Fig. 1

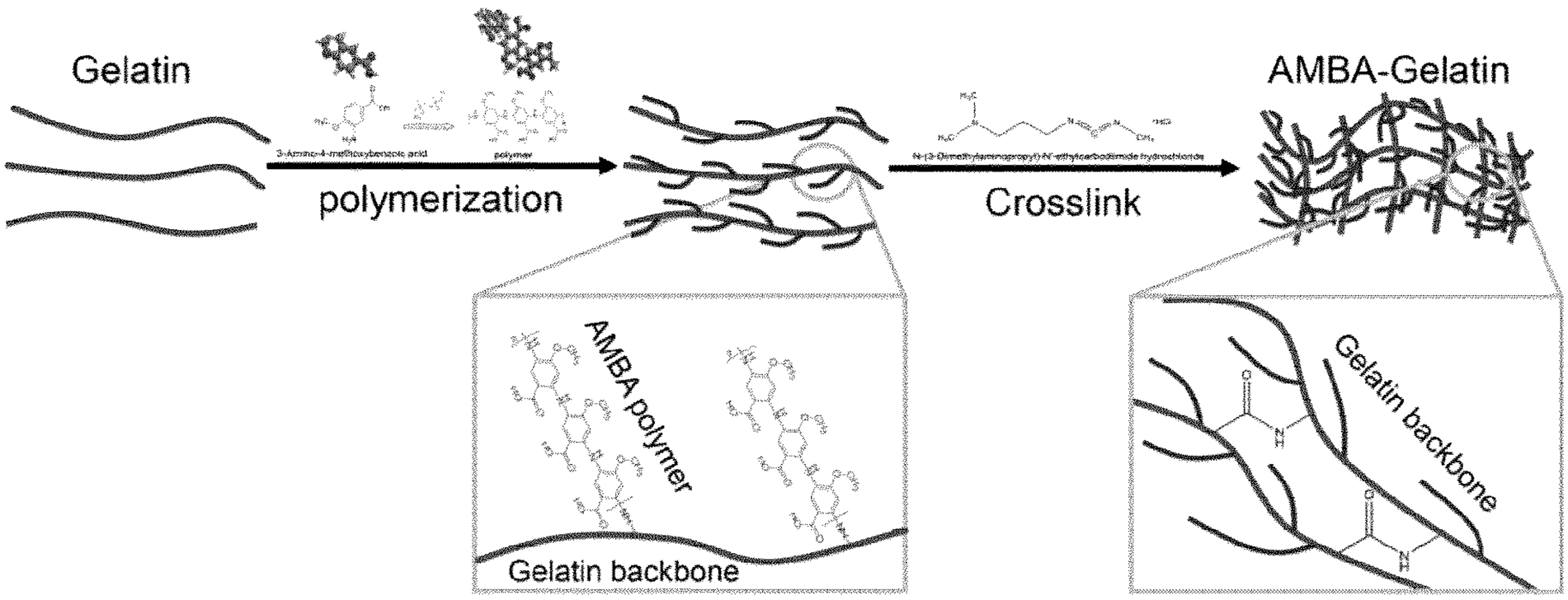
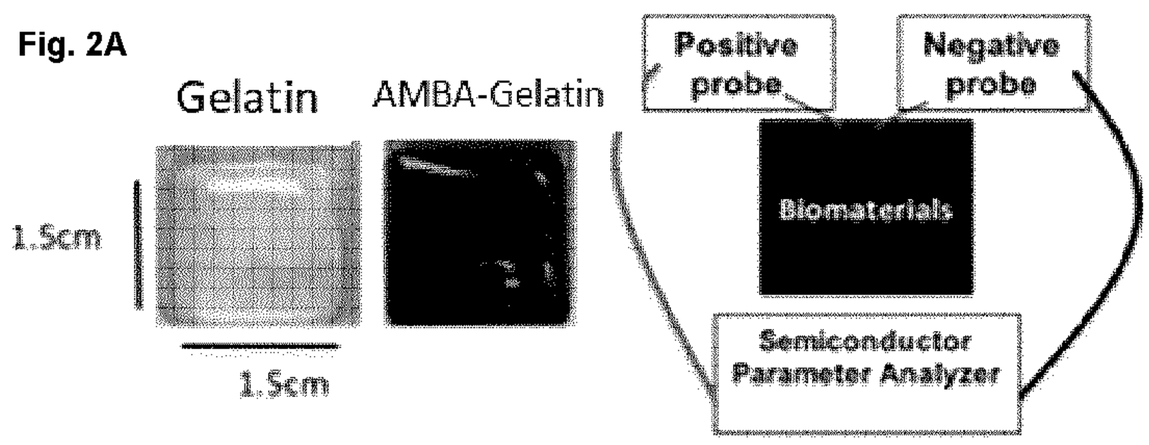


Fig. 2A



$$\text{Conductivity} = 1/(2\pi DR)$$

D is the distance between probes (mm)
R=V (mV)/I (mA) .

Fig. 2B

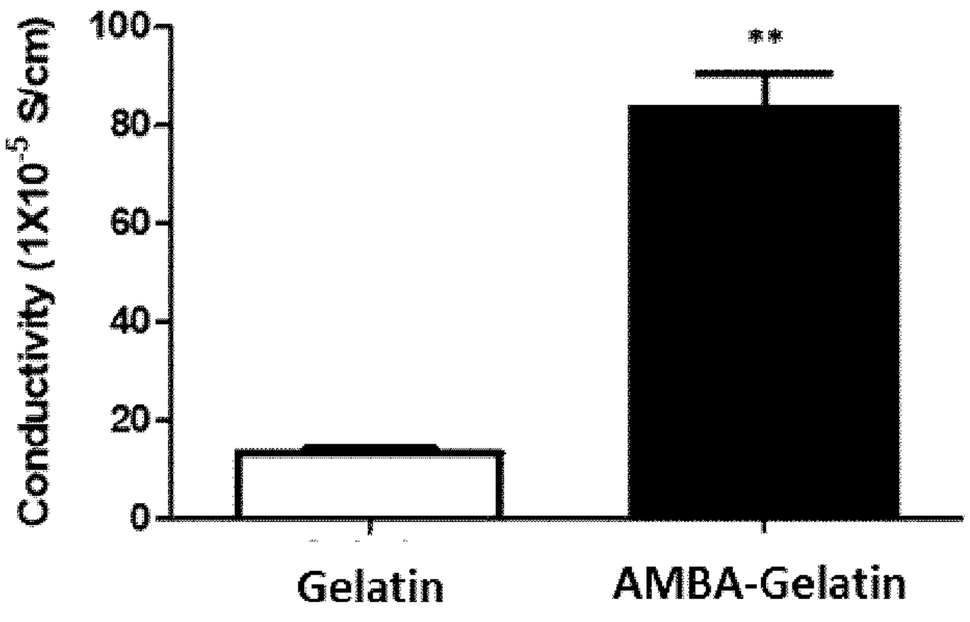


Fig. 2C

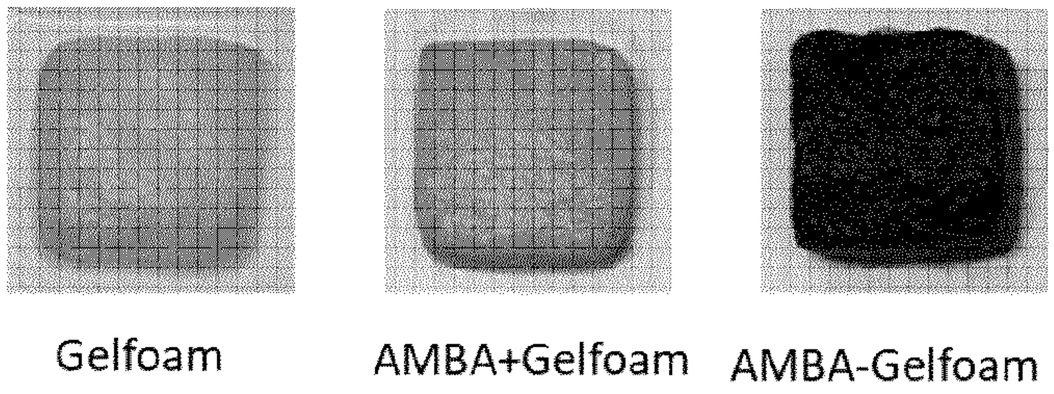

A 3-Dimensional Gelfoam Patch
Gelfoam
AMBA+Gelfoam
AMBA-Gelfoam

Fig. 2D

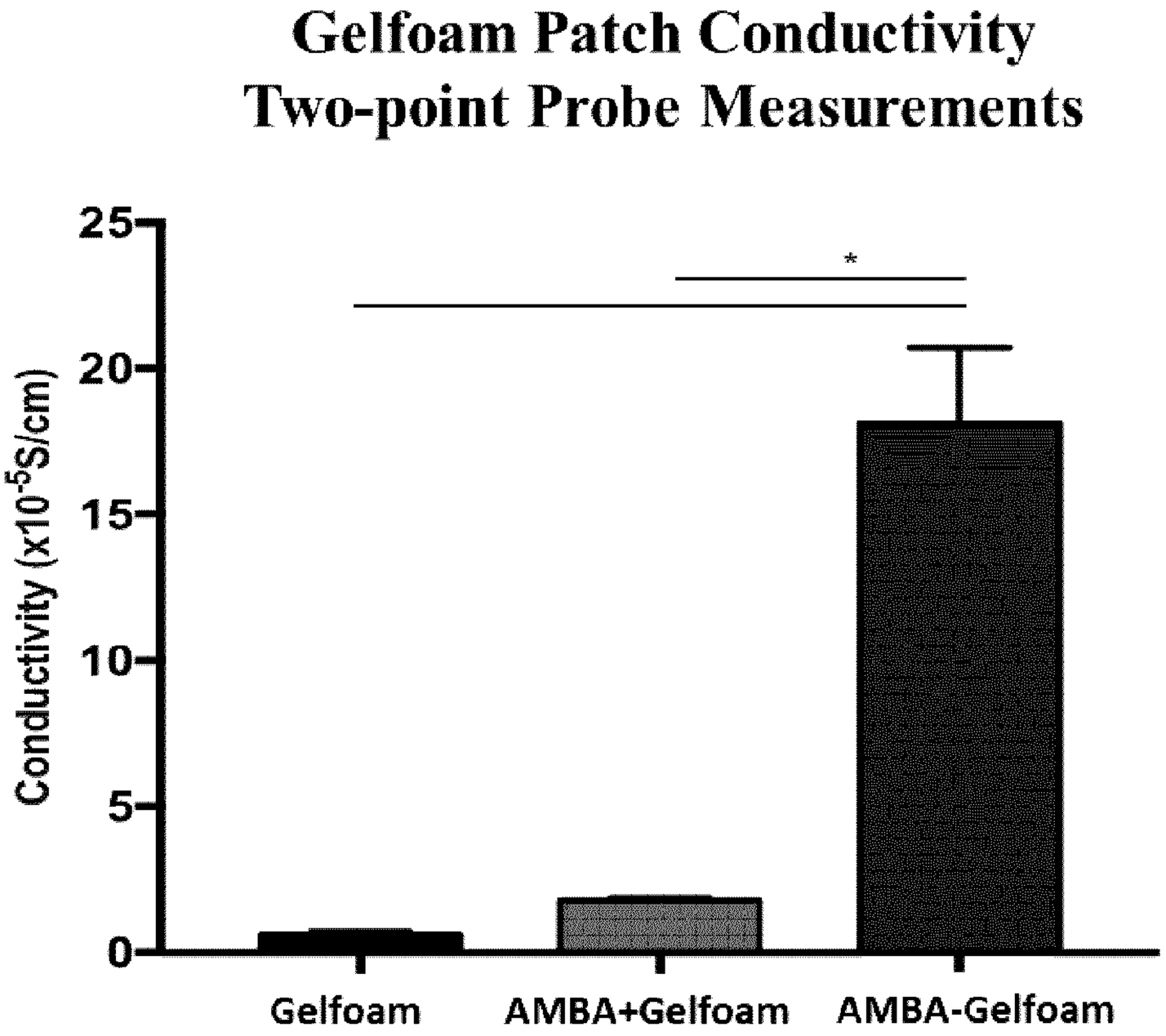
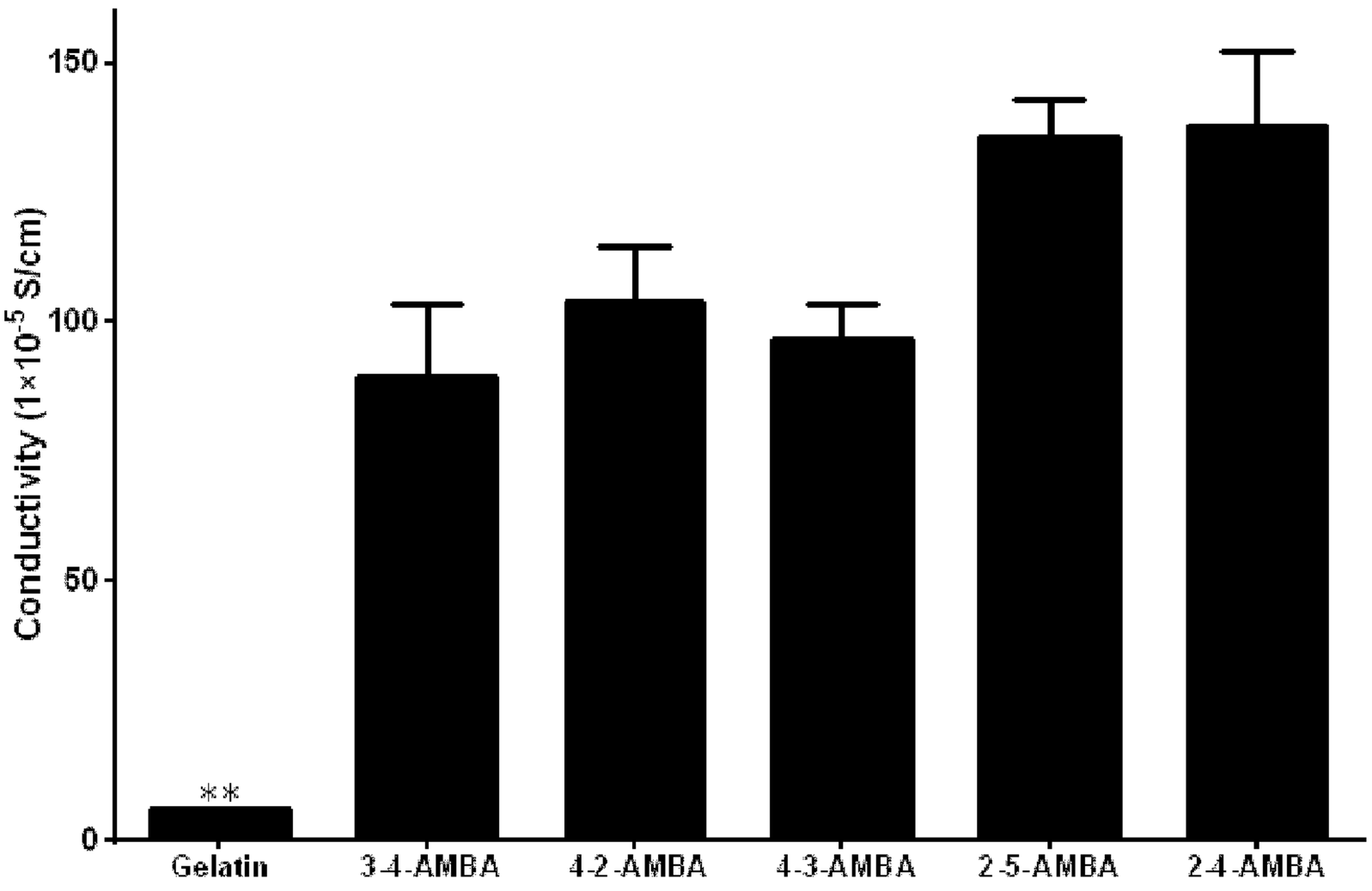

Gelfoam Patch Conductivity
Two-point Probe Measurements
Conductivity (x10-5S/cm)
25
20
15
10
5
0
*
Gelfoam
AMBA+Gelfoam
AMBA-Gelfoam

Fig. 3


150
100
50
0
Conductivity (1×10-5 S/cm)
**
Gelatin
3-4-AMBA
4-2-AMBA
4-3-AMBA
2-5-AMBA
2-4-AMBA

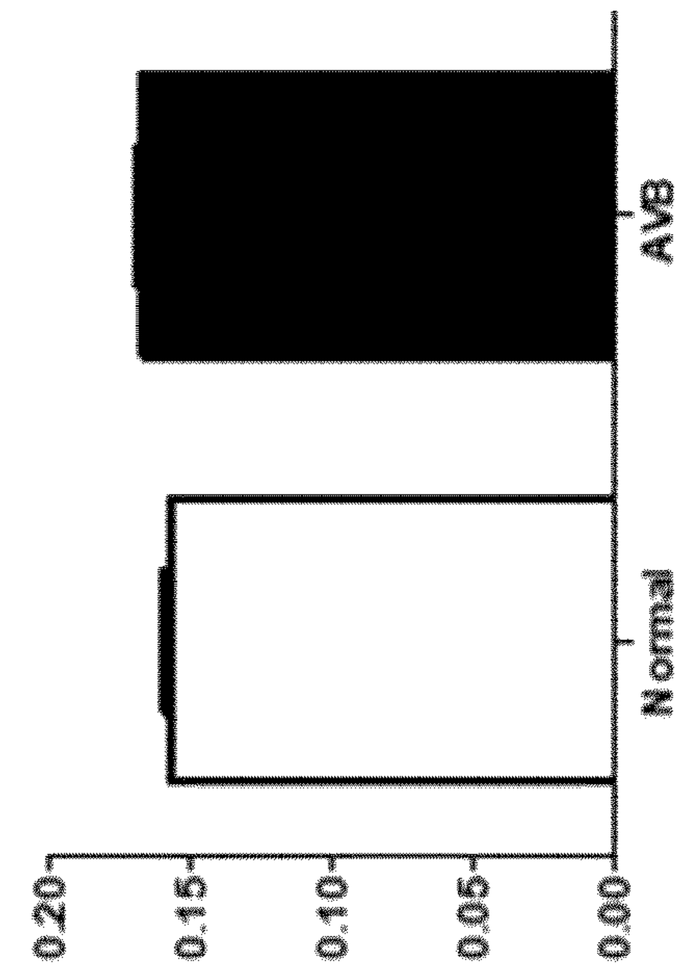


Fig. 4C

Fig. 4A

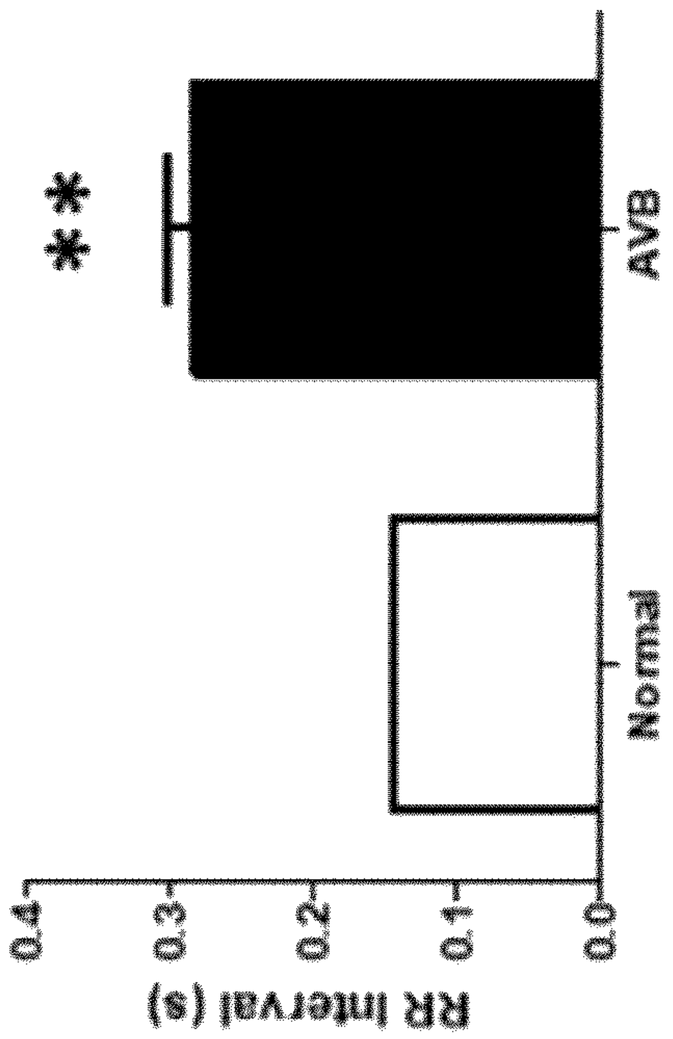


Fig. 4D

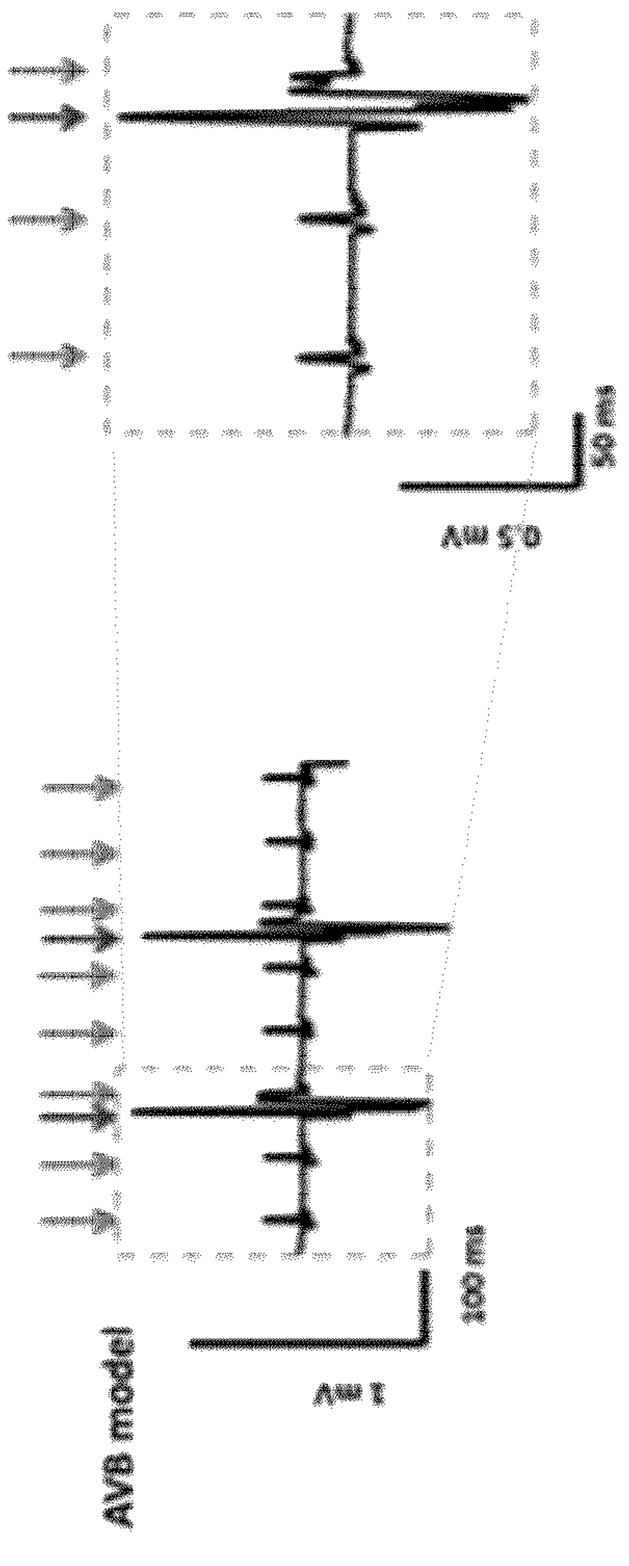


Fig. 4B

Fig. 5

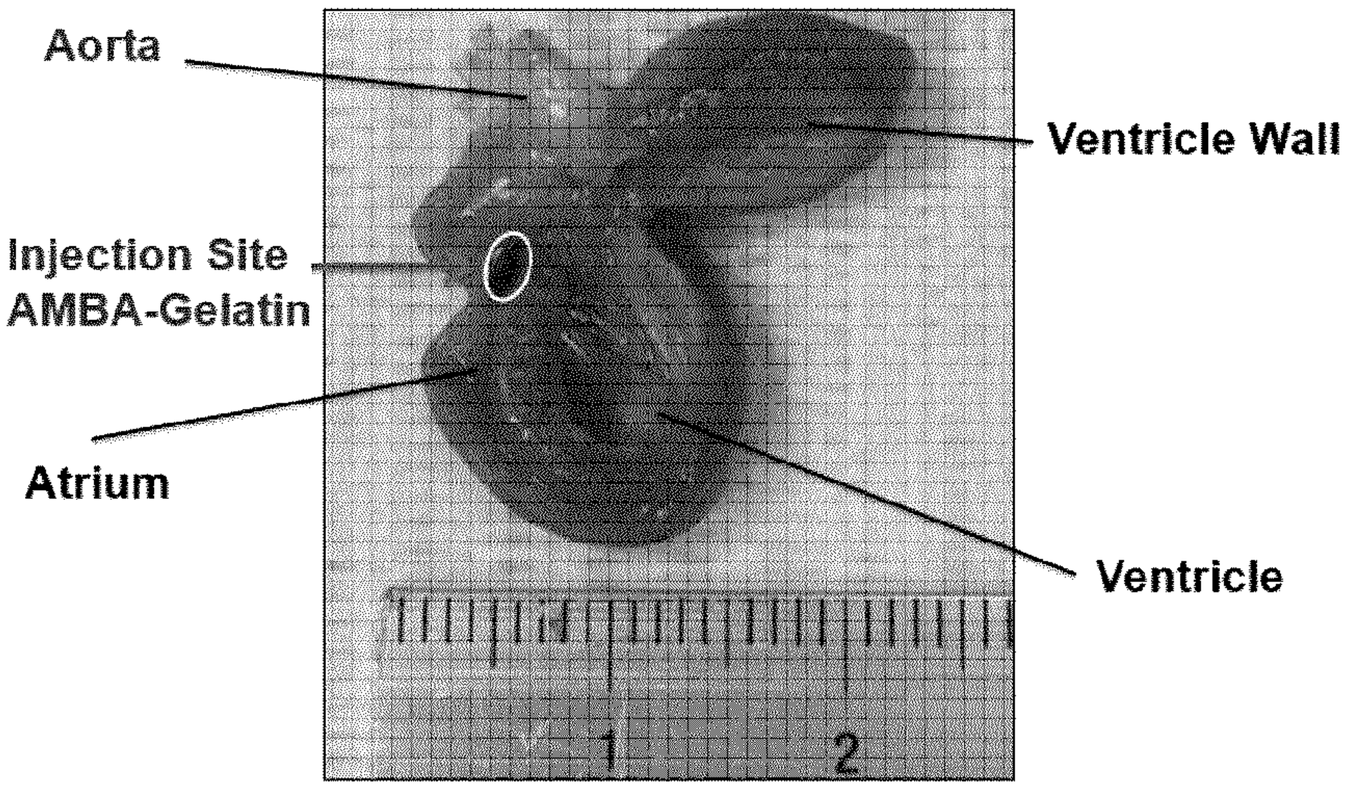


Fig. 6A

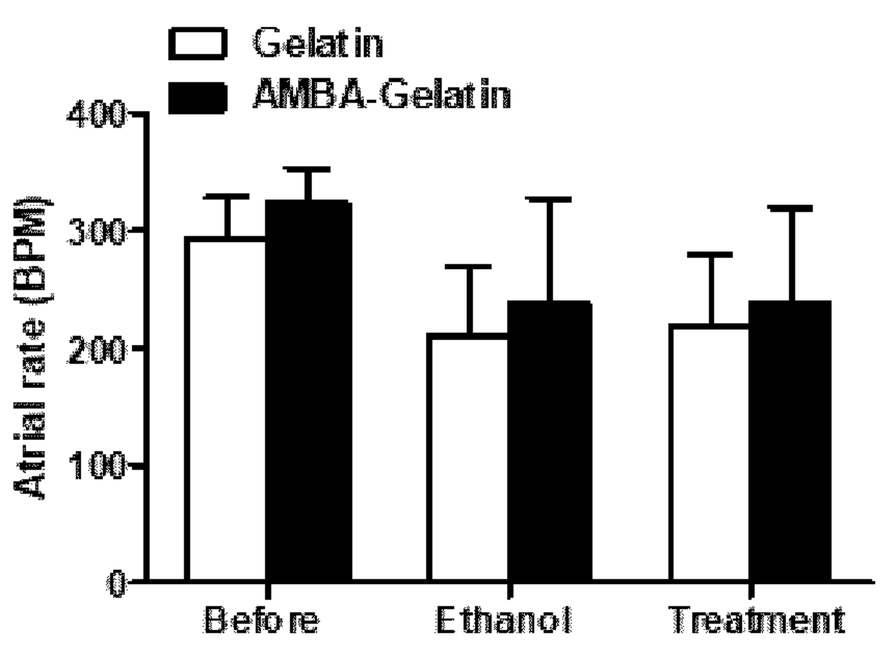


Fig. 6B

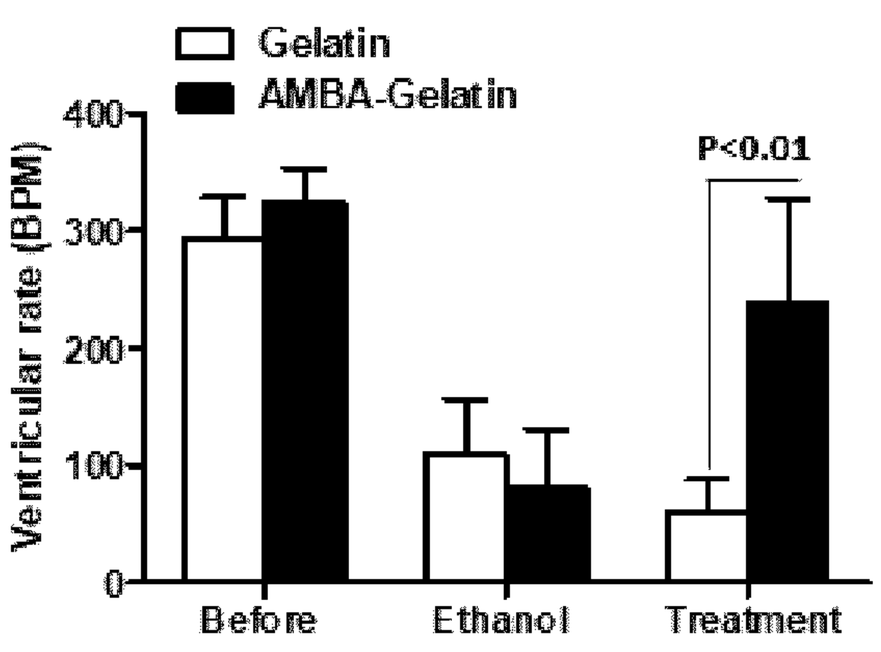


Fig. 7A

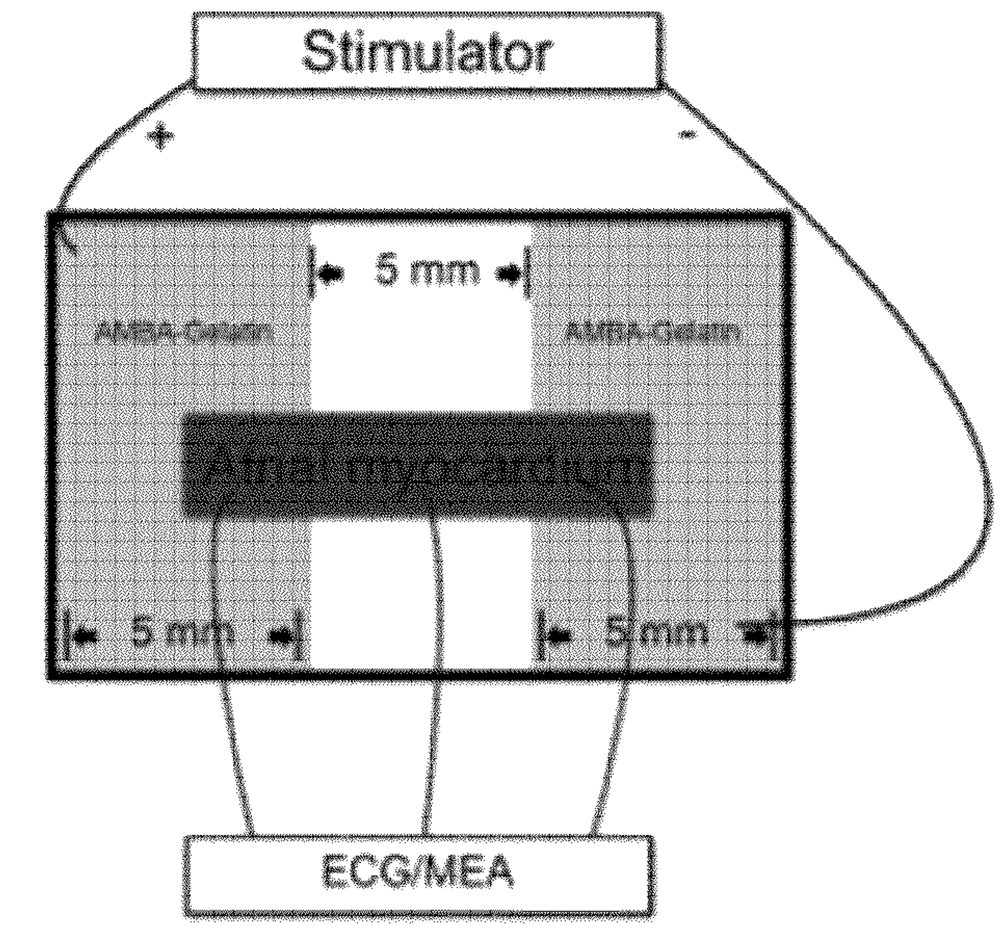

Stimulator
+
-
5 mm
AMBA-Gelatin
AMBA-Gelatin
Atrial myocardium
5 mm
5 mm
ECG/MEA

Fig. 7B

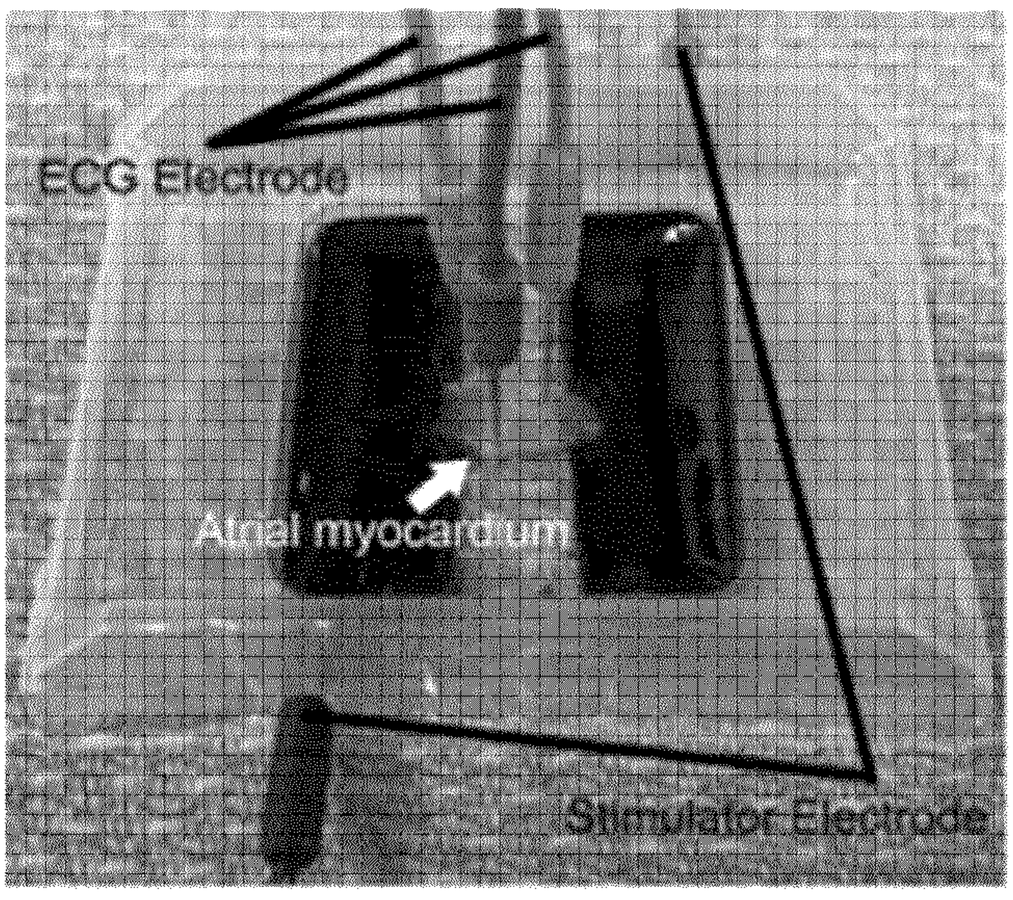

ECG Electrode
Atrial myocardium
Stimulator Electrode

Fig. 7C

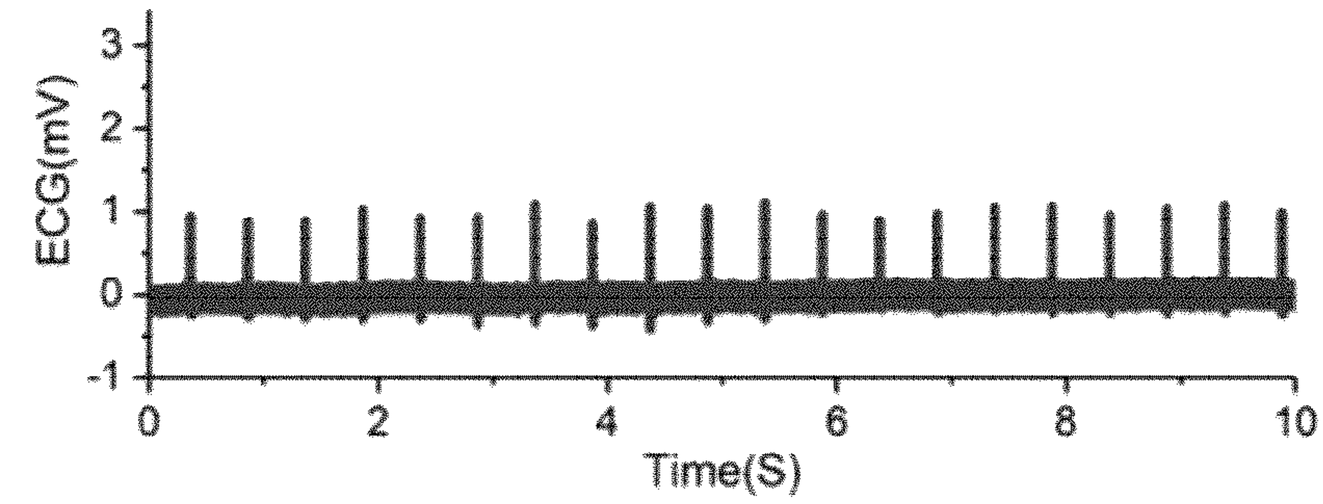


Fig. 7D

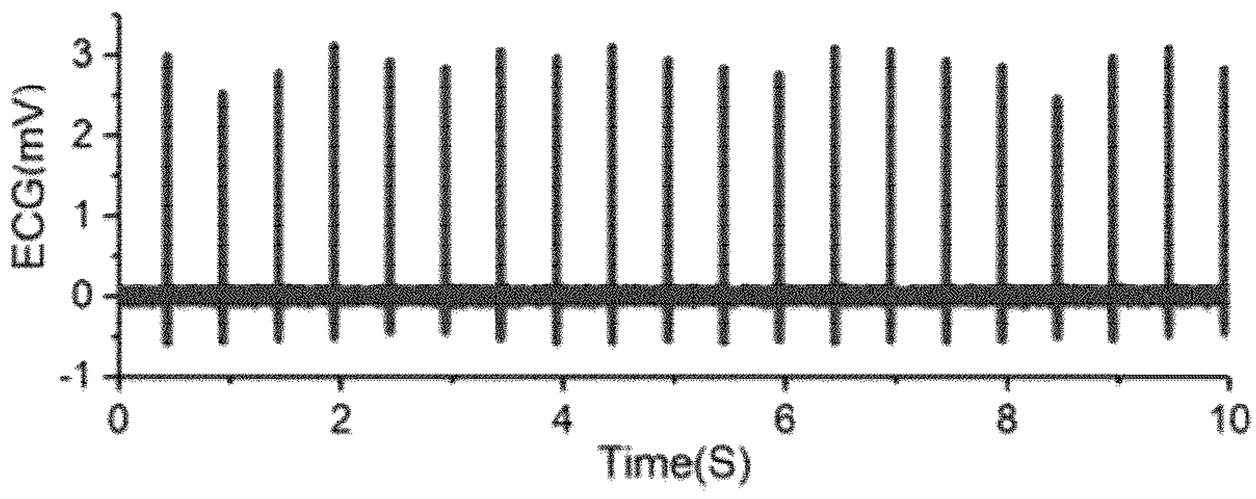


Fig. 7E

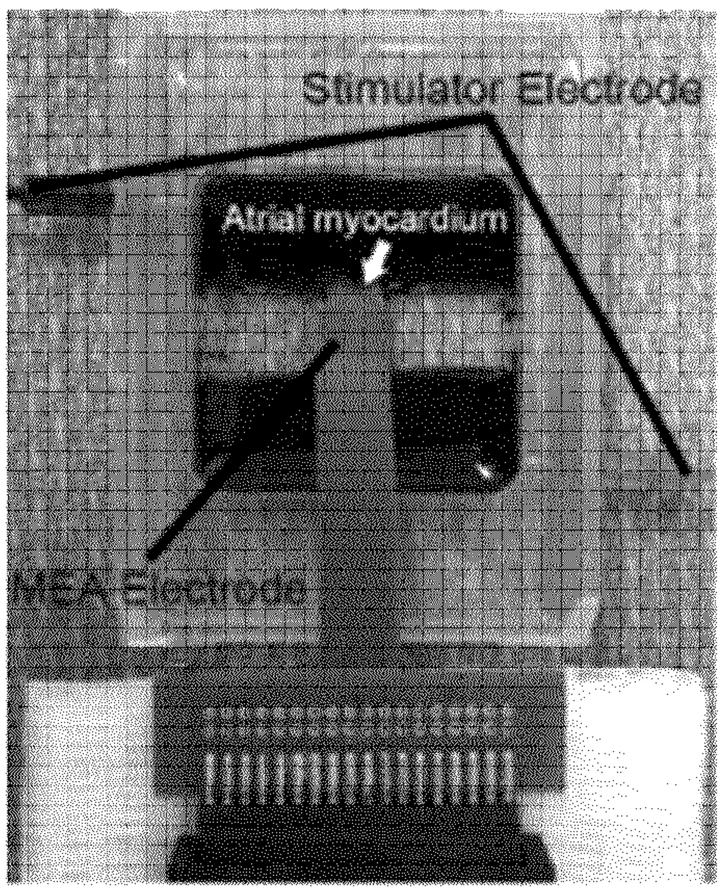


Fig. 7F

Gelatin

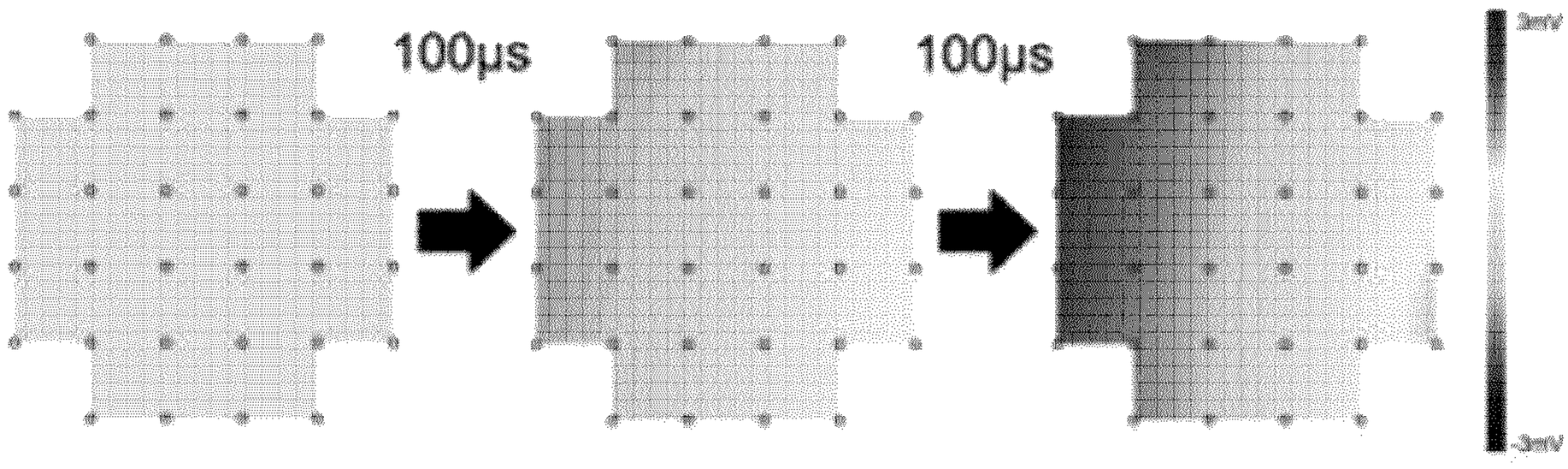


Fig. 7G

AMBA-Gelatin

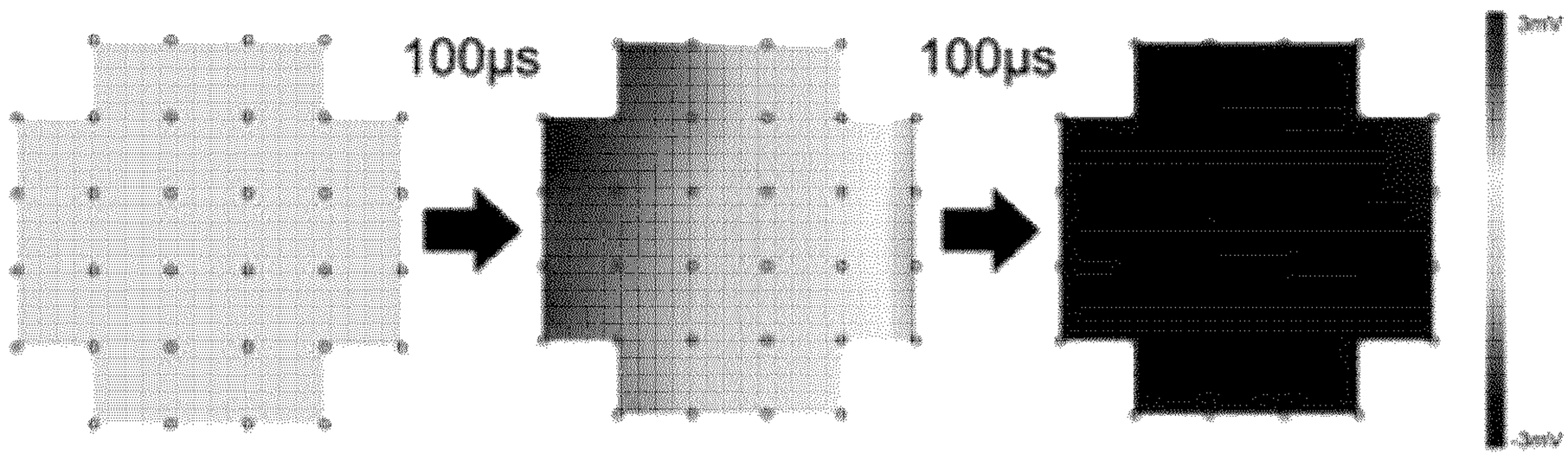


Fig. 7H

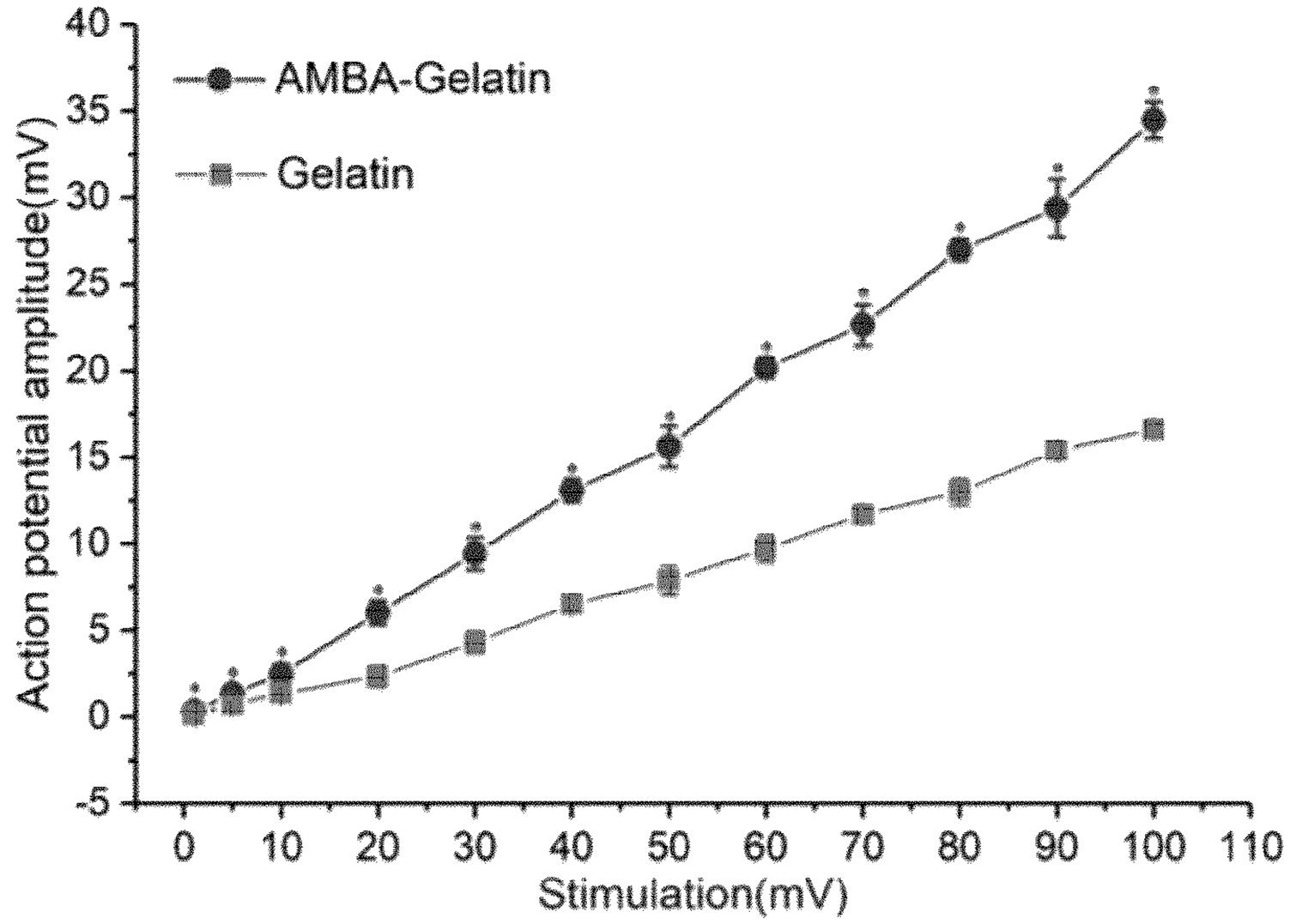

AMBA-Gelatin
Gelatin
Action potential amplitude(mV)
40
35
30
25
20
15
10
5
0
-5
0
10
20
30
40
50
60
70
80
90
100
110
Stimulation(mV)

Fig. 7I

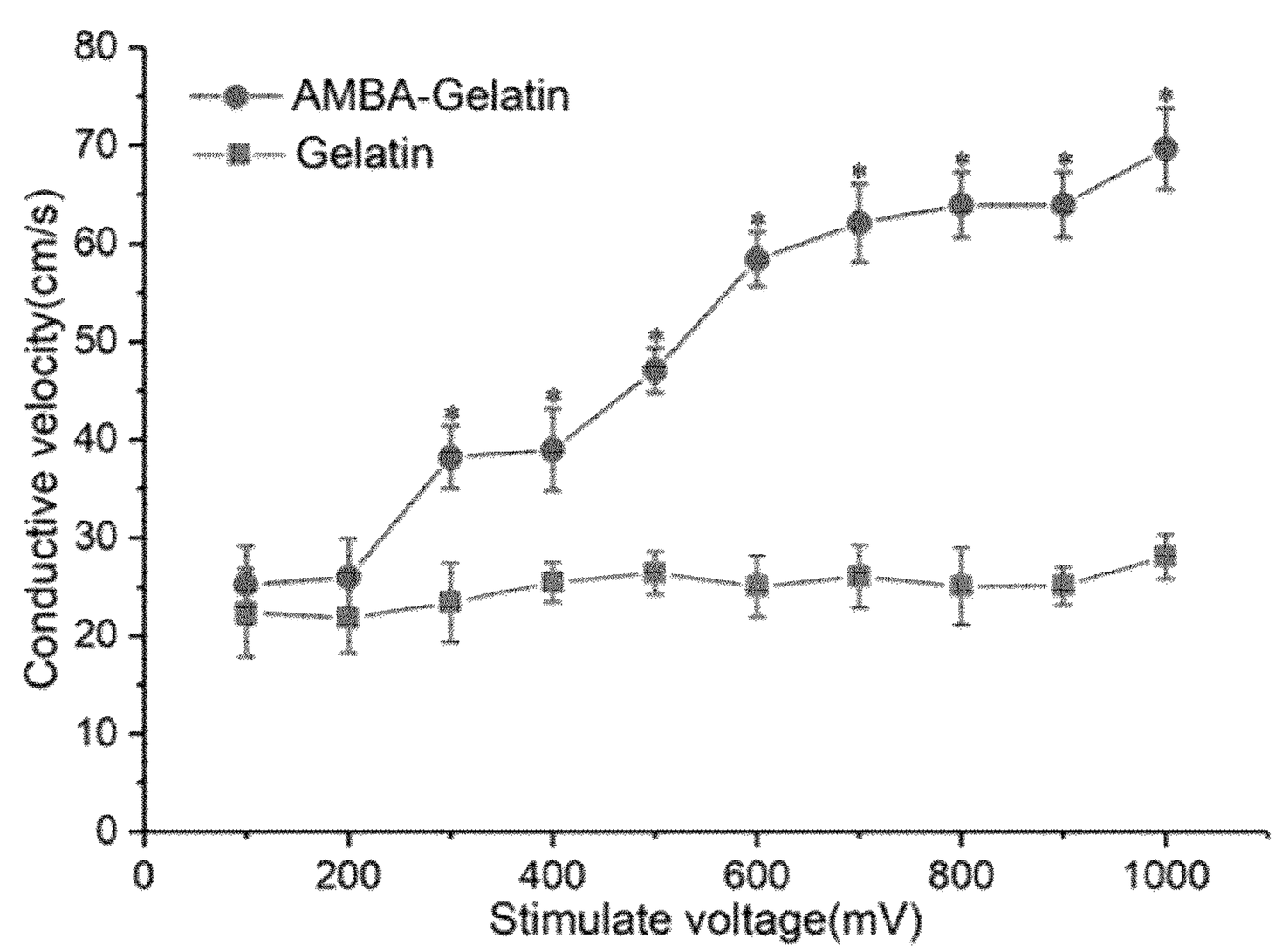

AMBA-Gelatin
Gelatin
Conductive velocity(cm/s)
80
70
60
50
40
30
20
10
0
0
200
400
600
800
1000
Stimulate voltage(mV)

Fig. 8A

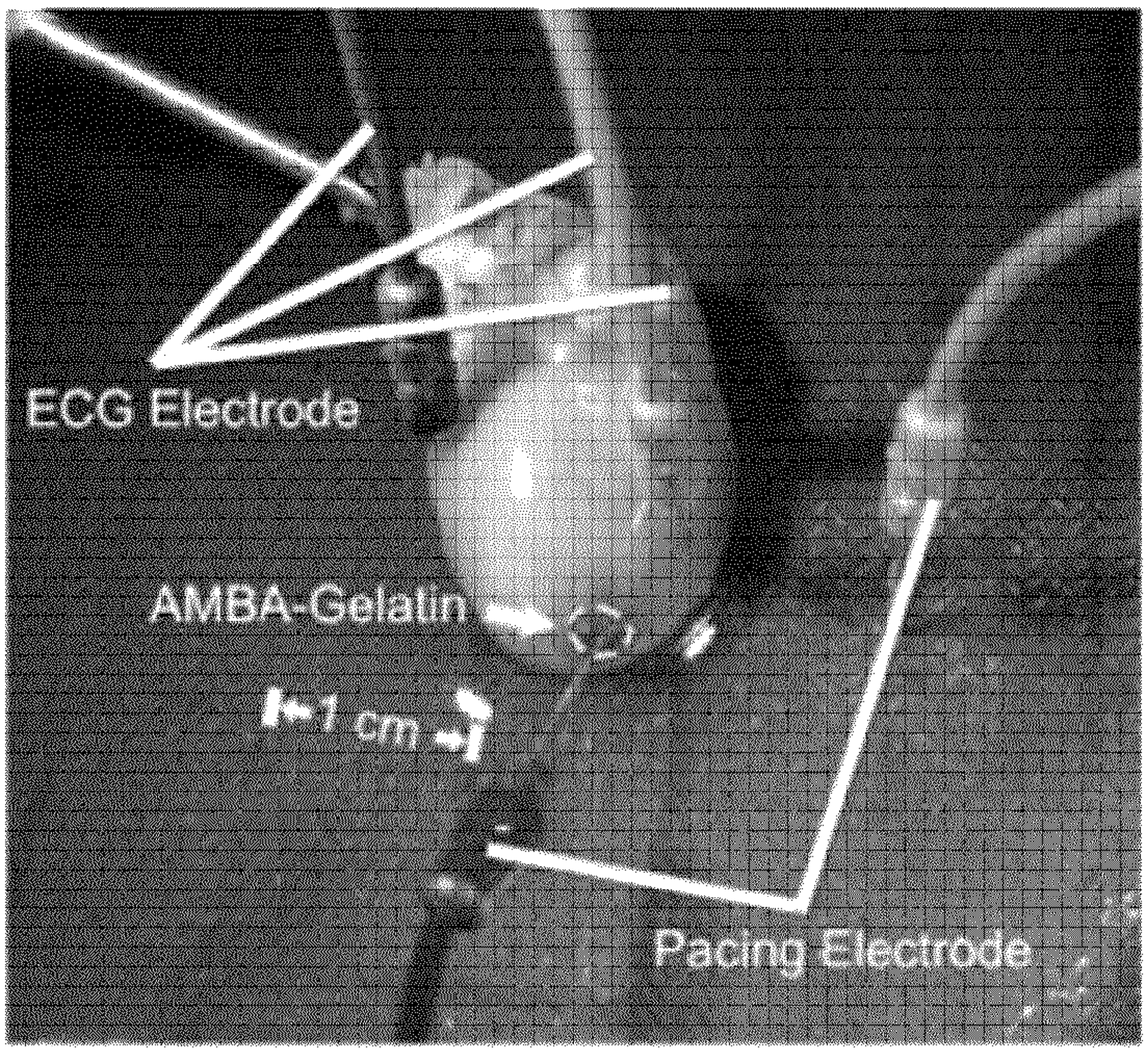
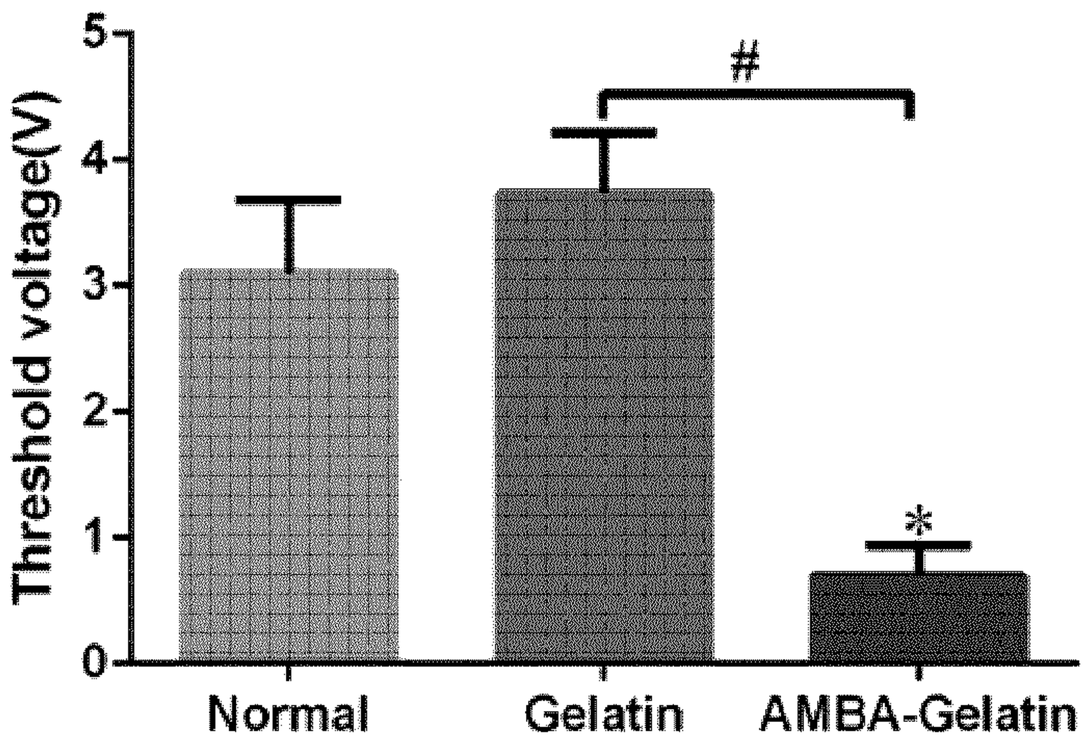

ECG Electrode
AMBA-Gelatin
1 cm
Pacing Electrode

Fig. 8B


Threshold voltage(V)
5
4
3
2
1
0
#
*
Normal
Gelatin
AMBA-Gelatin

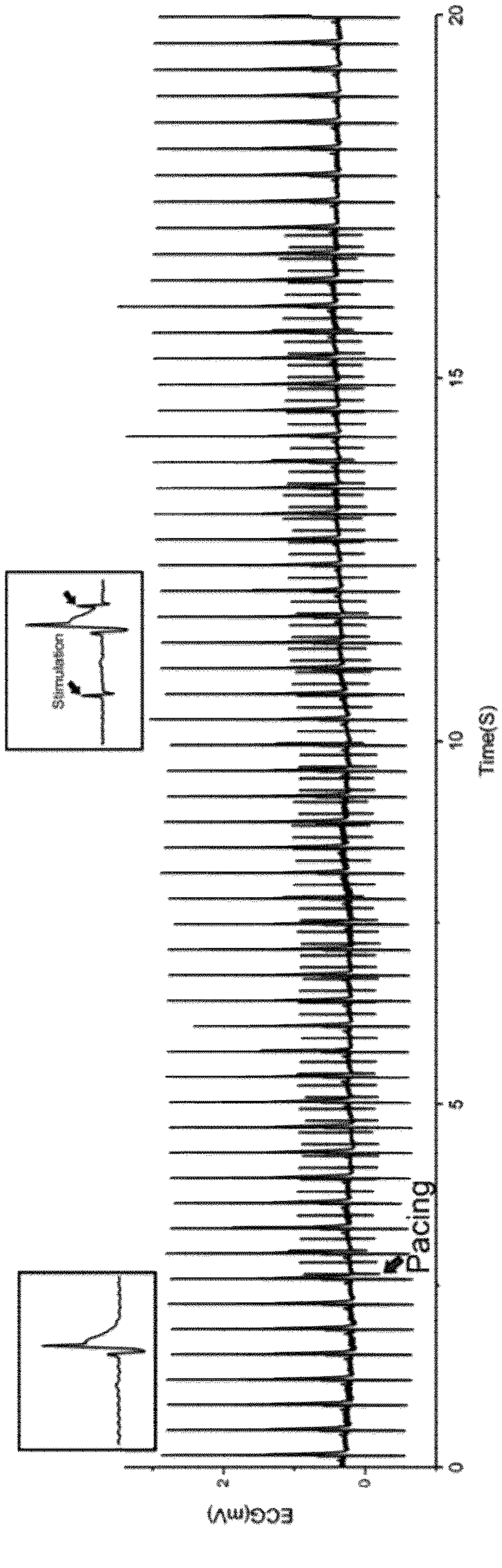


Fig. 8C

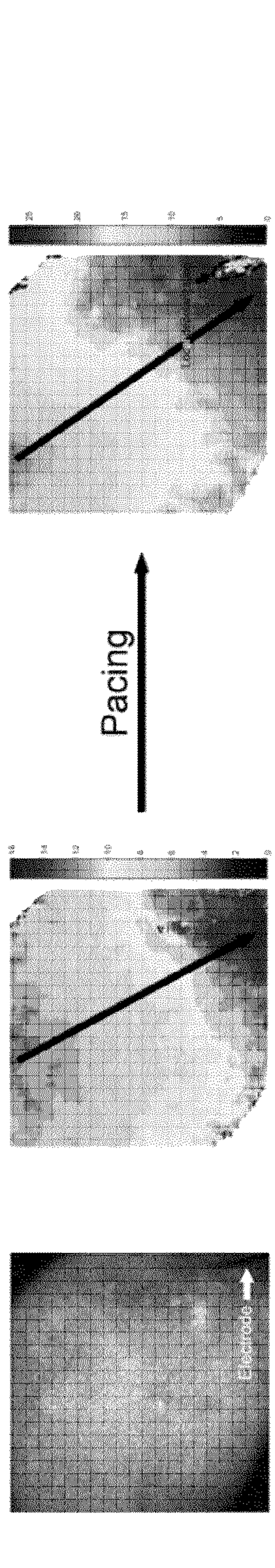


Fig. 8E

Fig. 8D

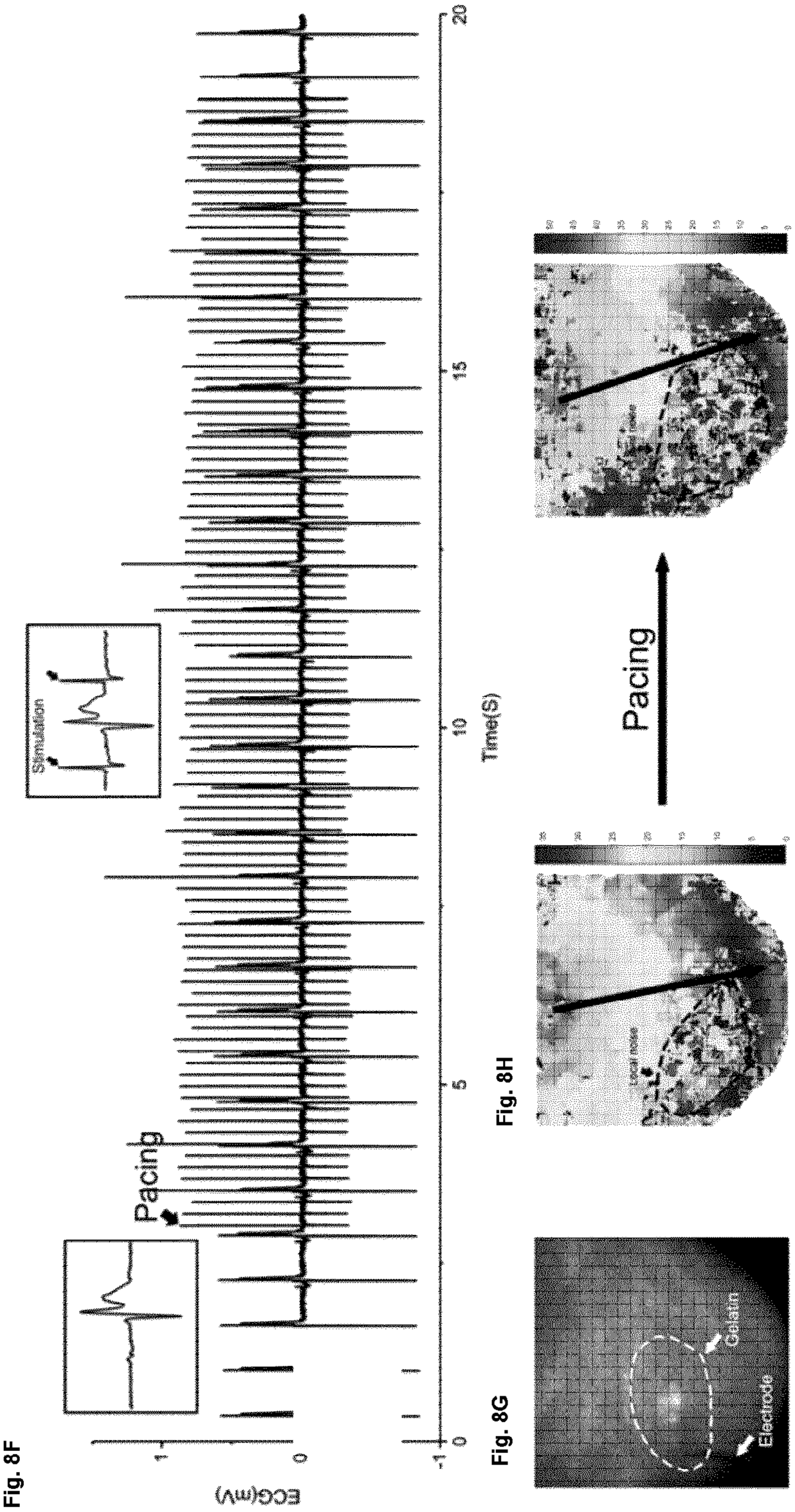


Fig. 8F

Fig. 8G

Fig. 8H

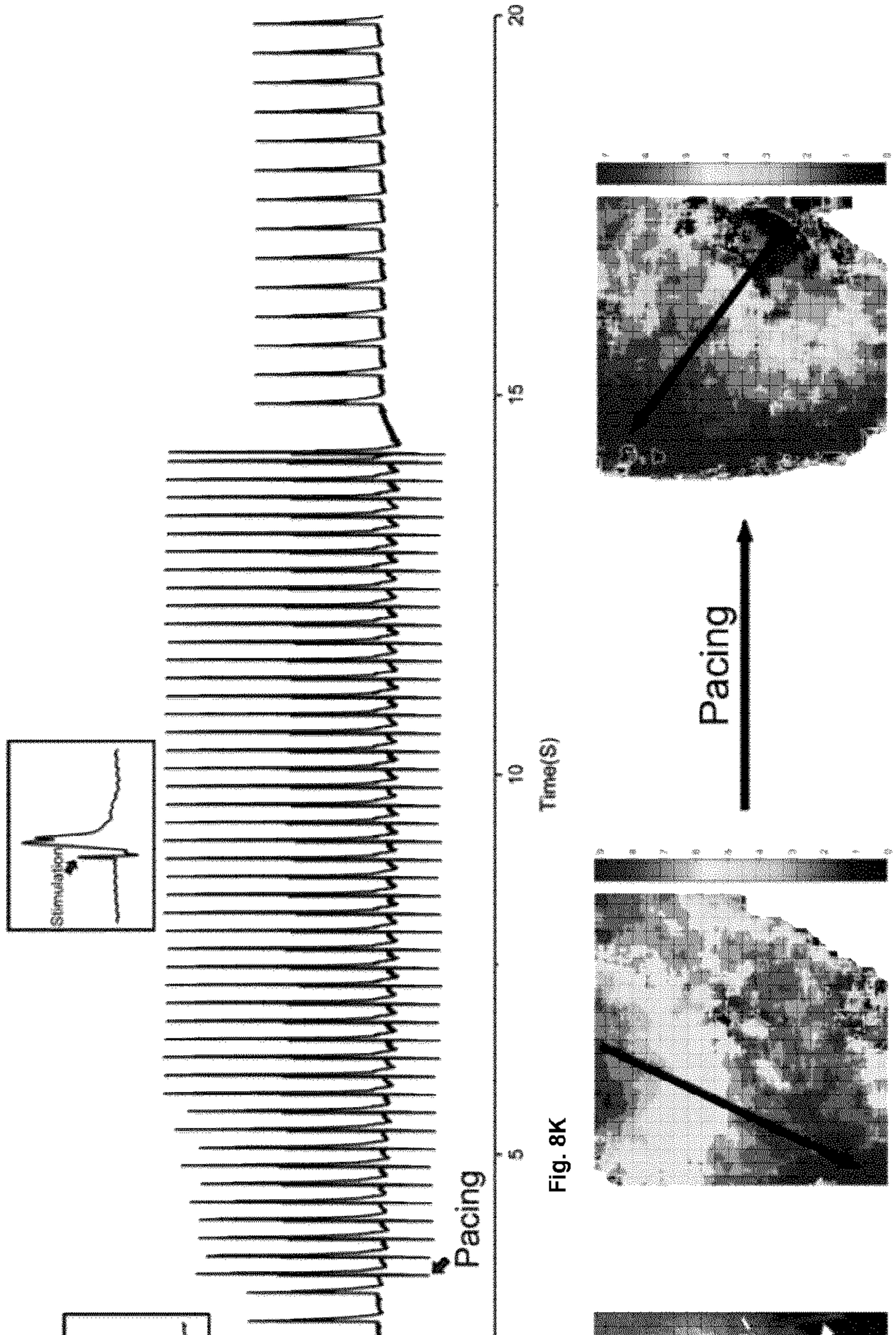


Fig. 8I

Fig. 8J

Fig. 8K

Fig. 9A

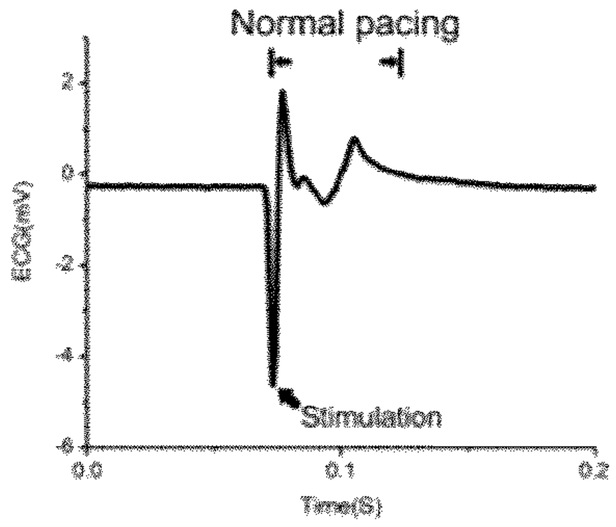


Fig. 9B

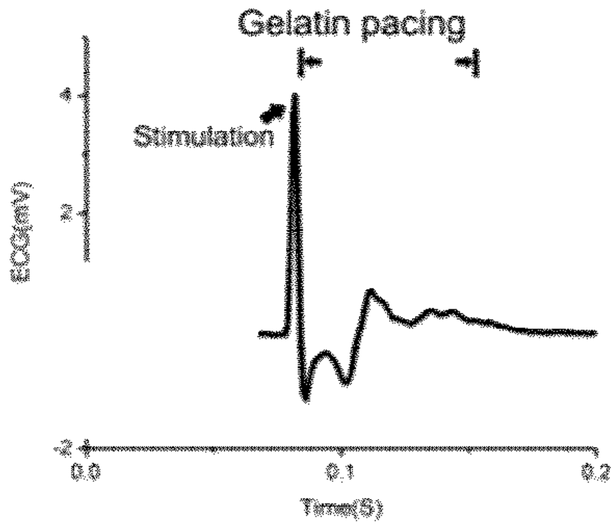


Fig. 9C

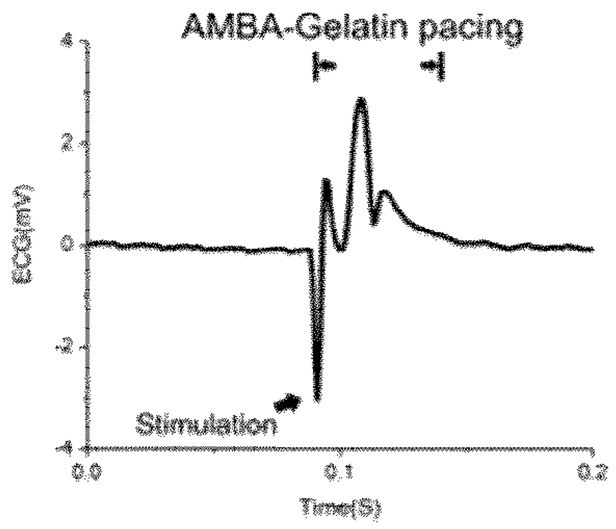


Fig. 9D

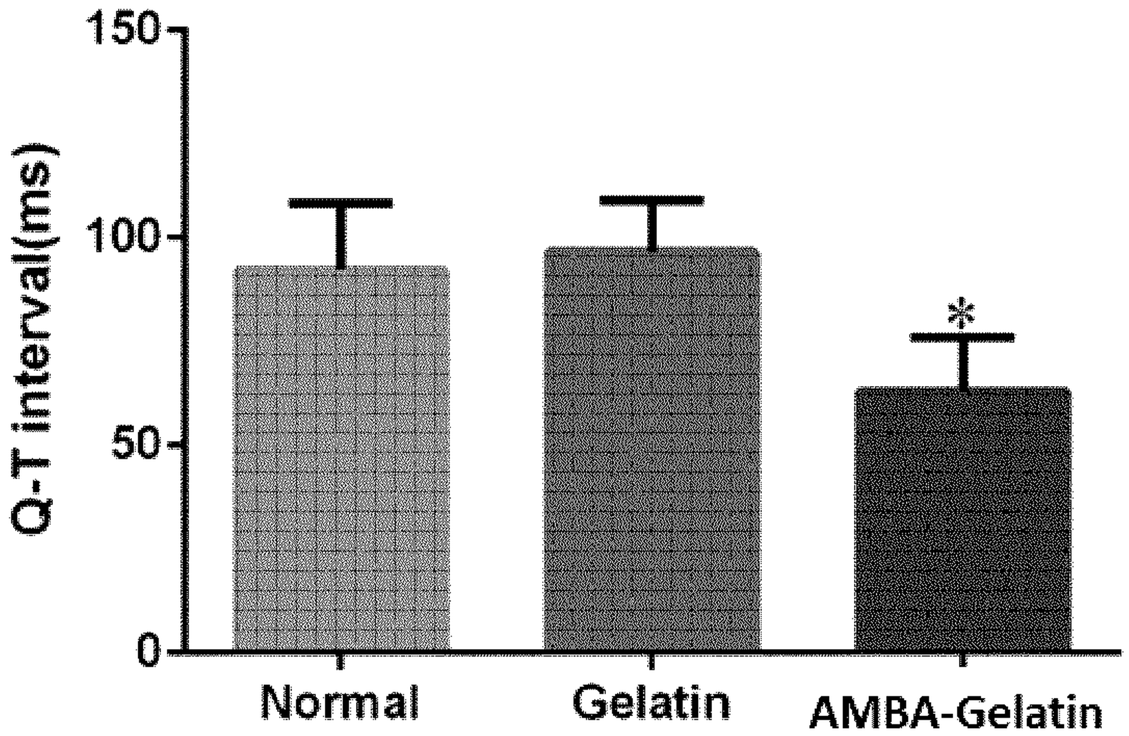


Fig. 9E

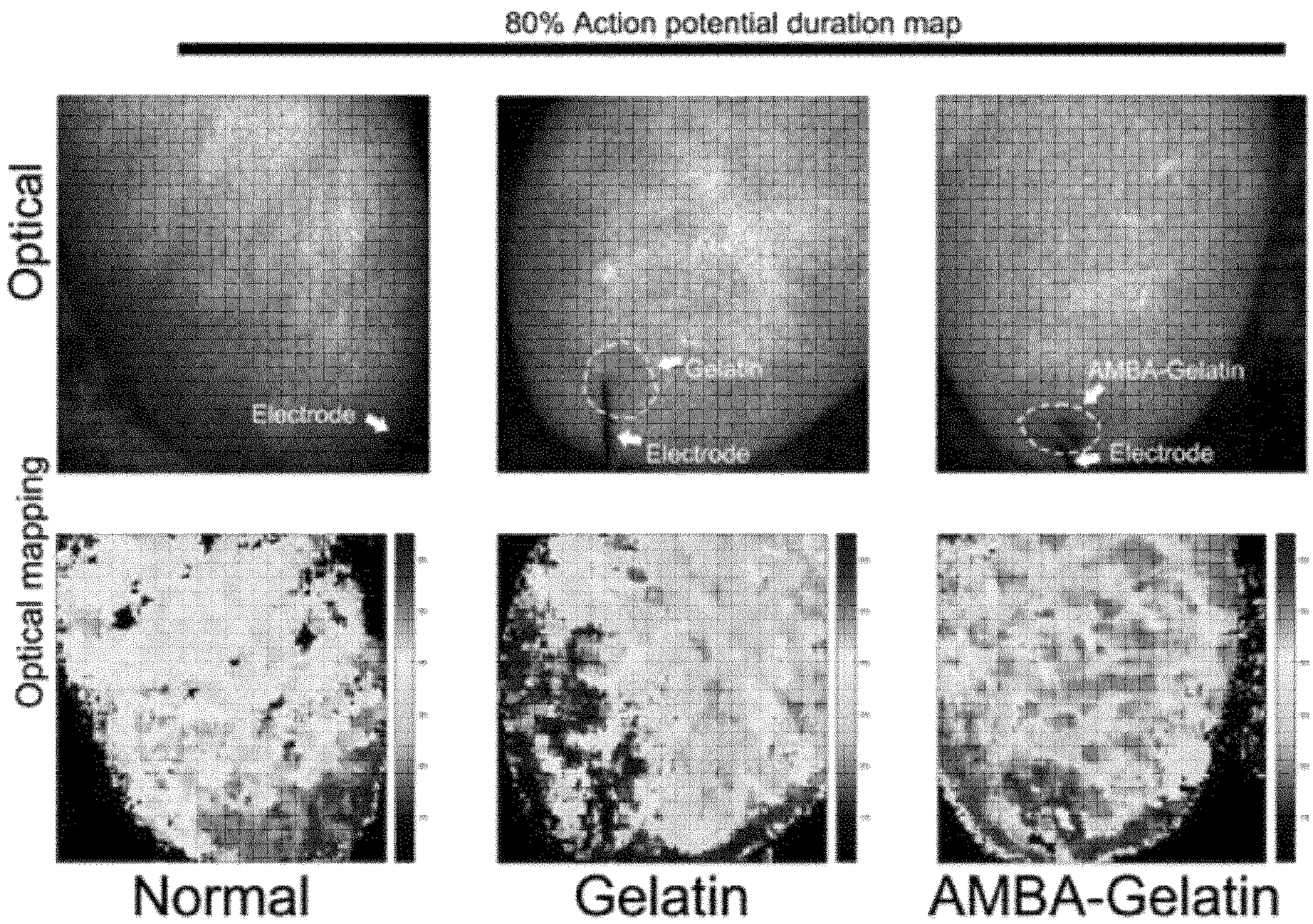

80% Action potential duration map
Optical
Optical mapping
Electrode
Gelatin
Electrode
AMBA-Gelatin
Electrode
Normal
Gelatin
AMBA-Gelatin

Fig. 9F

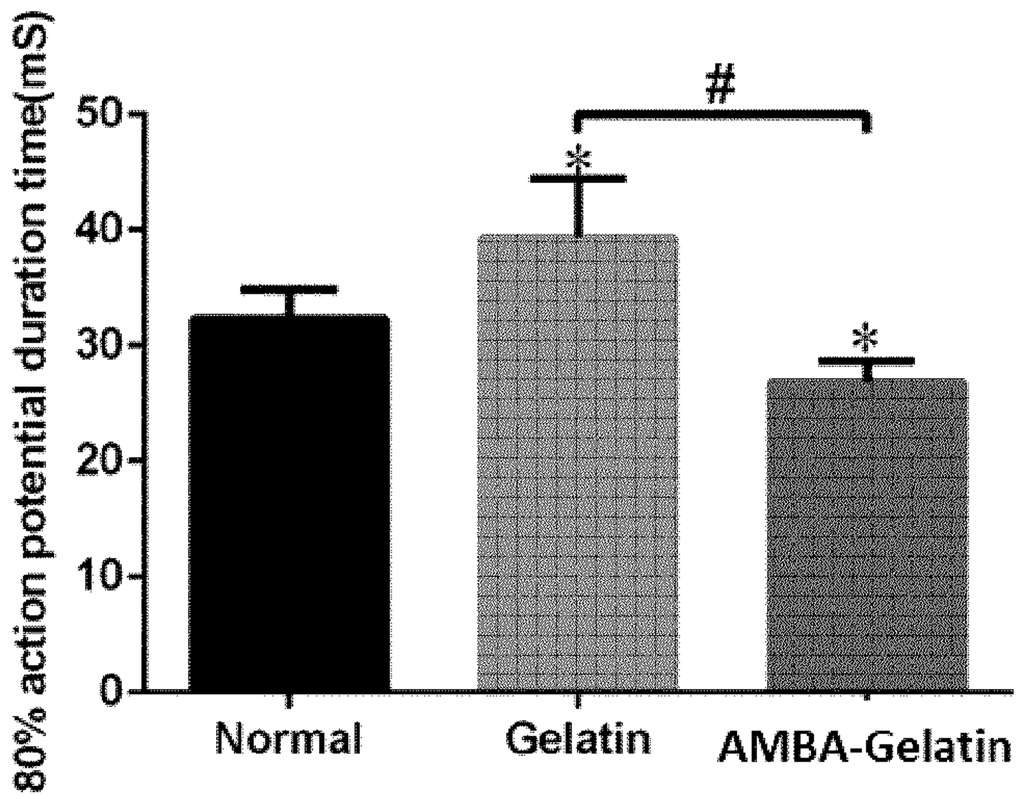

80% action potential duration time(mS)
50
40
30
20
10
0
#
*
*
Normal
Gelatin
AMBA-Gelatin

Fig. 9G

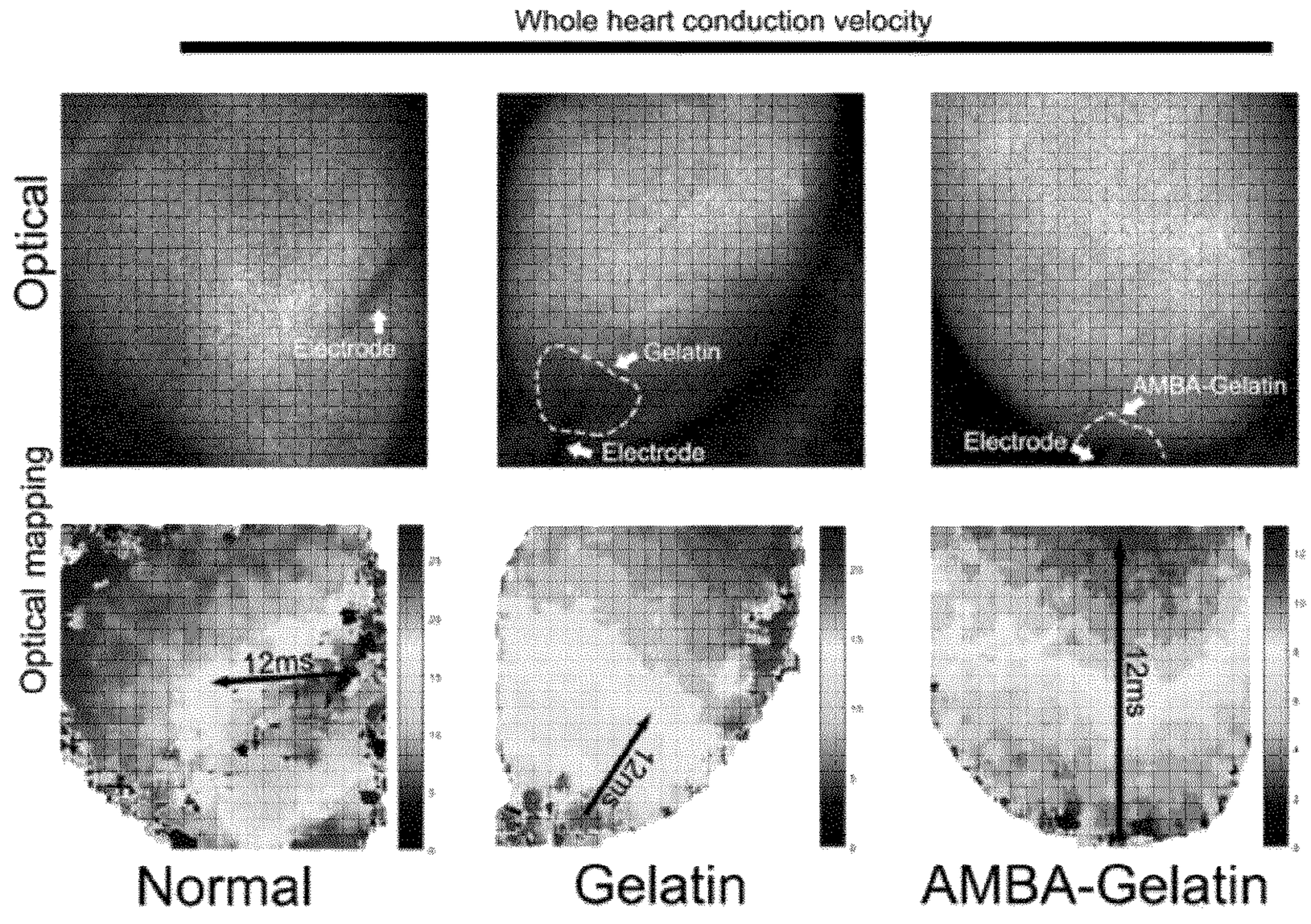

Whole heart conduction velocity
Optical
Electrode
Gelatin
Electrode
AMBA-Gelatin
Electrode
Optical mapping
12ms
12ms
12ms
Normal
Gelatin
AMBA-Gelatin

Fig. 9H

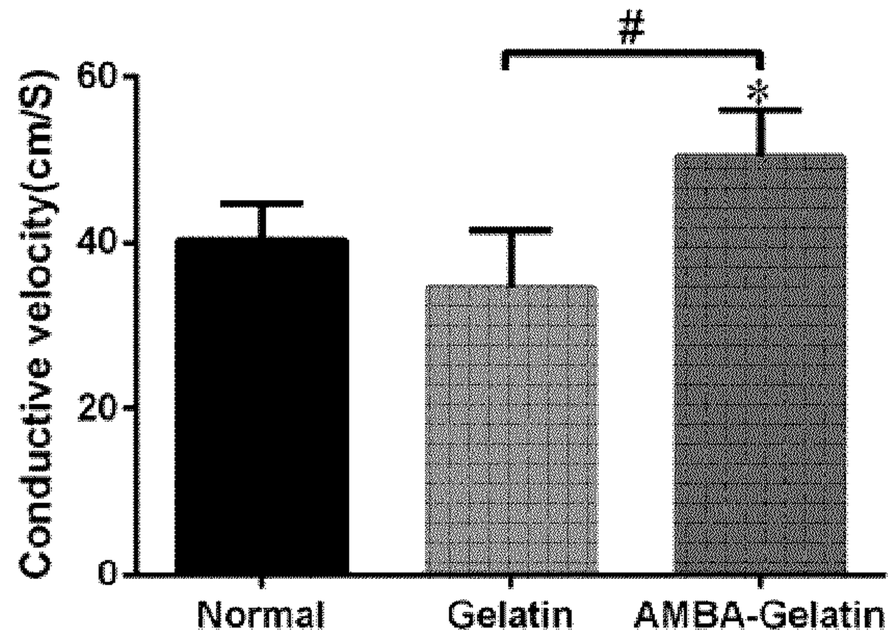

#
*
Conductive velocity(cm/S)
60
40
20
0
Normal
Gelatin
AMBA-Gelatin

Fig. 10A

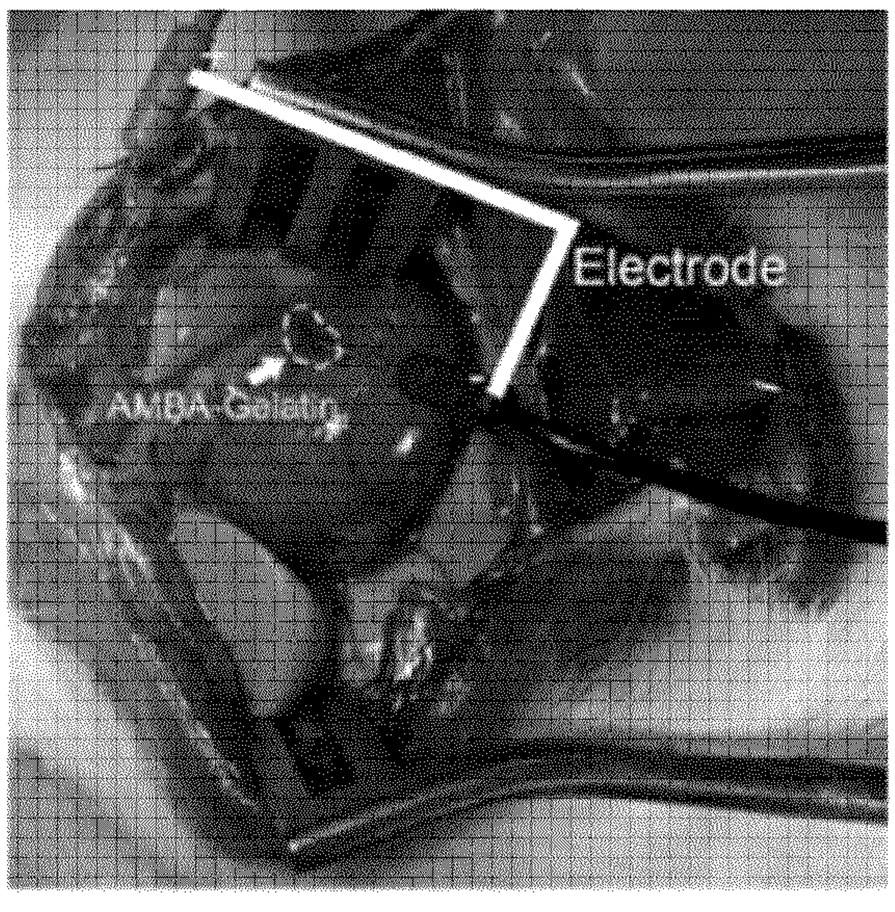
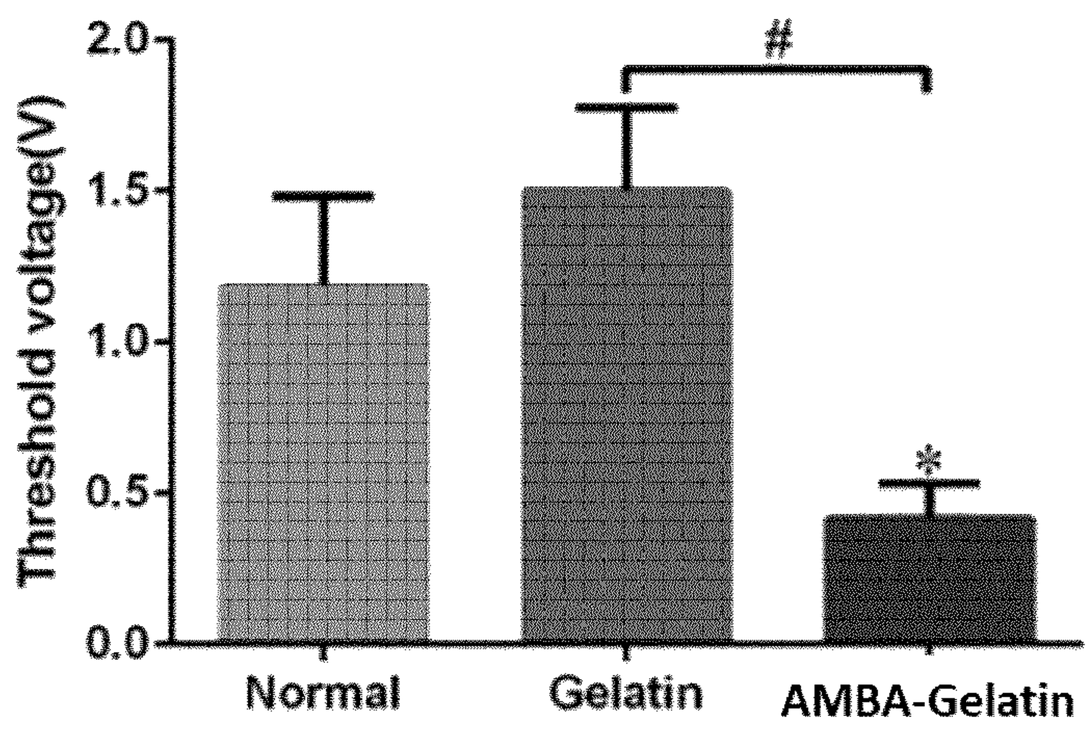


Fig. 10B



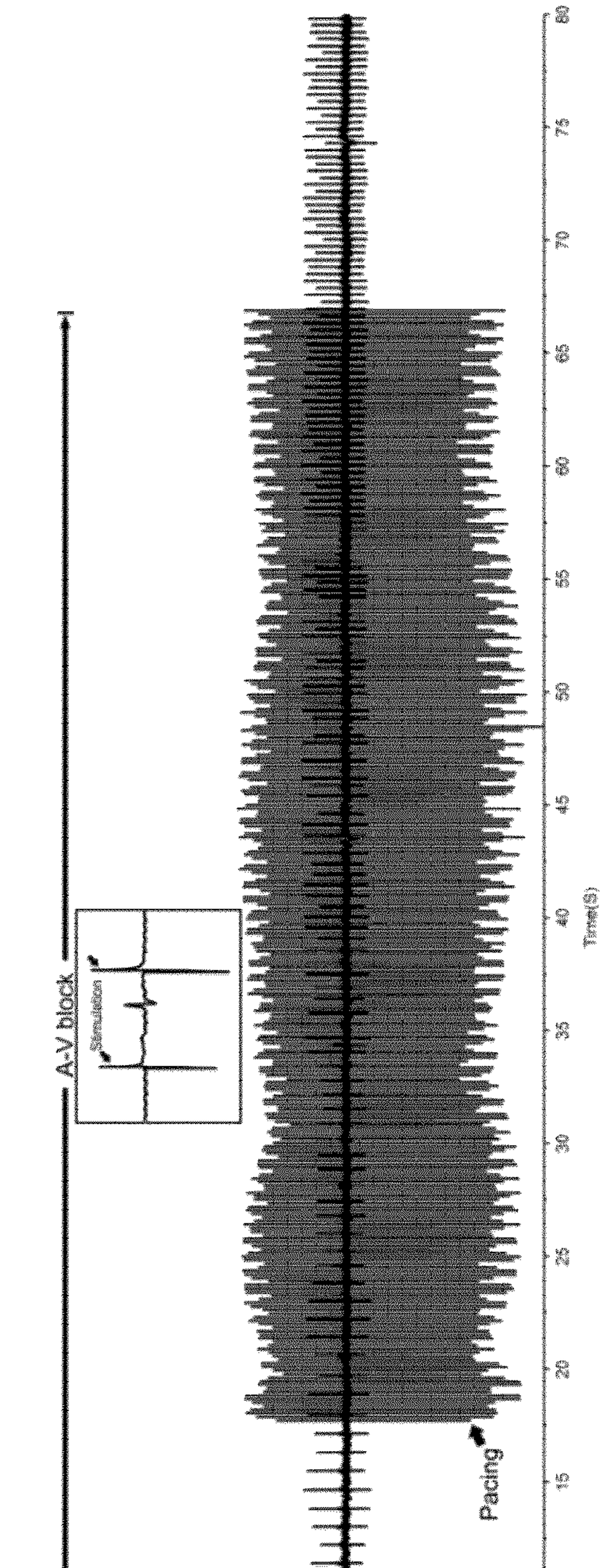


Fig. 10C

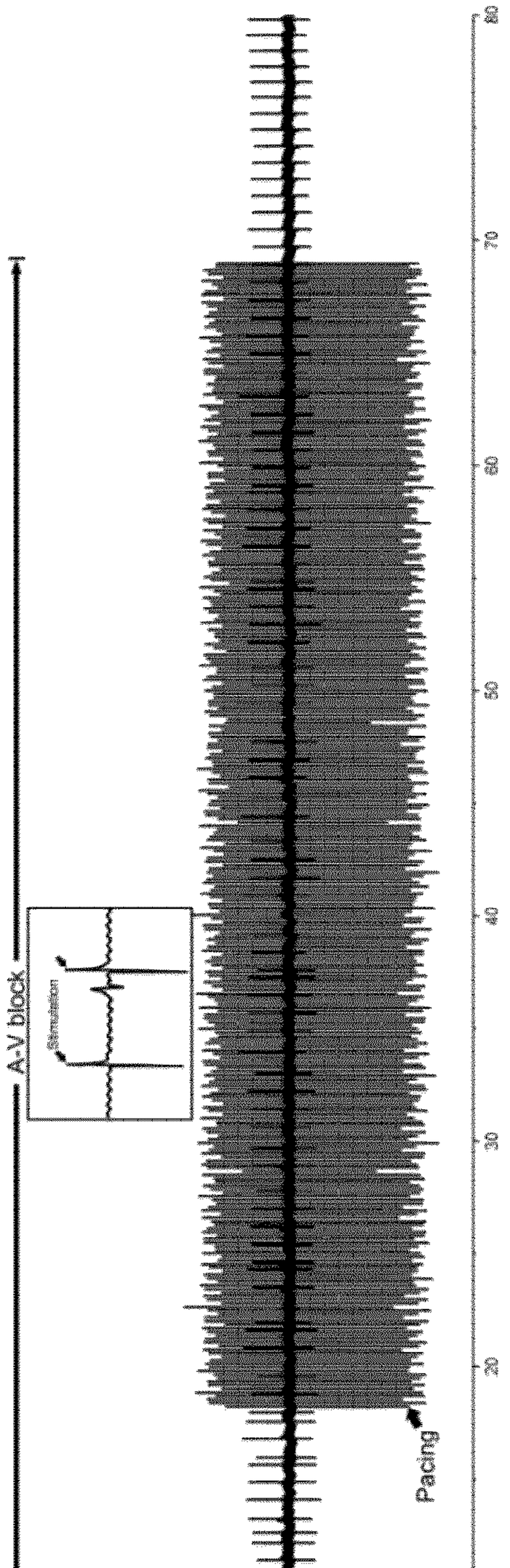


Fig. 10D

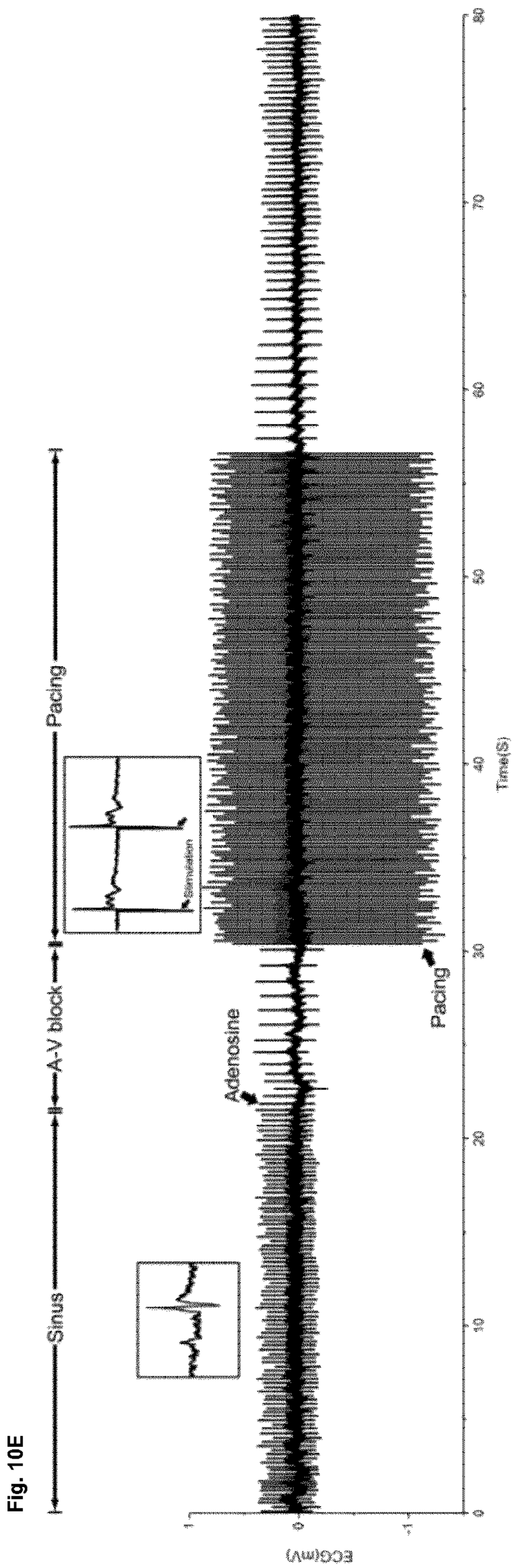

Sinus
A-V block
Pacing
Adenosine
Pacing
Stimulation
ECG(mV)
Time(S)
0
10
20
30
40
50
60

Fig. 10E

Fig. 10F

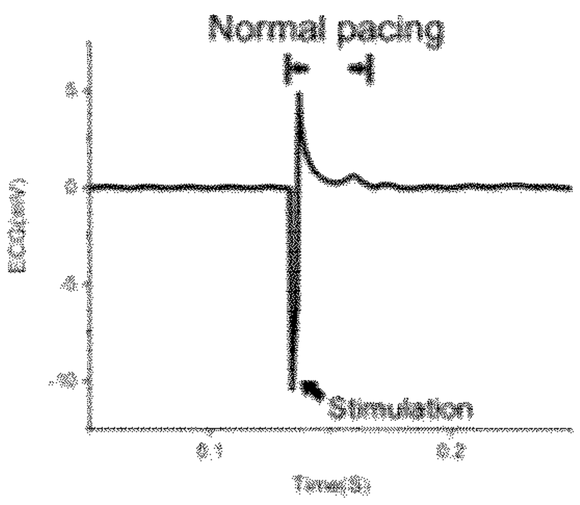


Fig. 10G

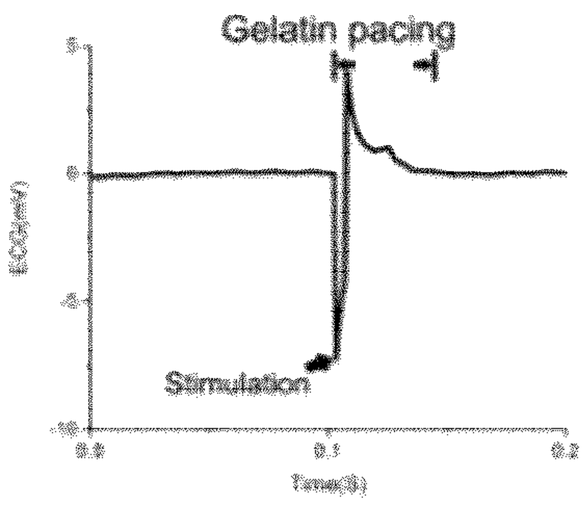


Fig. 10H

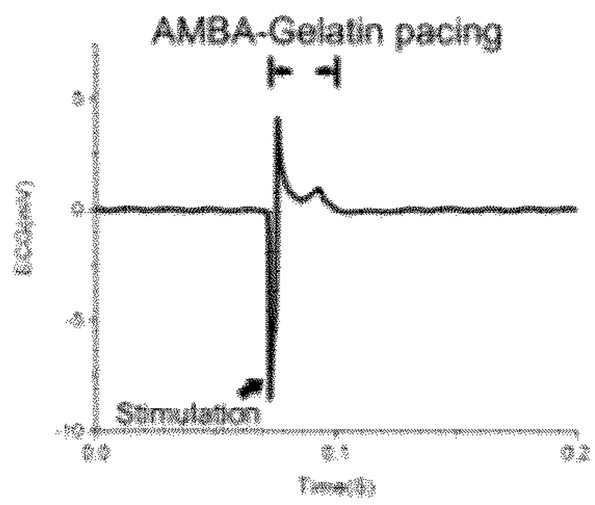
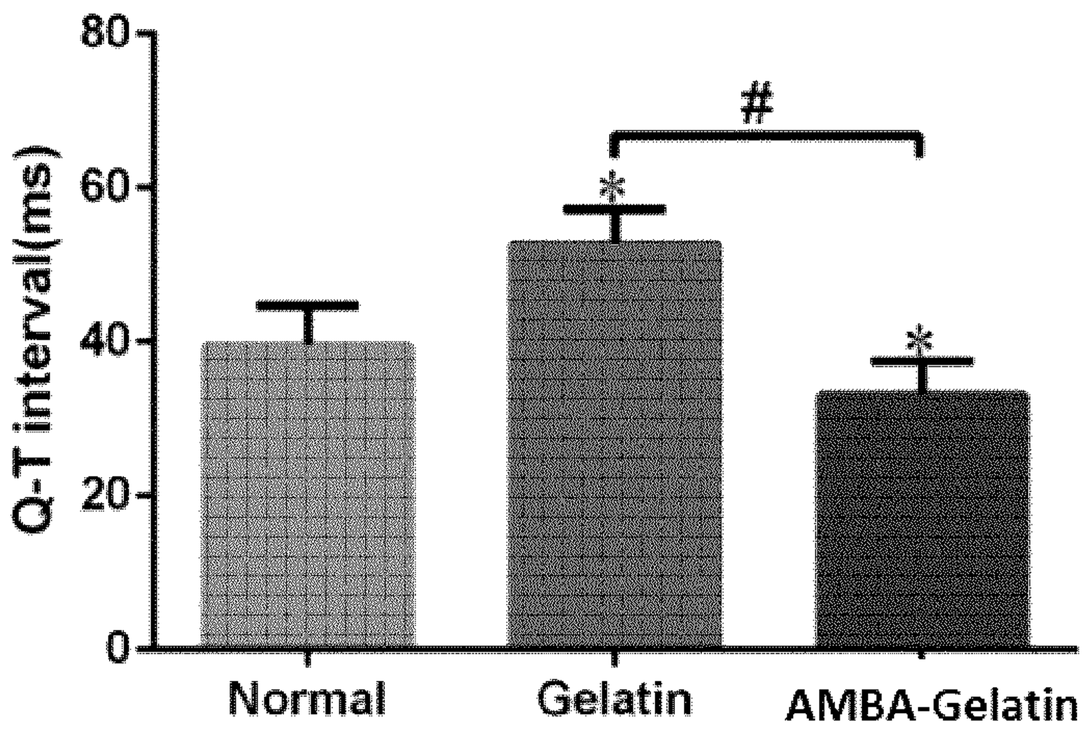


Fig. 10I



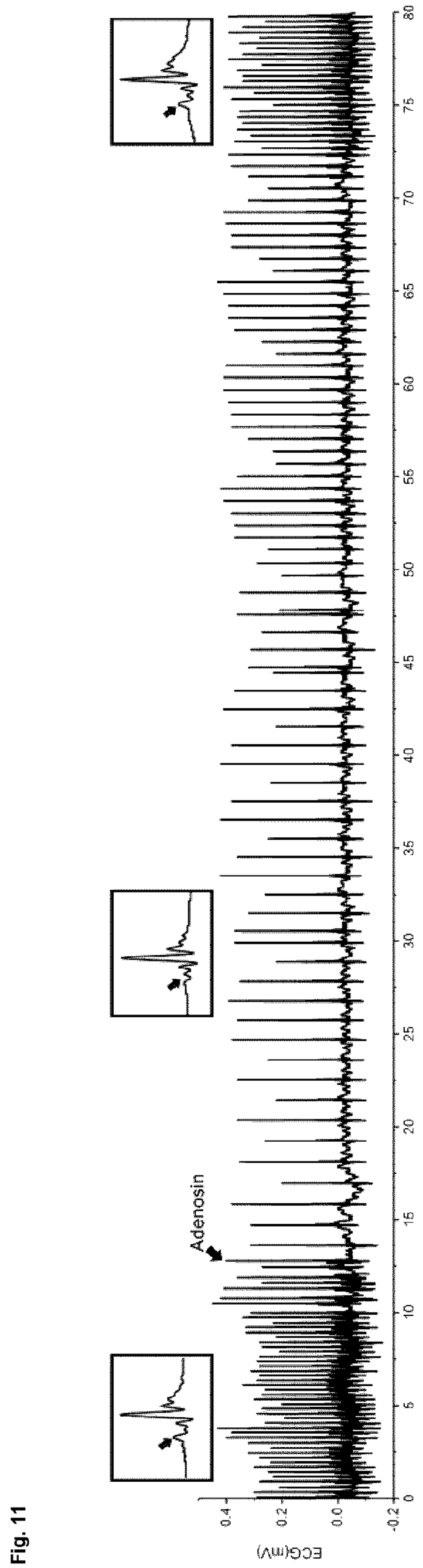

ECG(mV)
0.4
0.2
0.0
-0.2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
Time(S)
Adenosin

Fig. 11

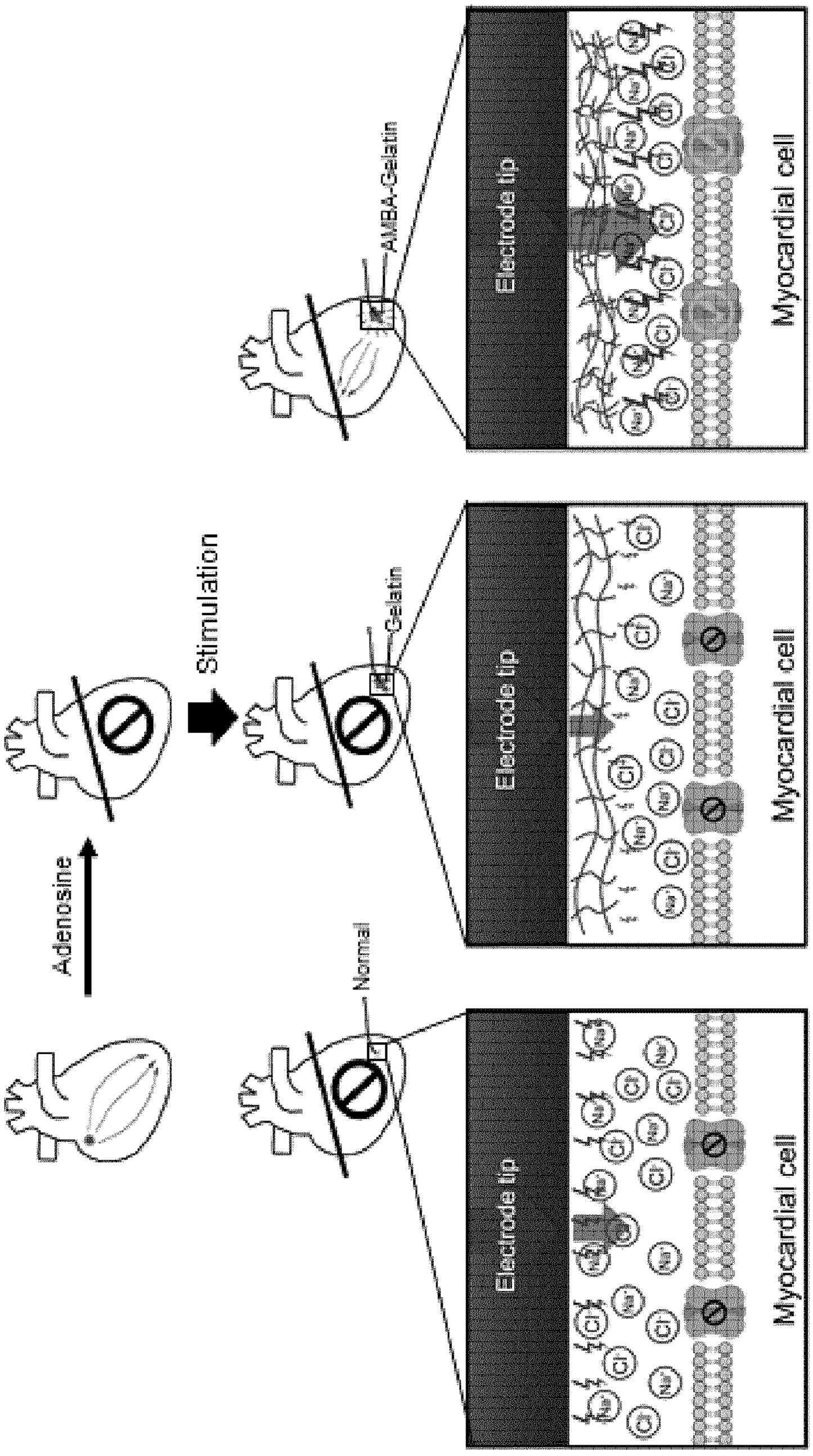

Adenosine
Stimulation
Normal
AMBA-Gelatin
Gelatin
Electrode tip
Myocardial cell
Ca2+
Na+

Fig. 12

Fig. 13A

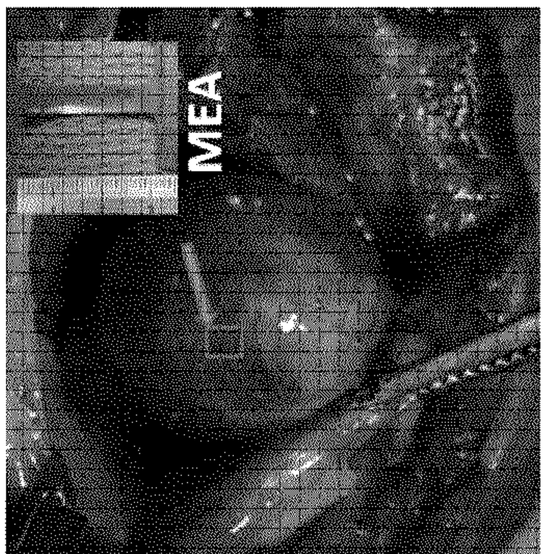


Fig. 13B

Fig. 13C

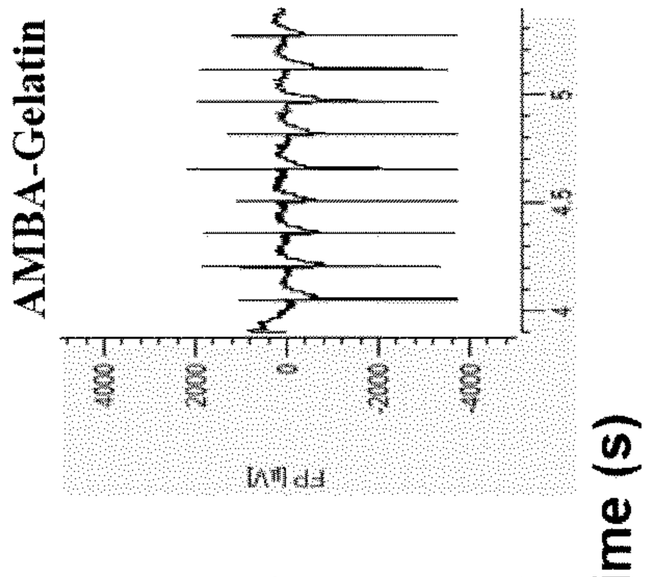


Fig. 13D

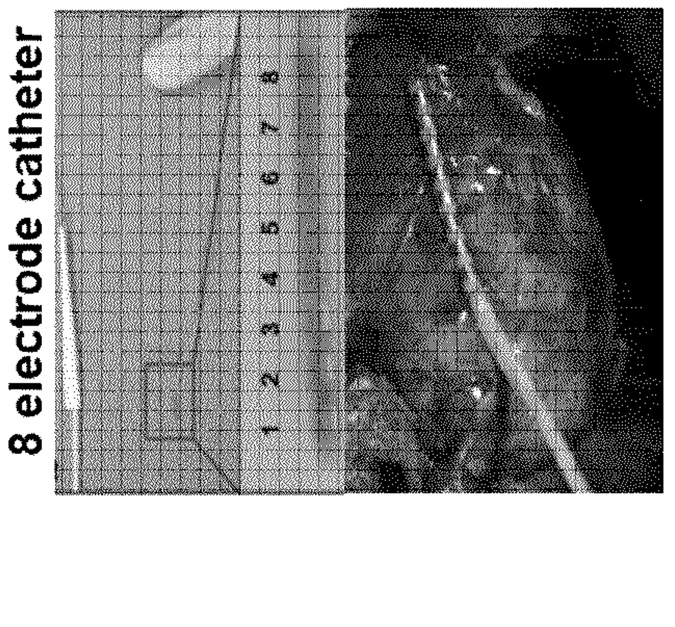
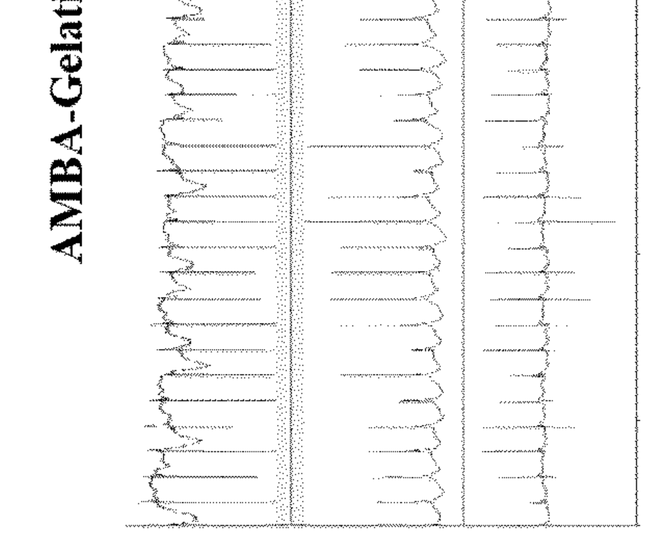
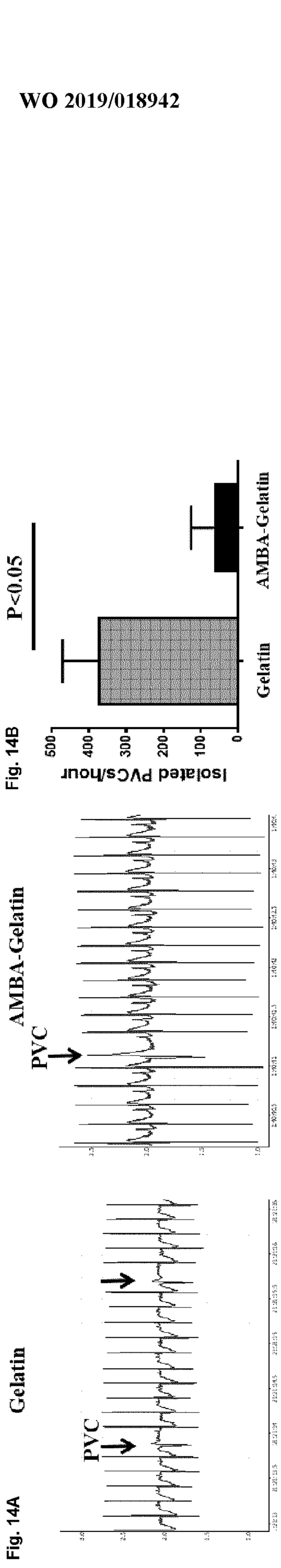
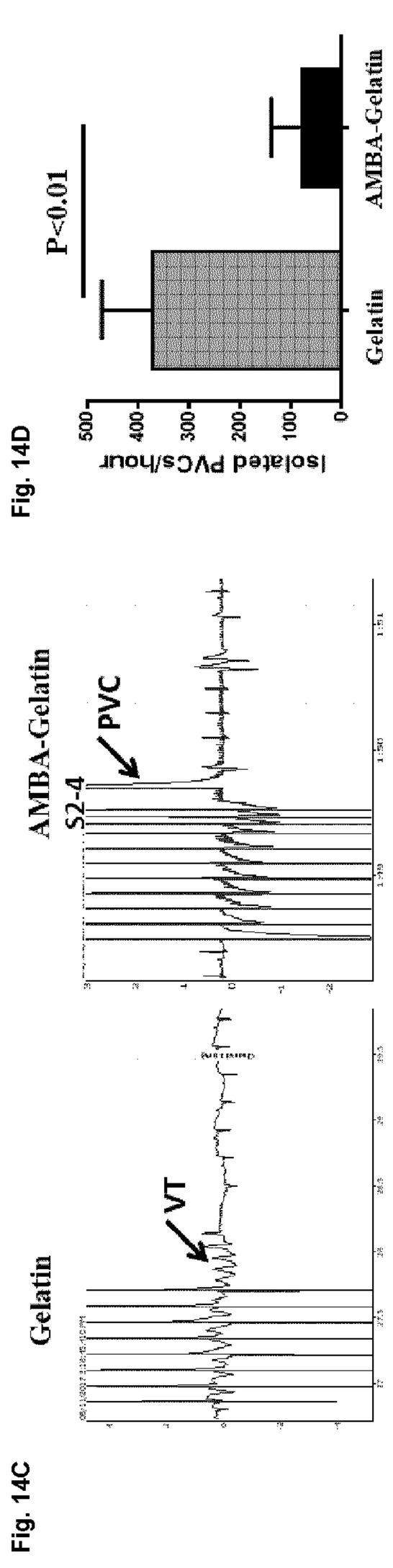


Fig. 13E

Fig. 13F




Fig. 14B
P<0.05
Isolated PVCs/hour
500
400
300
200
100
0
Gelatin
AMBA-Gelatin
AMBA-Gelatin
PVC
Gelatin
PVC


Fig. 14D
P<0.01
Isolated PVCs/hour
500
400
300
200
100
0
Gelatin
AMBA-Gelatin
AMBA-Gelatin
S2-4
PVC
Gelatin
VT

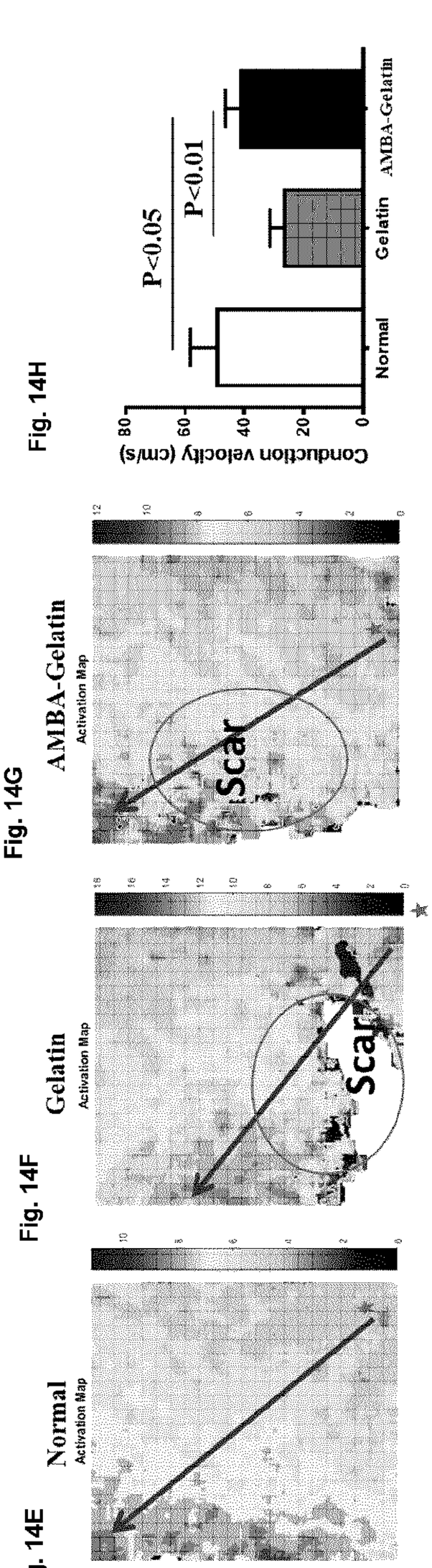
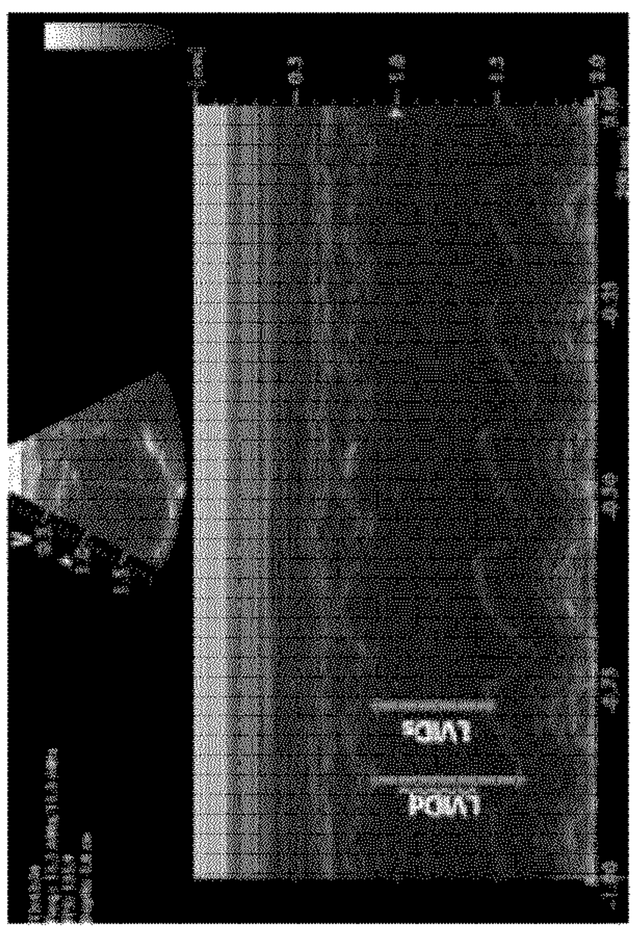

Fig. 14H
P<0.05
P<0.01
Conduction velocity (cm/s)
80
60
40
20
0
Normal
Gelatin
AMBA-Gelatin
Fig. 14G
AMBA-Gelatin
Activation Map
Scar
Fig. 14F
Gelatin
Activation Map
Scar
Fig. 14E
Normal
Activation Map

Fig. 14A
Gelatin
PVC

Fig. 14C
Gelatin
VT



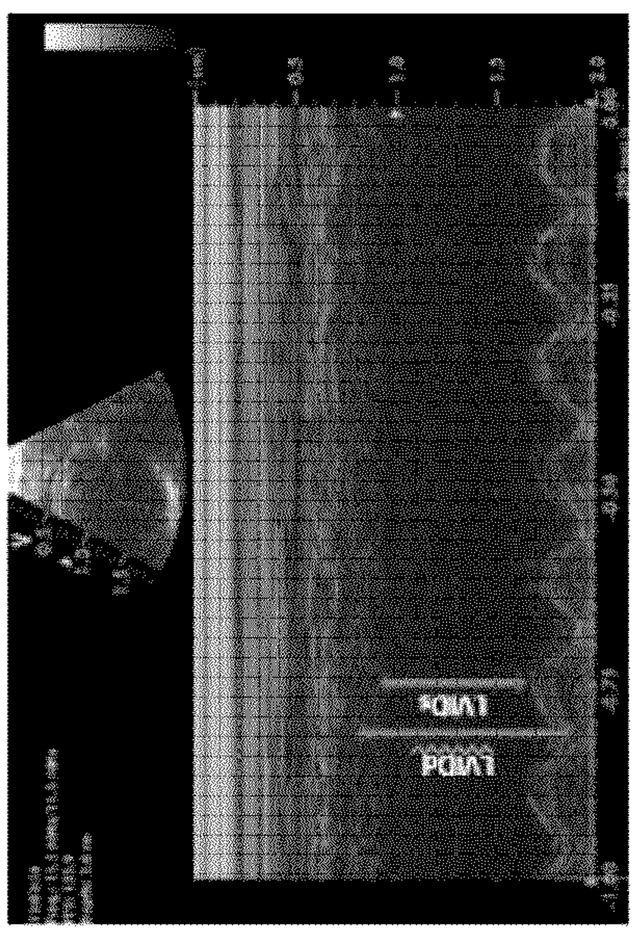


Fig. 15A

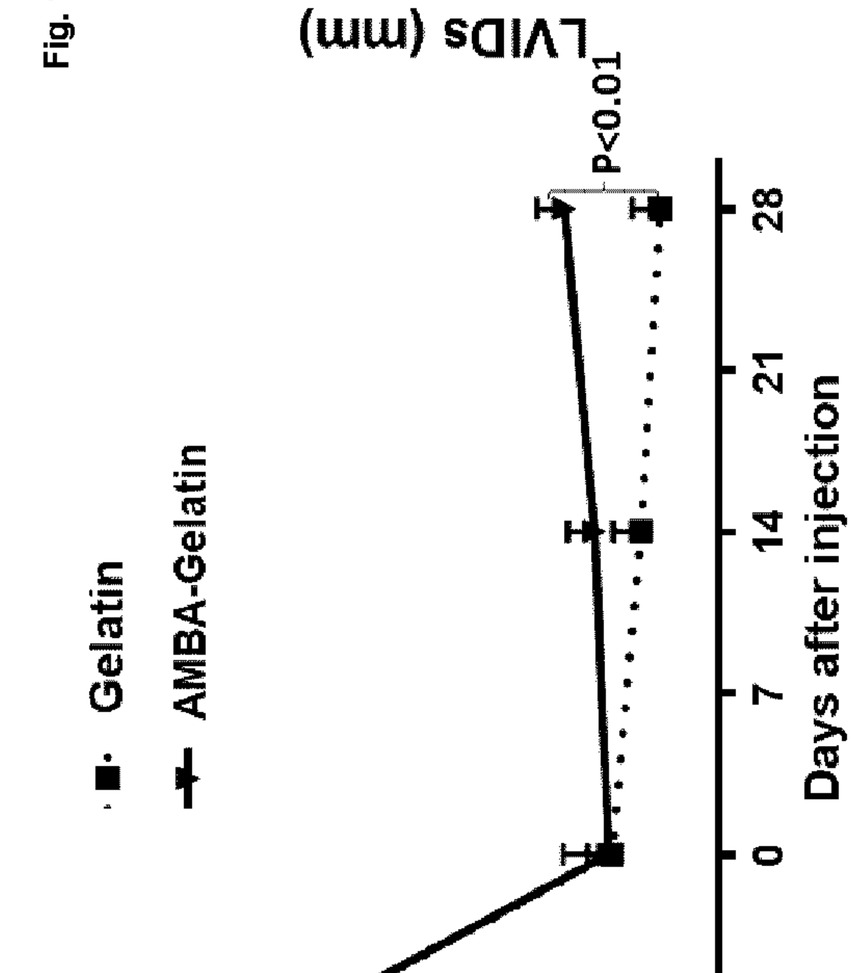


Fig. 15B