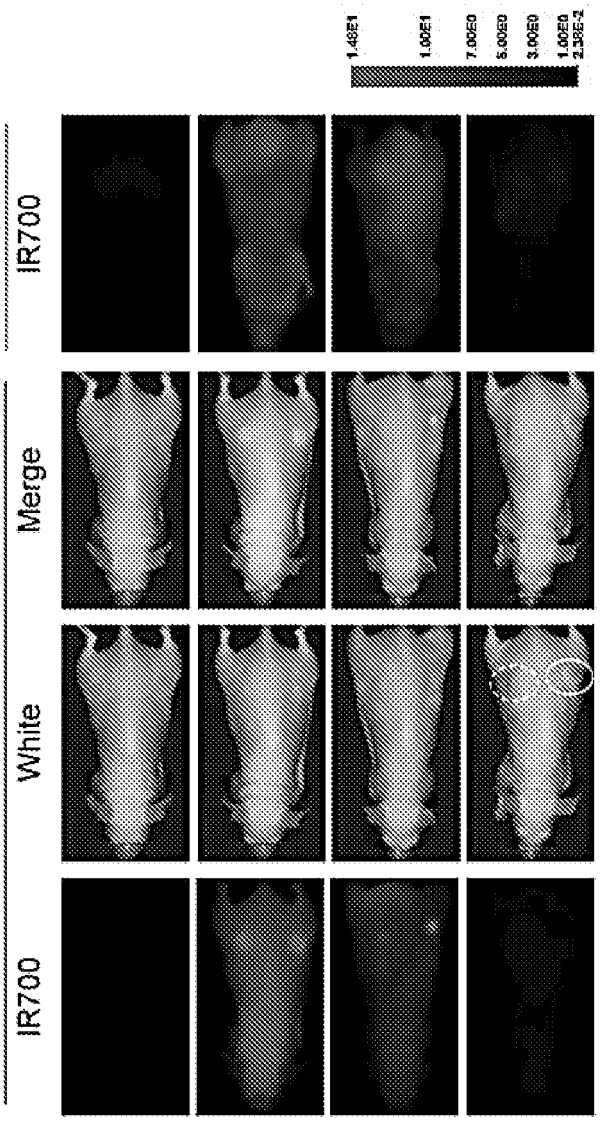

Back
Belly
IR700
White
Merge
IR700
Before
Day 1
Day 2
Day 7
1.48E1
1.00E1
7.00E0
5.00E0
3.00E0
1.00E0
2.38E-2

FIG. 4 B

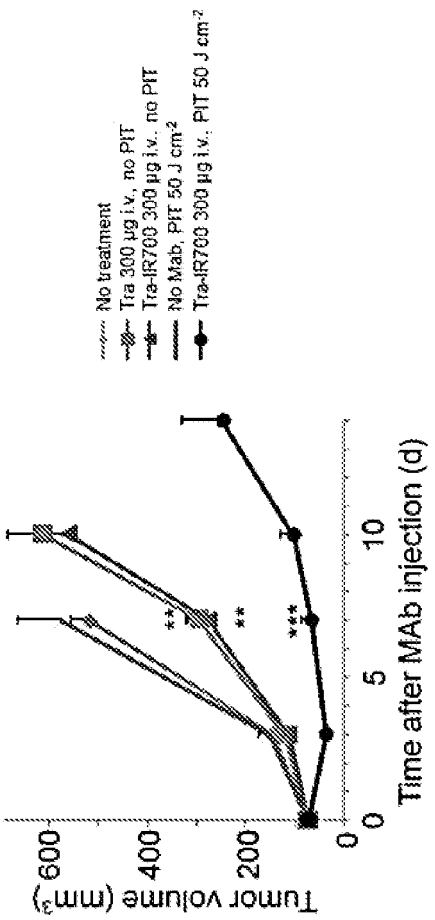

No treatment
Tra 300 µg i.v., no PIT
Tra-IR700 300 µg i.v., no PIT
No Mab, PIT 50 J cm-2
Tra-IR700 300 µg i.v., PIT 50 J cm-2
Tumor volume (mm3)
600
400
200
0
0
5
10
Time after MAb injection (d)
**
***
***

FIG. 5 A

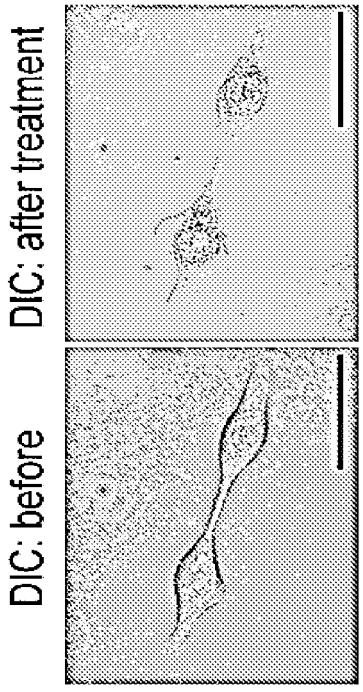


FIG. 5 B

FIG. 5 C

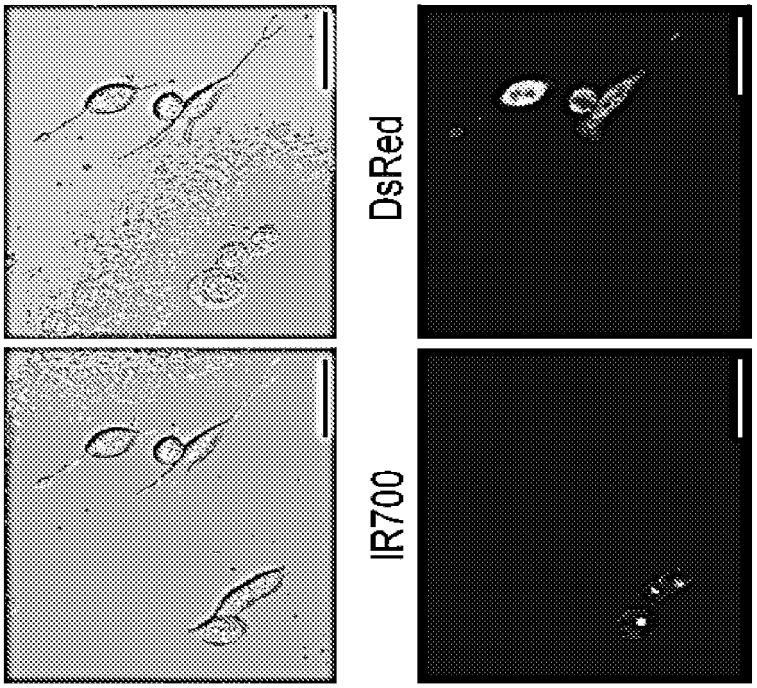


FIG. 6 A

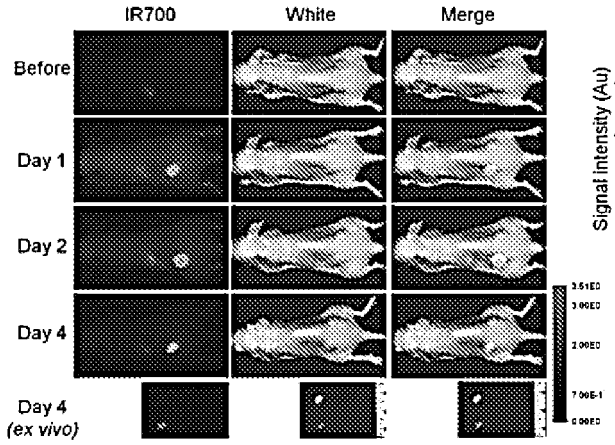


FIG. 6 B

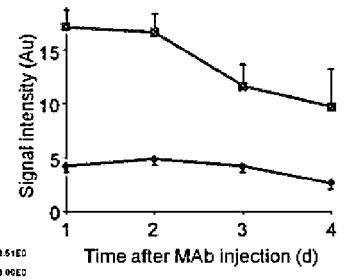


FIG. 6 C

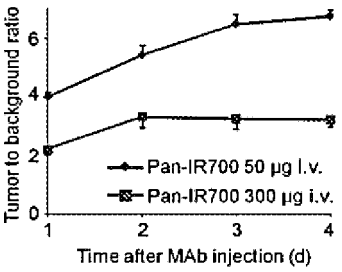


FIG. 6 E

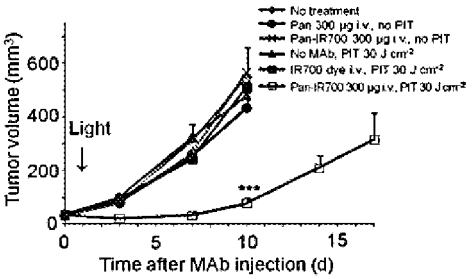
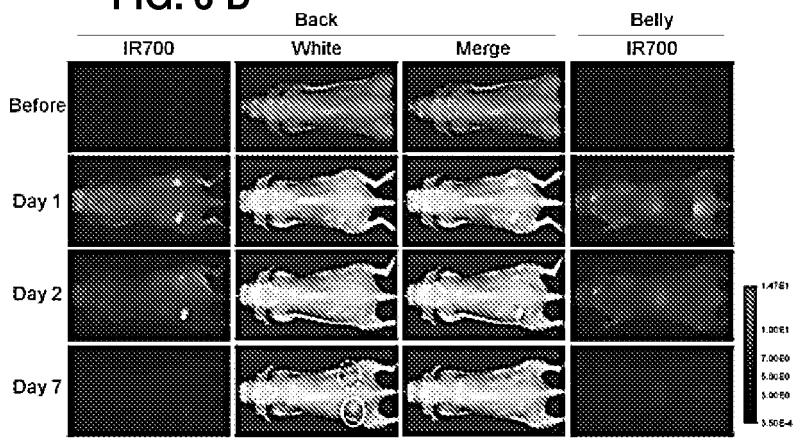


FIG. 6 D



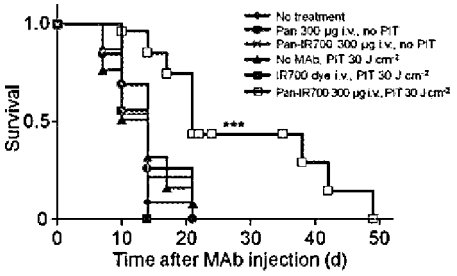


FIG. 6 F

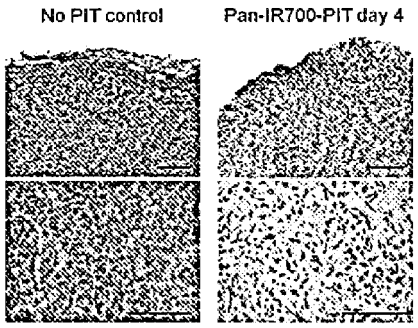


FIG. 6 G

FIG. 6 H

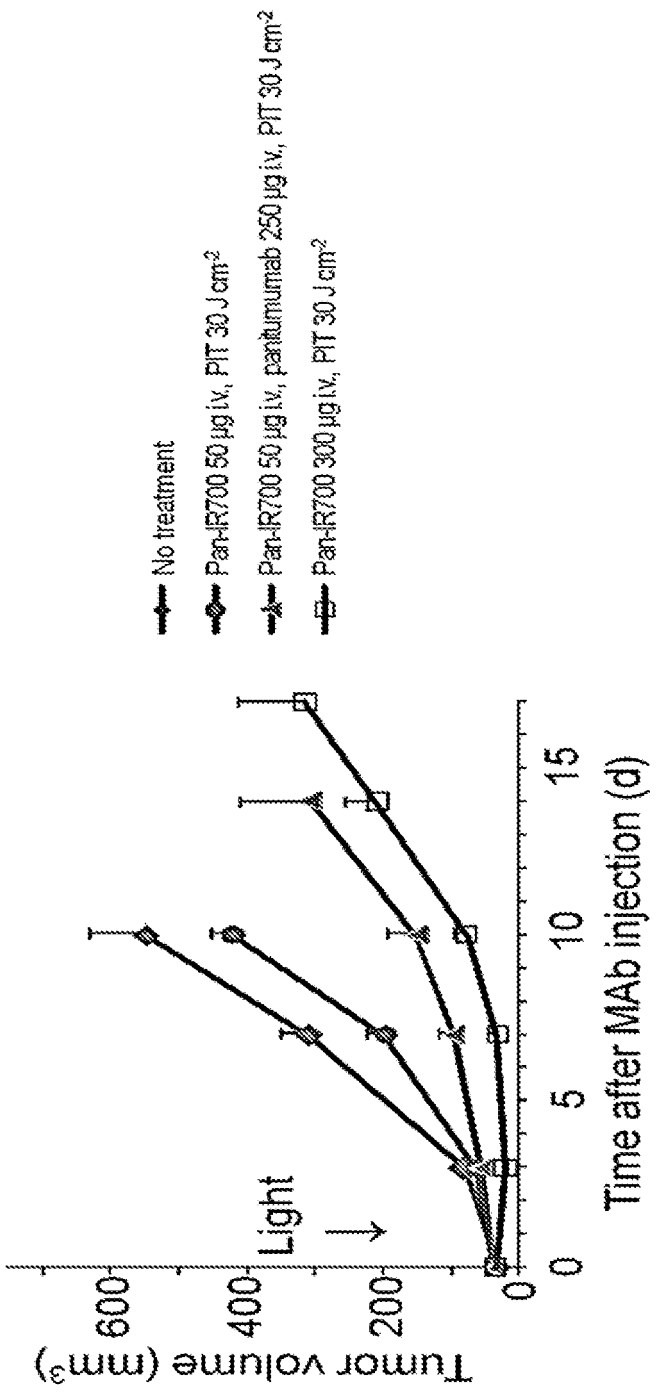

No treatment
Pan-IR700 50 µg i.v., PIT 30 J cm-2
Pan-IR700 50 µg i.v., panitumumab 250 µg i.v., PIT 30 J cm-2
Pan-IR700 300 µg i.v., PIT 30 J cm-2
Tumor volume (mm3)
600
400
200
0
Light
0
5
10
15
Time after MAb injection (d)

FIG. 7

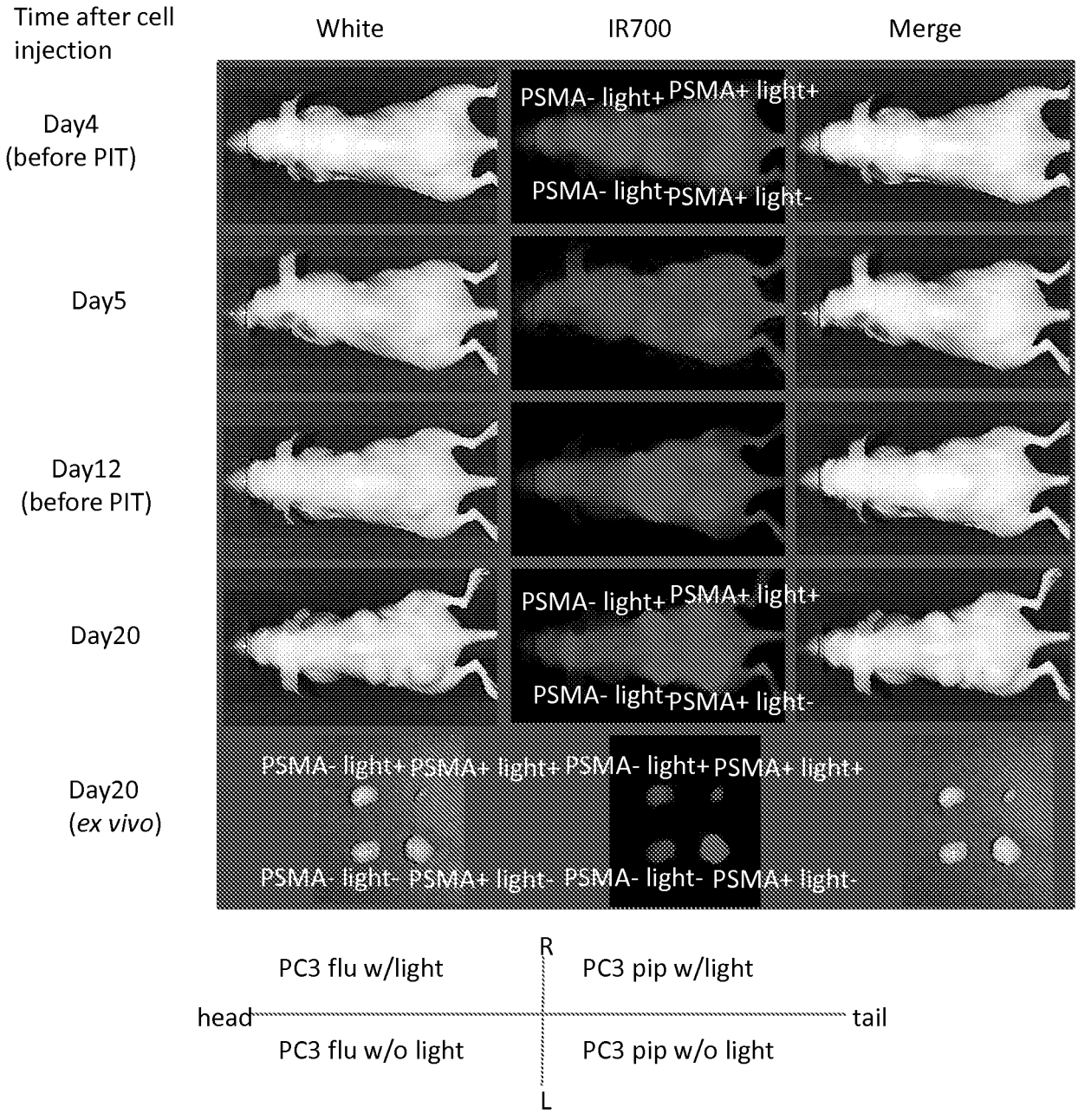

Time after cell injection
White
IR700
Merge
Day4 (before PIT)
Day5
Day12 (before PIT)
Day20
Day20 (ex vivo)
PSMA- light+
PSMA+ light+
PSMA- light-
PSMA+ light-
R
L
head
tail
PC3 flu w/light
PC3 pip w/light
PC3 flu w/o light
PC3 pip w/o light

FIG. 8

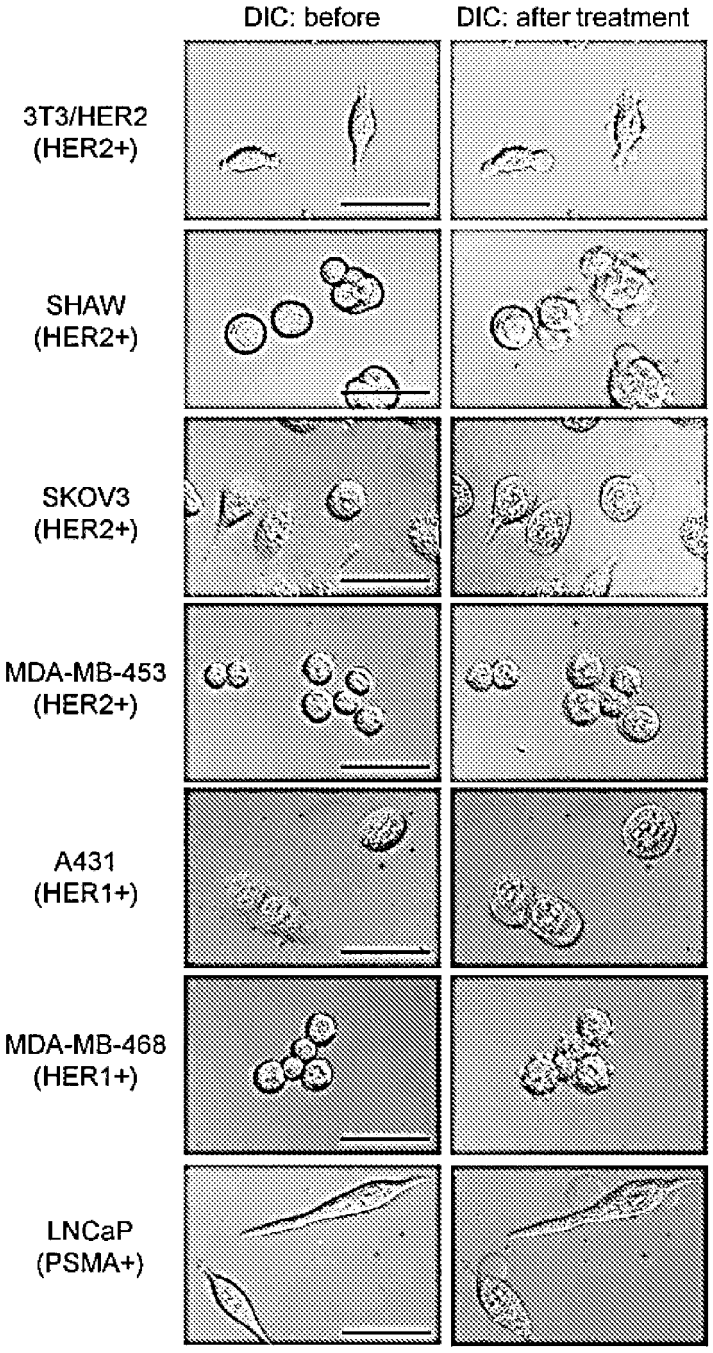
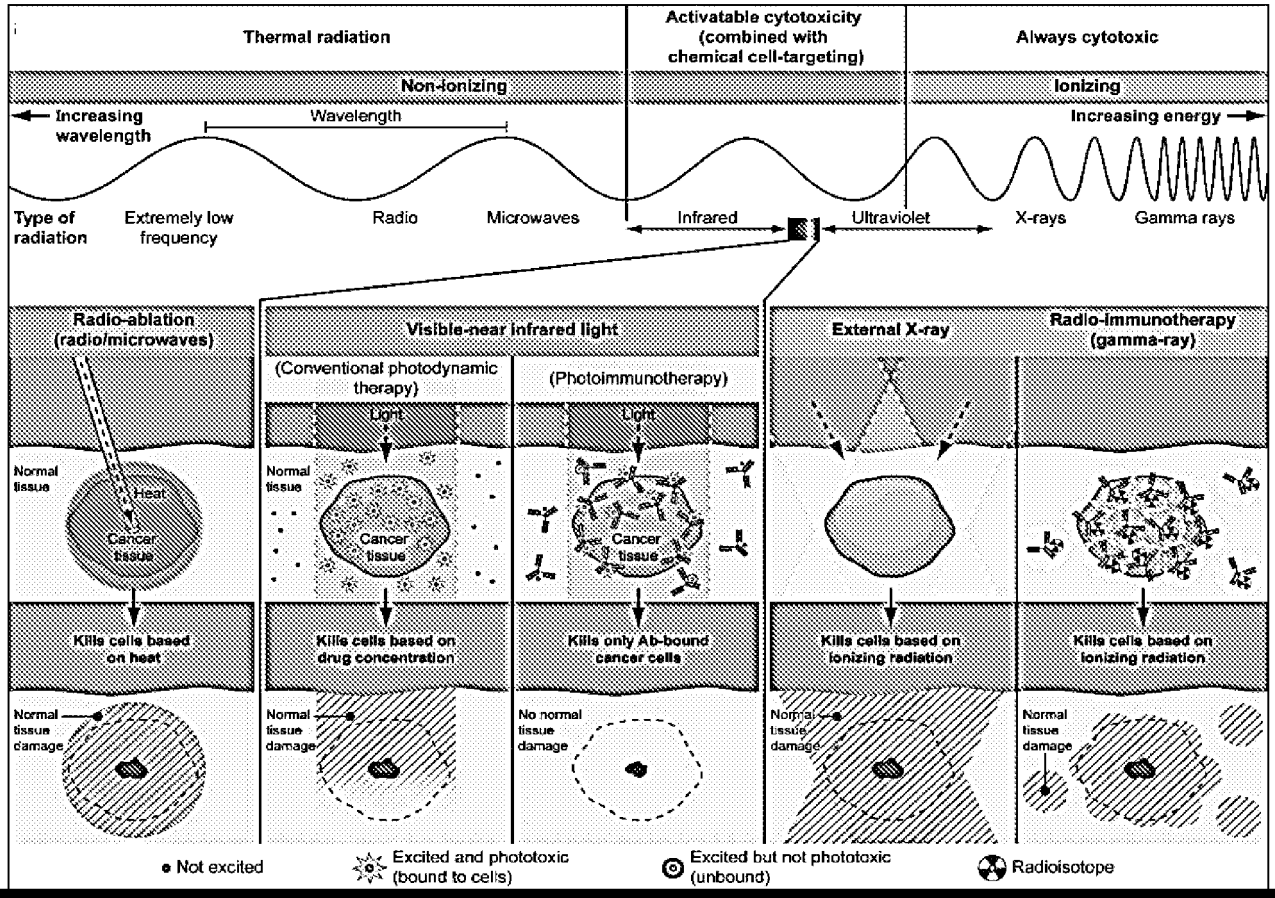

DIC: before
DIC: after treatment
3T3/HER2
(HER2+)
SHAW
(HER2+)
SKOV3
(HER2+)
MDA-MB-453
(HER2+)
A431
(HER1+)
MDA-MB-468
(HER1+)
LNCaP
(PSMA+)

FIG. 9 A


Thermal radiation
Activatable cytotoxicity (combined with chemical cell-targeting)
Always cytotoxic
Non-ionizing
Ionizing
Increasing wavelength
Wavelength
Increasing energy
Type of radiation
Extremely low frequency
Radio
Microwaves
Infrared
Ultraviolet
X-rays
Gamma rays
Radio-ablation (radio/microwaves)
Visible-near infrared light
External X-ray
Radio-immunotherapy (gamma-ray)
(Conventional photodynamic therapy)
(Photoimmunotherapy)
Light
Normal tissue
Heat
Cancer tissue
Kills cells based on heat
Kills cells based on drug concentration
Kills only Ab-bound cancer cells
Kills cells based on ionizing radiation
Normal tissue damage
No normal tissue damage
Not excited
Excited and phototoxic (bound to cells)
Excited but not phototoxic (unbound)
Radioisotope

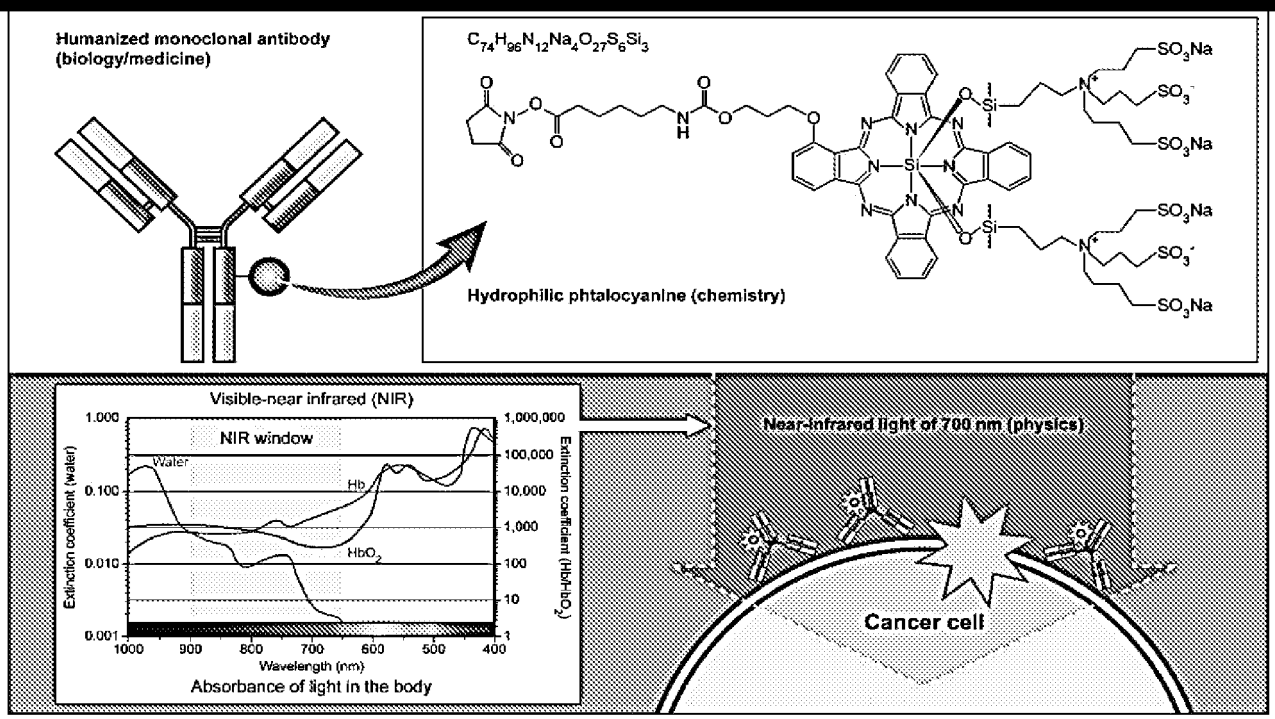

Humanized monoclonal antibody (biology/medicine)
$C_{74}H_{96}N_{12}Na_4O_{27}S_6Si_3$
Hydrophilic phtalocyanine (chemistry)
Visible-near infrared (NIR)
NIR window
Water
Hb
HbO_2
Extinction coefficient (water)
Extinction coefficient (Hb/HbO_2)
Wavelength (nm)
Absorbance of light in the body
Near-infrared light of 700 nm (physics)
Cancer cell

FIG. 9 B

FIG. 10 A

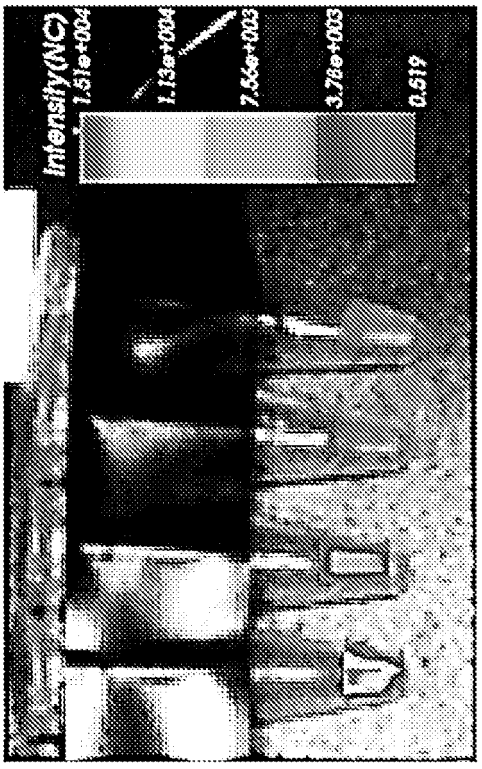


FIG. 10 B

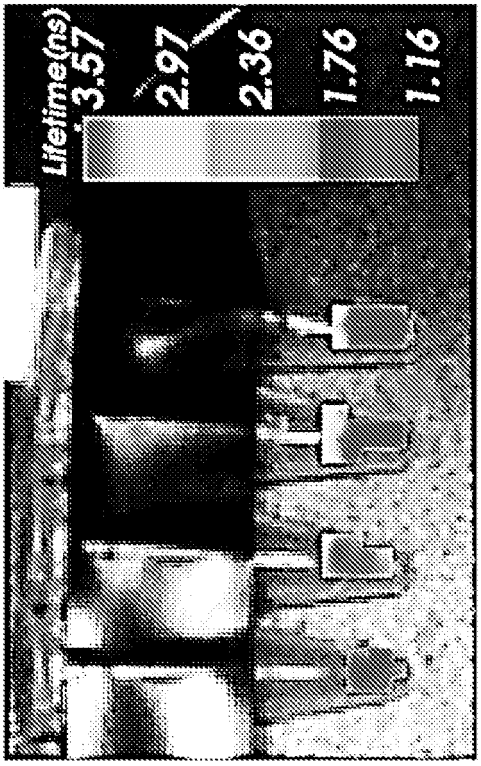


FIG. 10 C

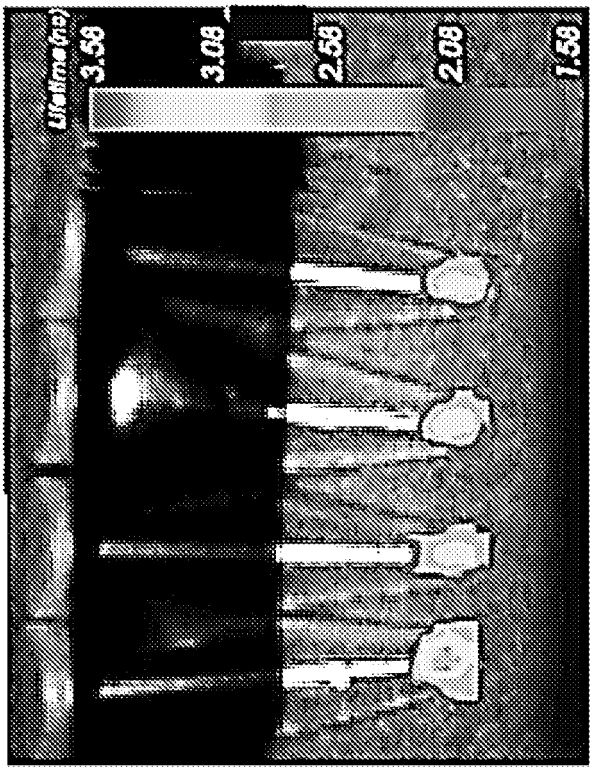


FIG. 10 D

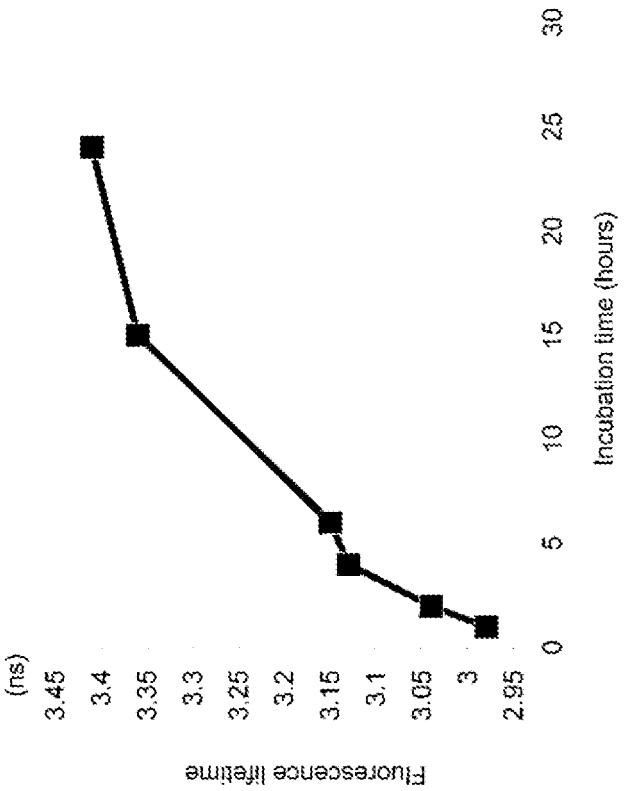




FIG. 11

FIG. 12 A

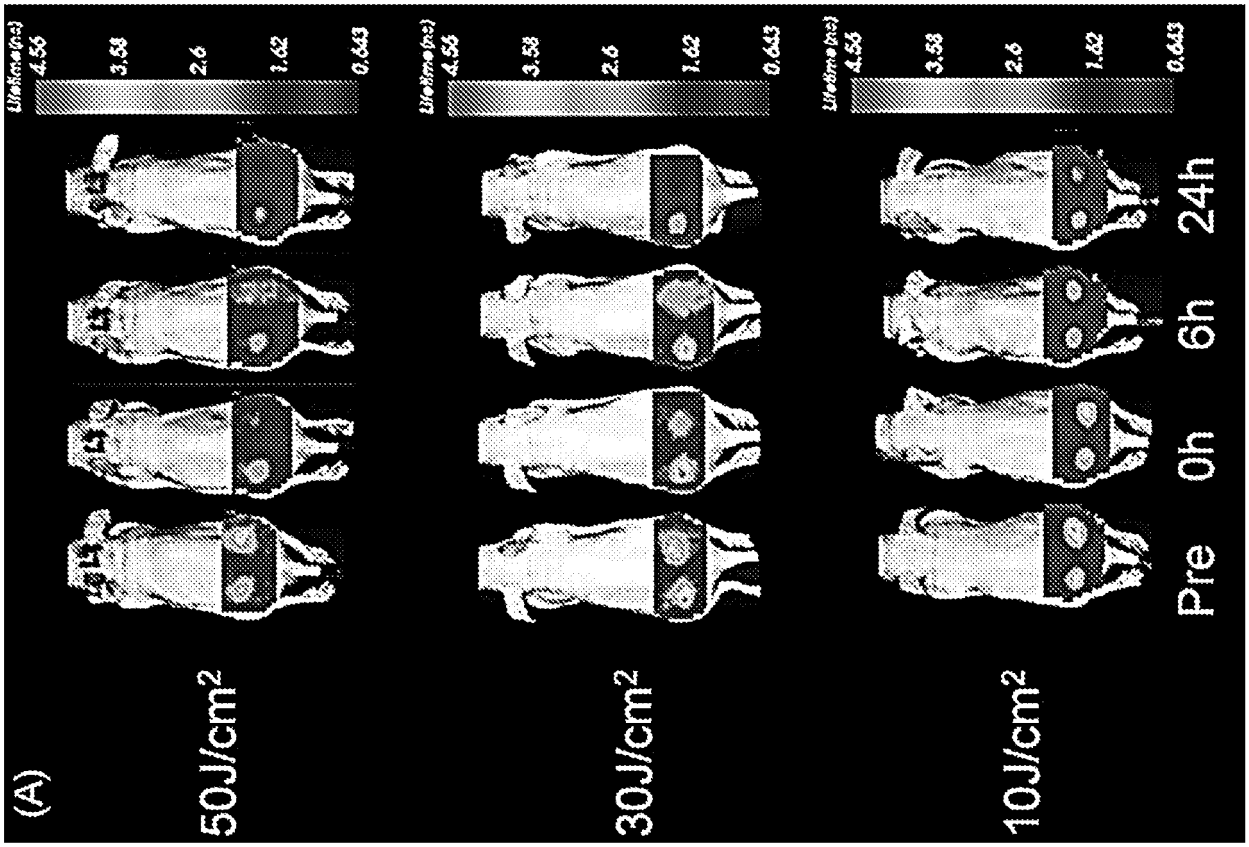


FIG. 12 B

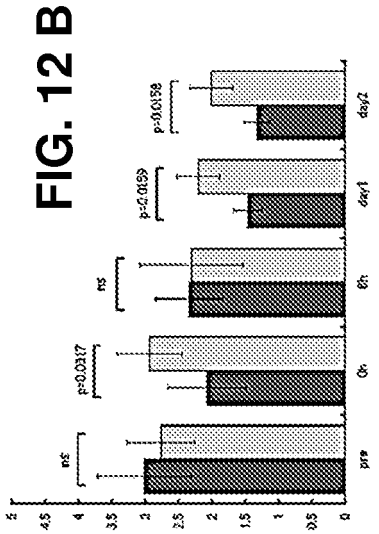


FIG. 12 C

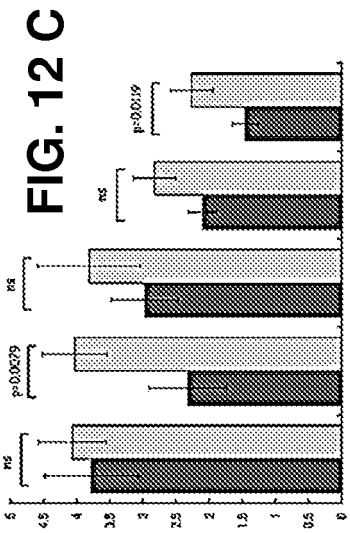


FIG. 12 D

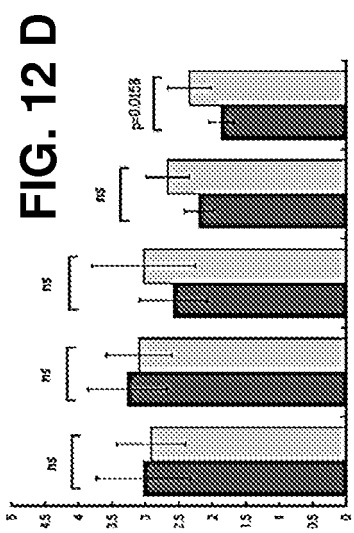


FIG. 13 C

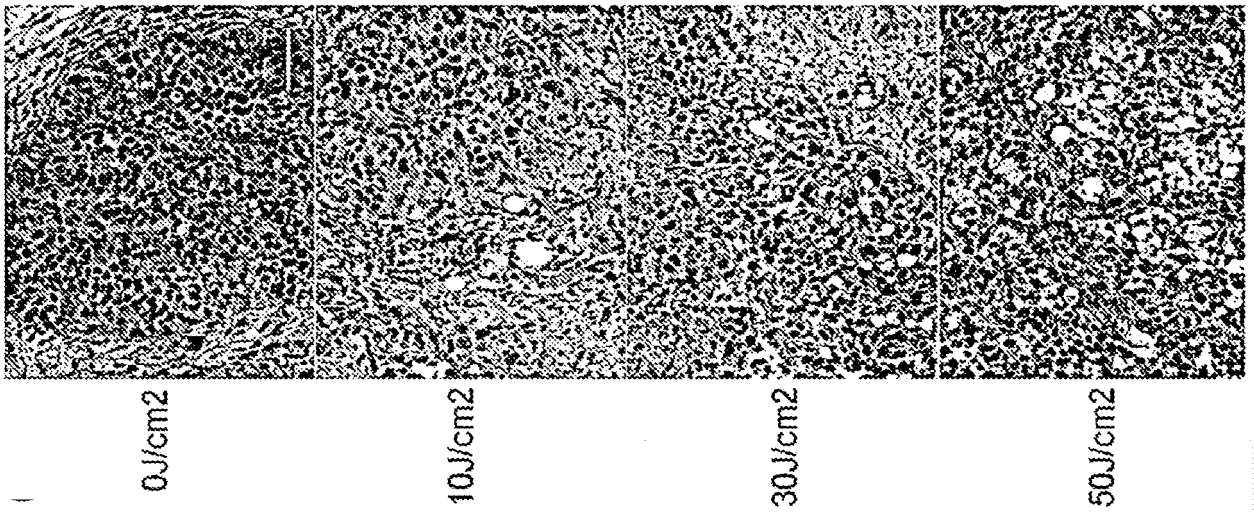


FIG. 13 A

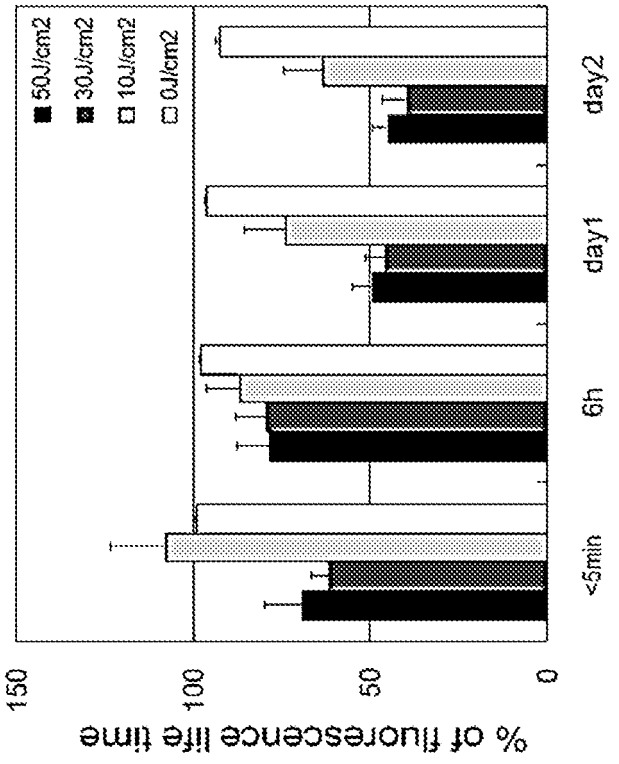
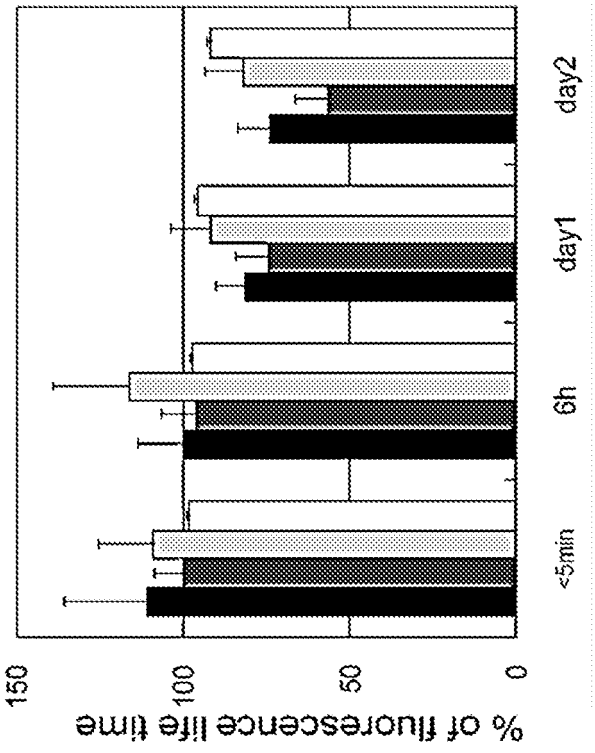


FIG. 13 B



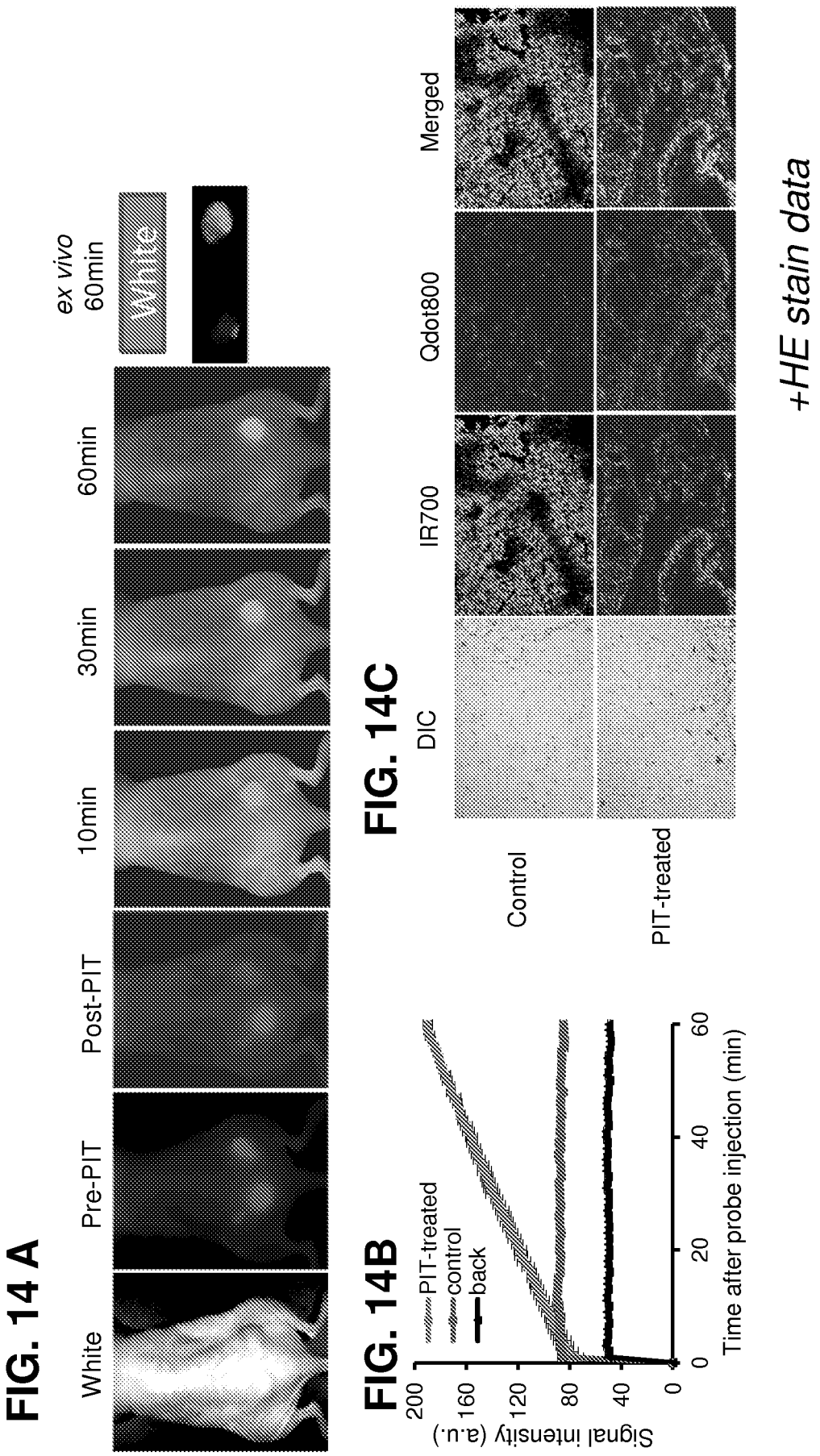

FIG. 14 A
White
Pre-PIT
Post-PIT
10min
30min
60min
ex vivo
60min
White
FIG. 14B
PIT-treated
control
back
Signal intensity (a.u.)
200
160
120
80
40
0
0
20
40
60
Time after probe injection (min)
FIG. 14C
DIC
IR700
Qdot800
Merged
Control
PIT-treated
+HE stain data

FIG. 15A

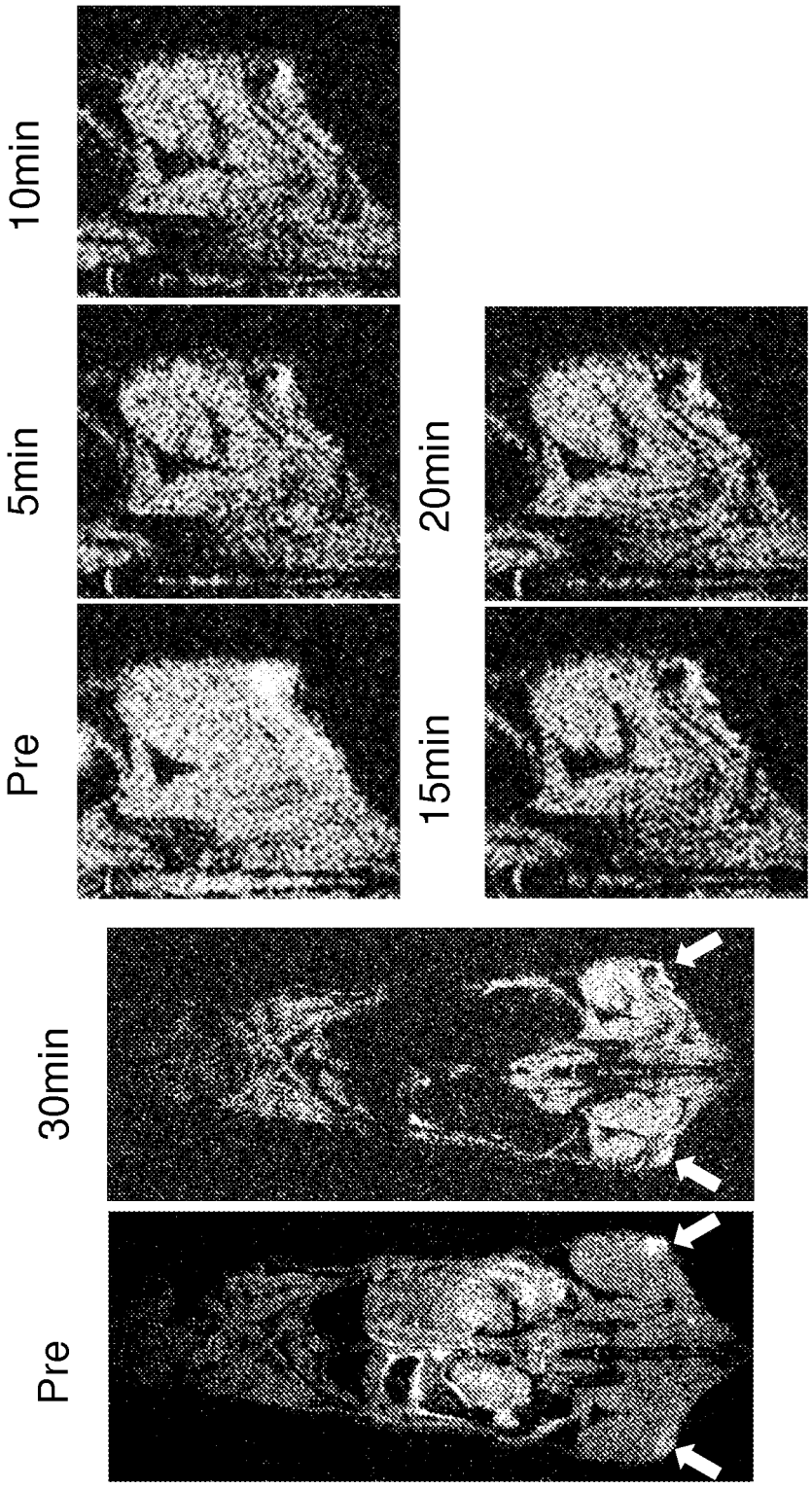
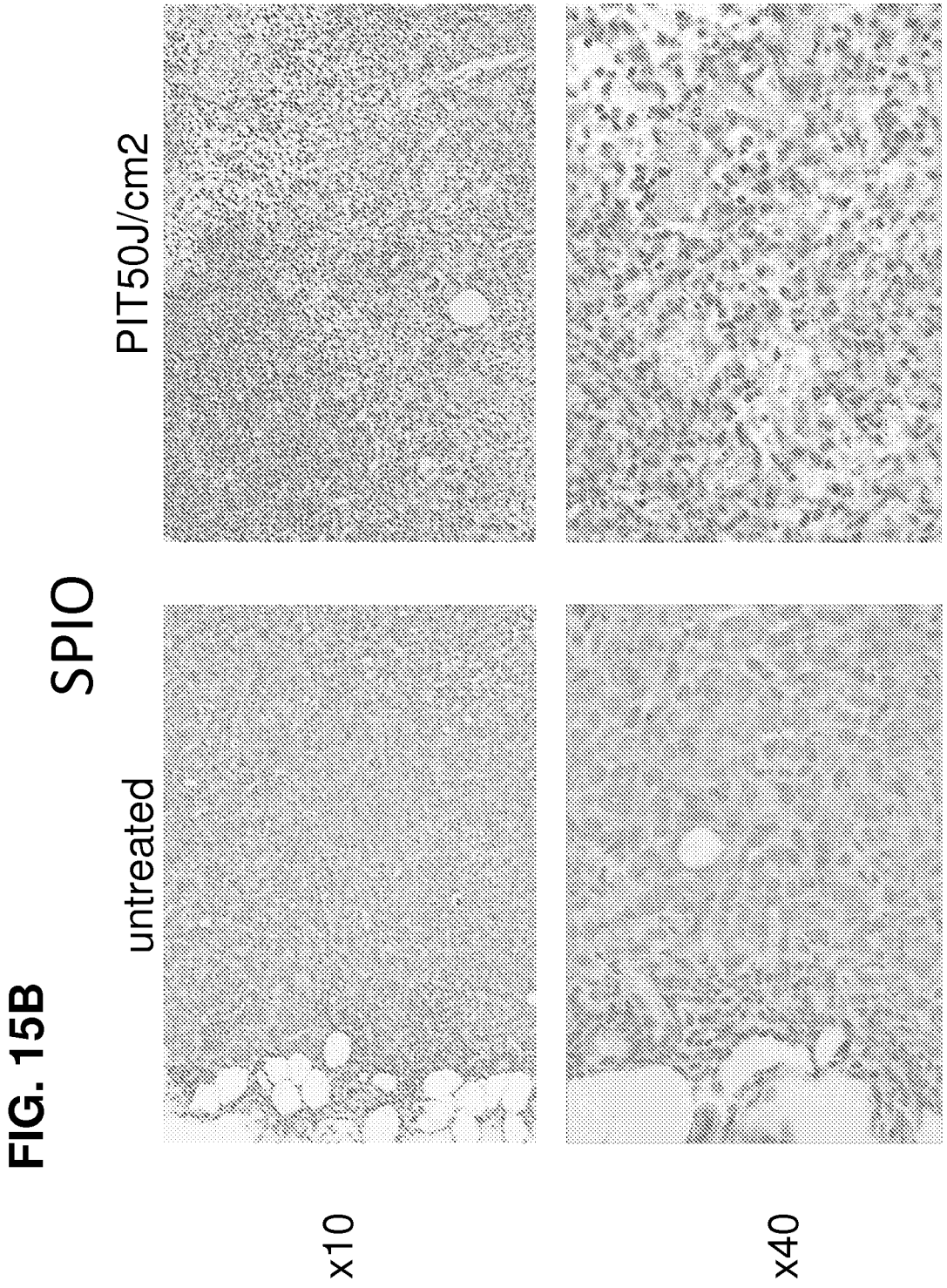


FIG. 15B



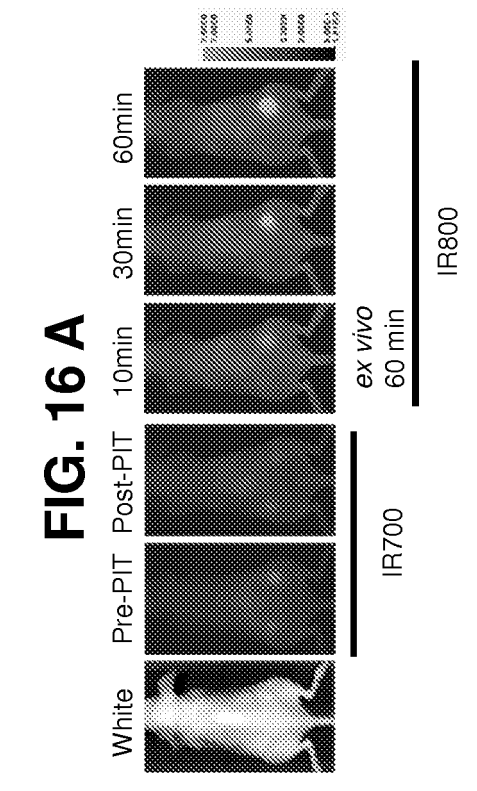


FIG. 16 A

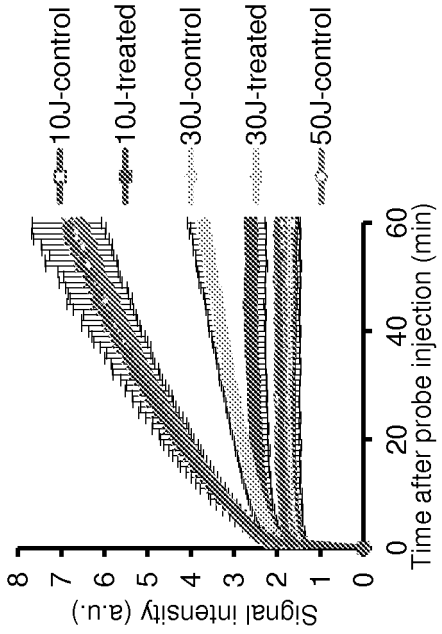


FIG. 16B

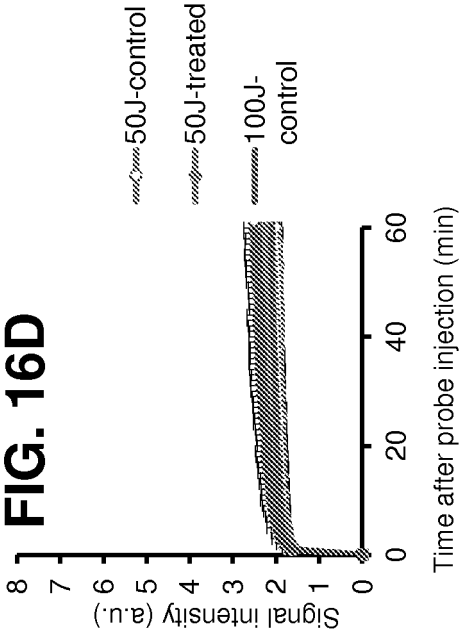


FIG. 16D

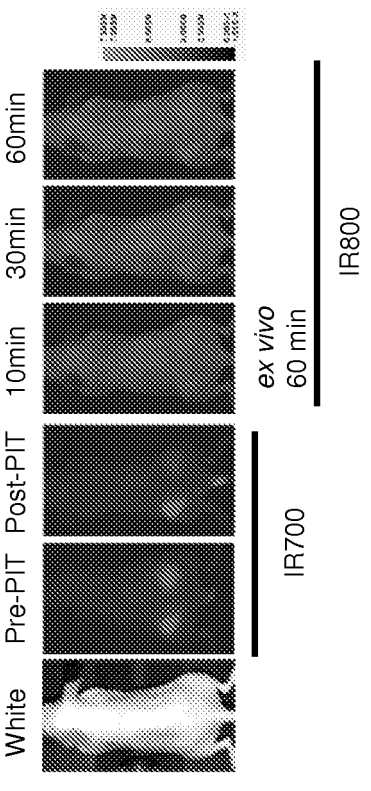


FIG. 16 C

FIG. 17A

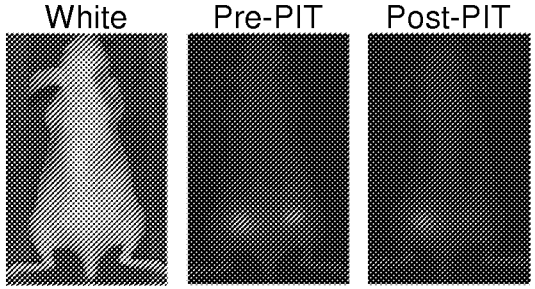


FIG. 17B

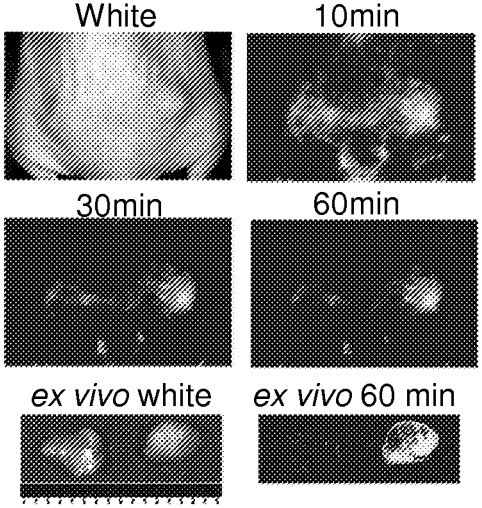


FIG. 17C

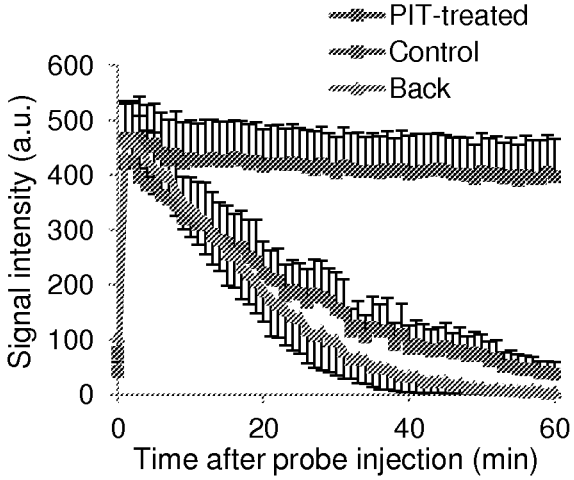


FIG. 17D

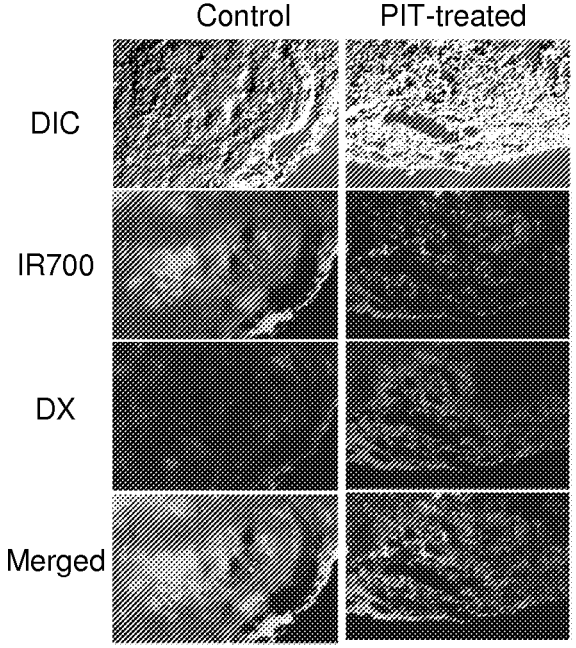


FIG. 17E

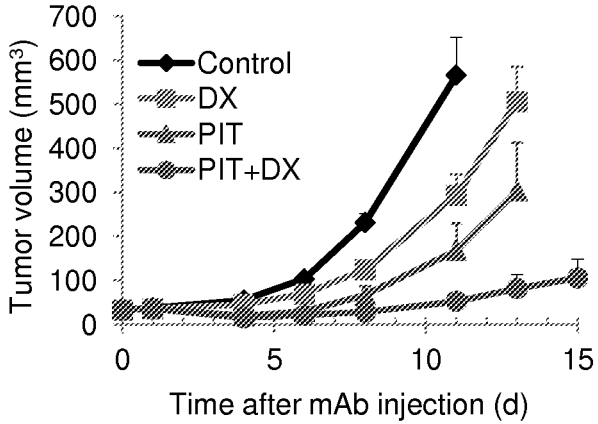


FIG. 17F

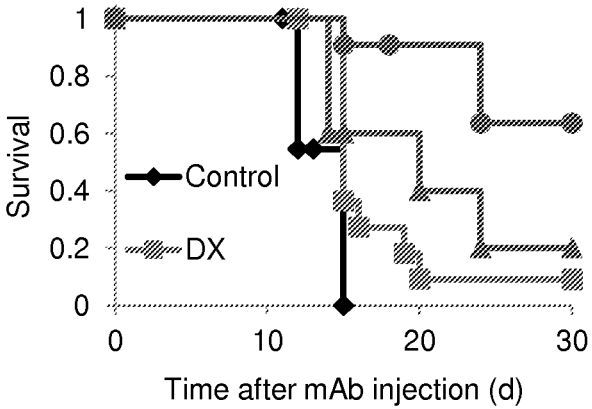
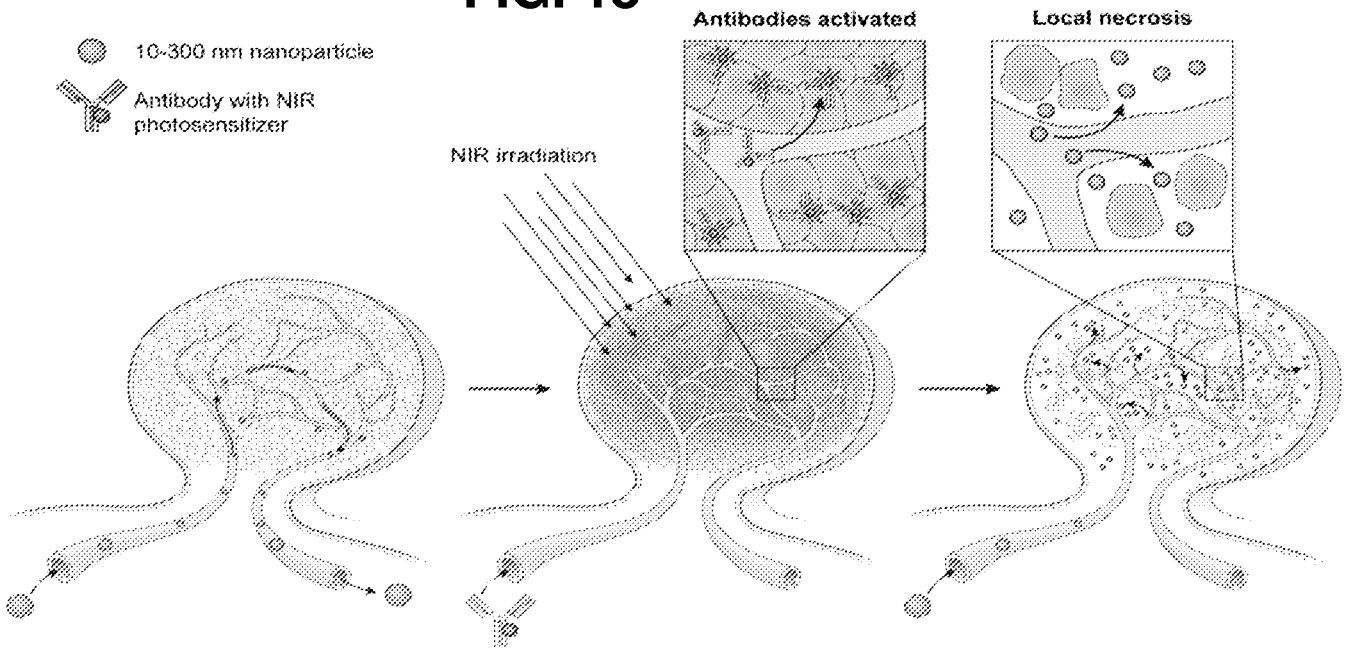


FIG. 18



Imaging and therapy Protocol

A431 mice → Pan-IR700 (24 h) → PIT (10-100J) (1 or 24 h) → Nano-probes → Dynamic imaging, Therapy monitoring

Nano-probes: mAb-IR800 (10 nm)
PEGylated Qdot800 (non-targeted) (50 nm)
SPIO (200 nm)
USPIO (30 nm)
G6-Gd (10 nm)
Liposome containing daunorubicin (50 nm)

FIG. 19A

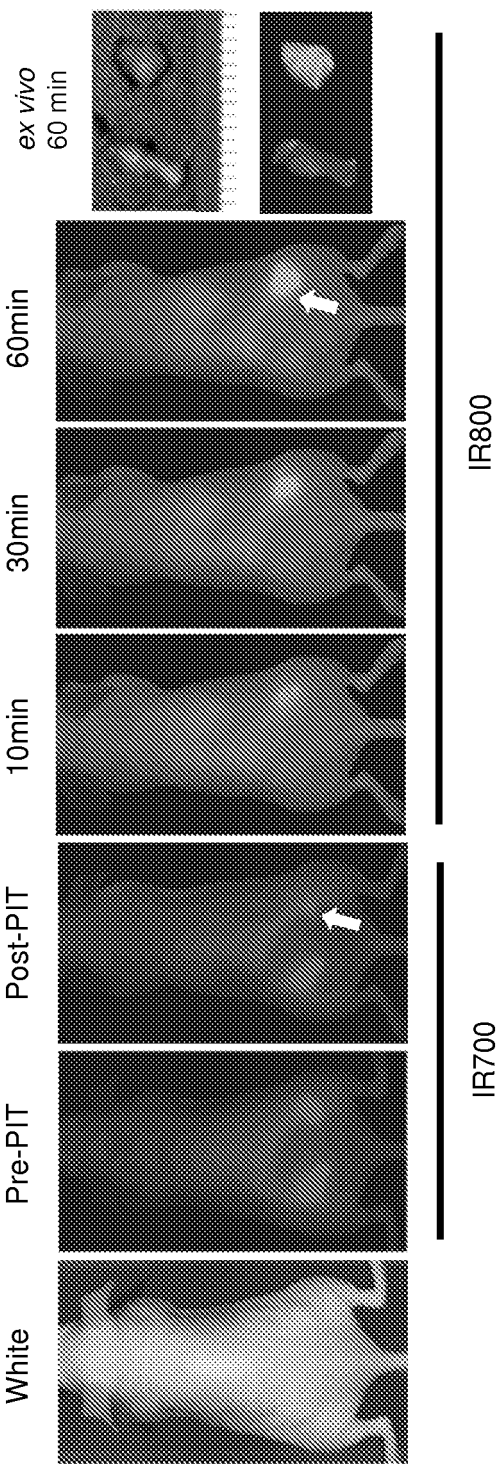


FIG. 19B

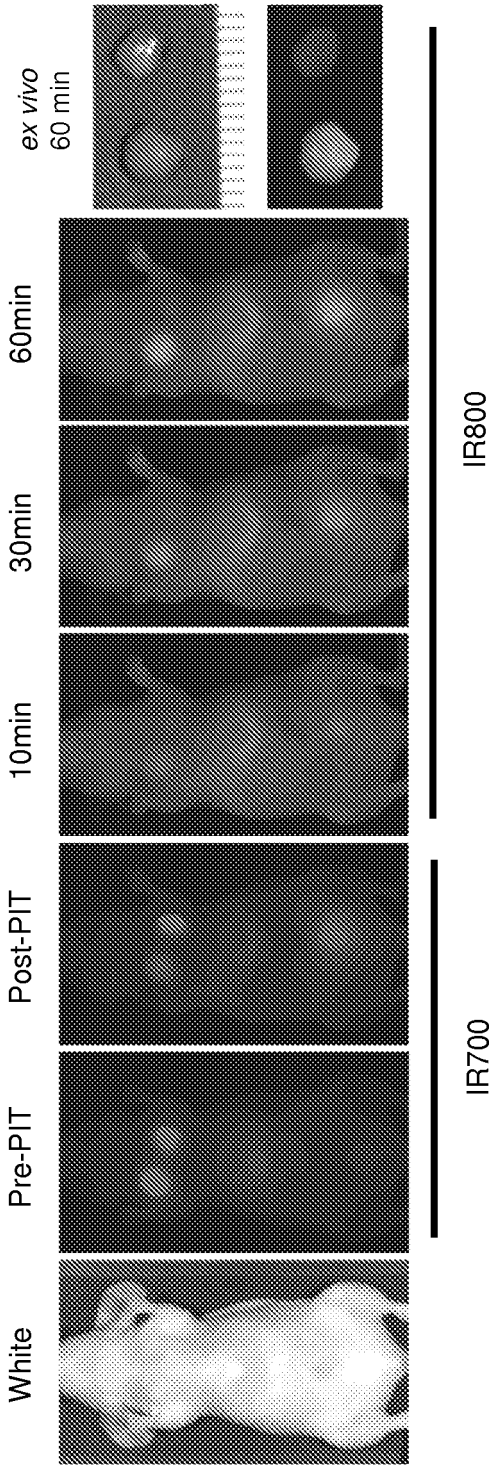


FIG. 20A

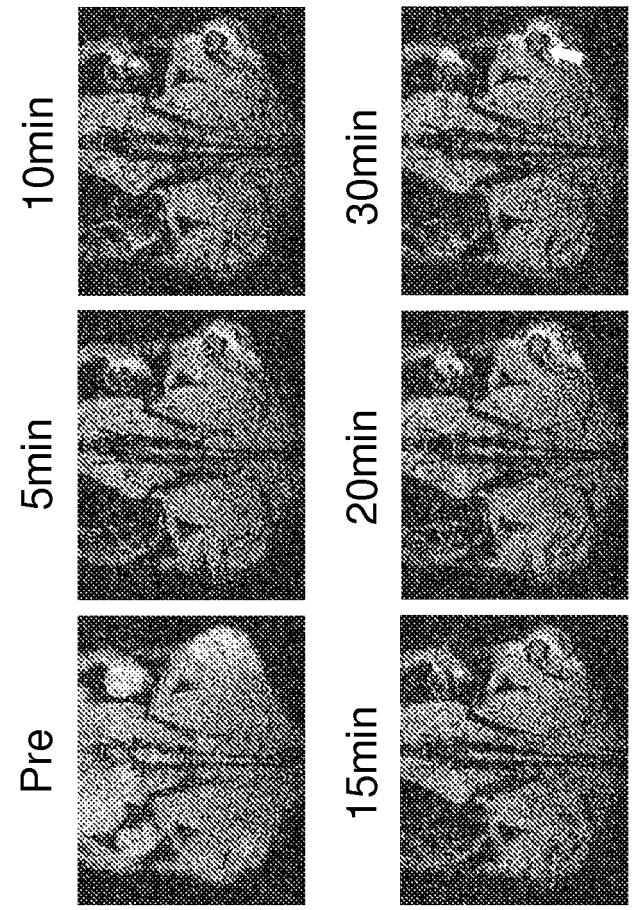
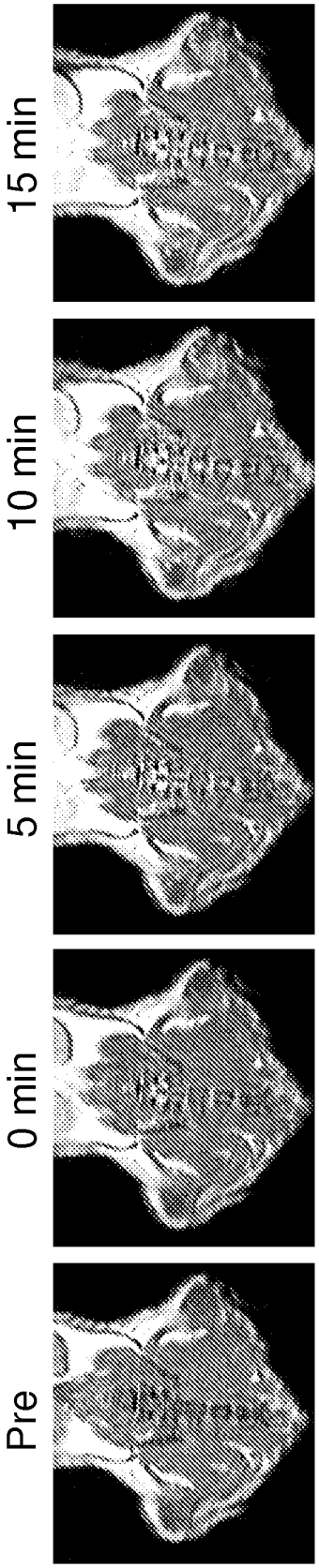


FIG. 20C



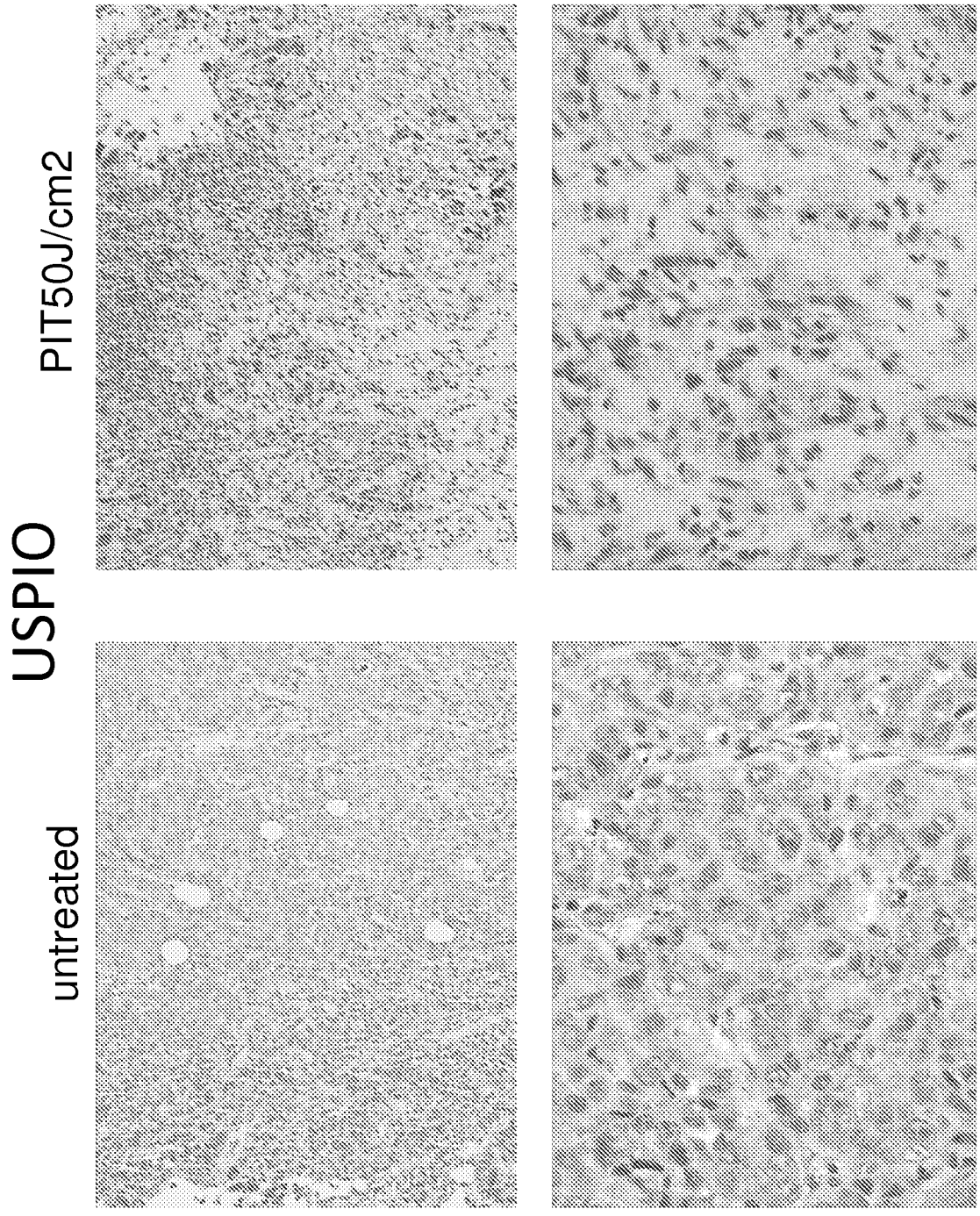


FIG. 20B

FIG. 21 A

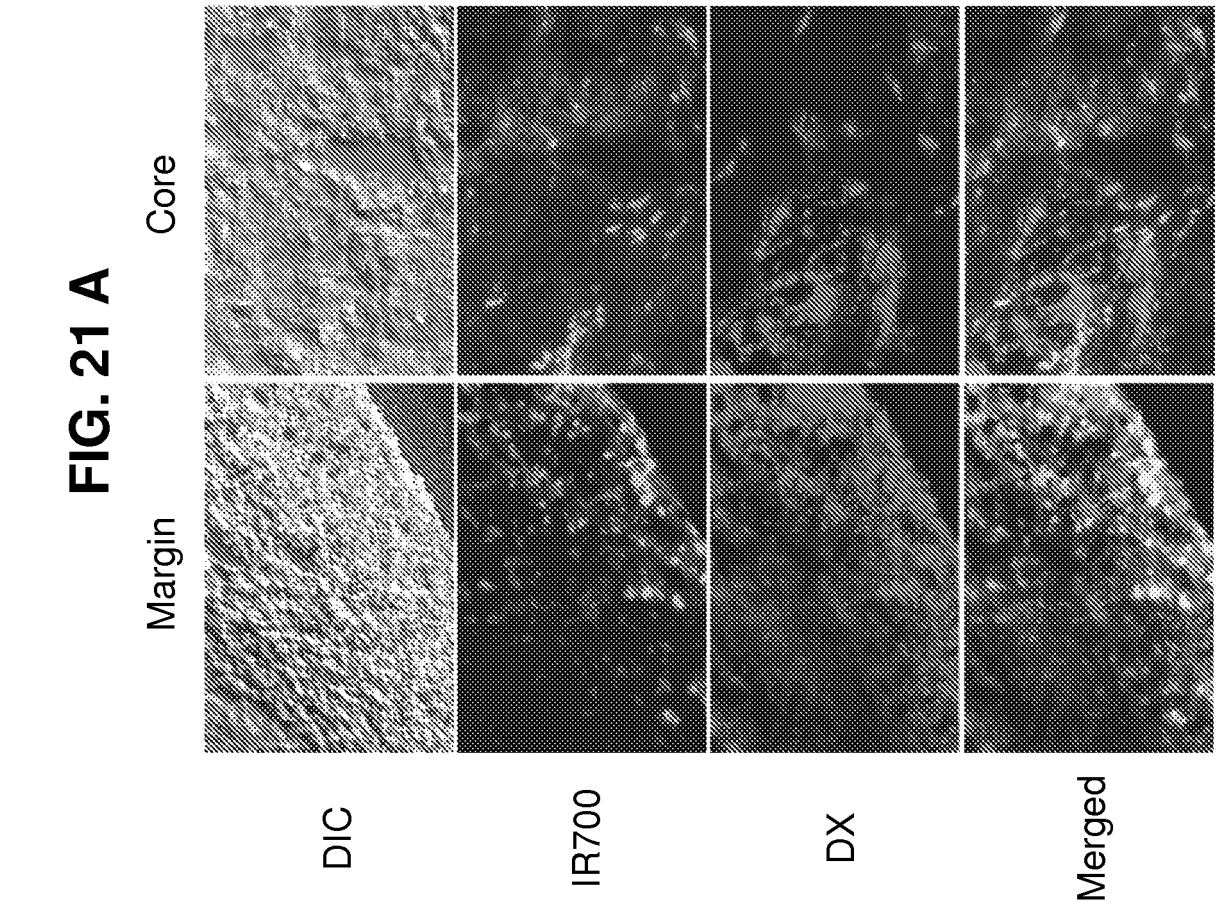


FIG. 21B

