Figure 1

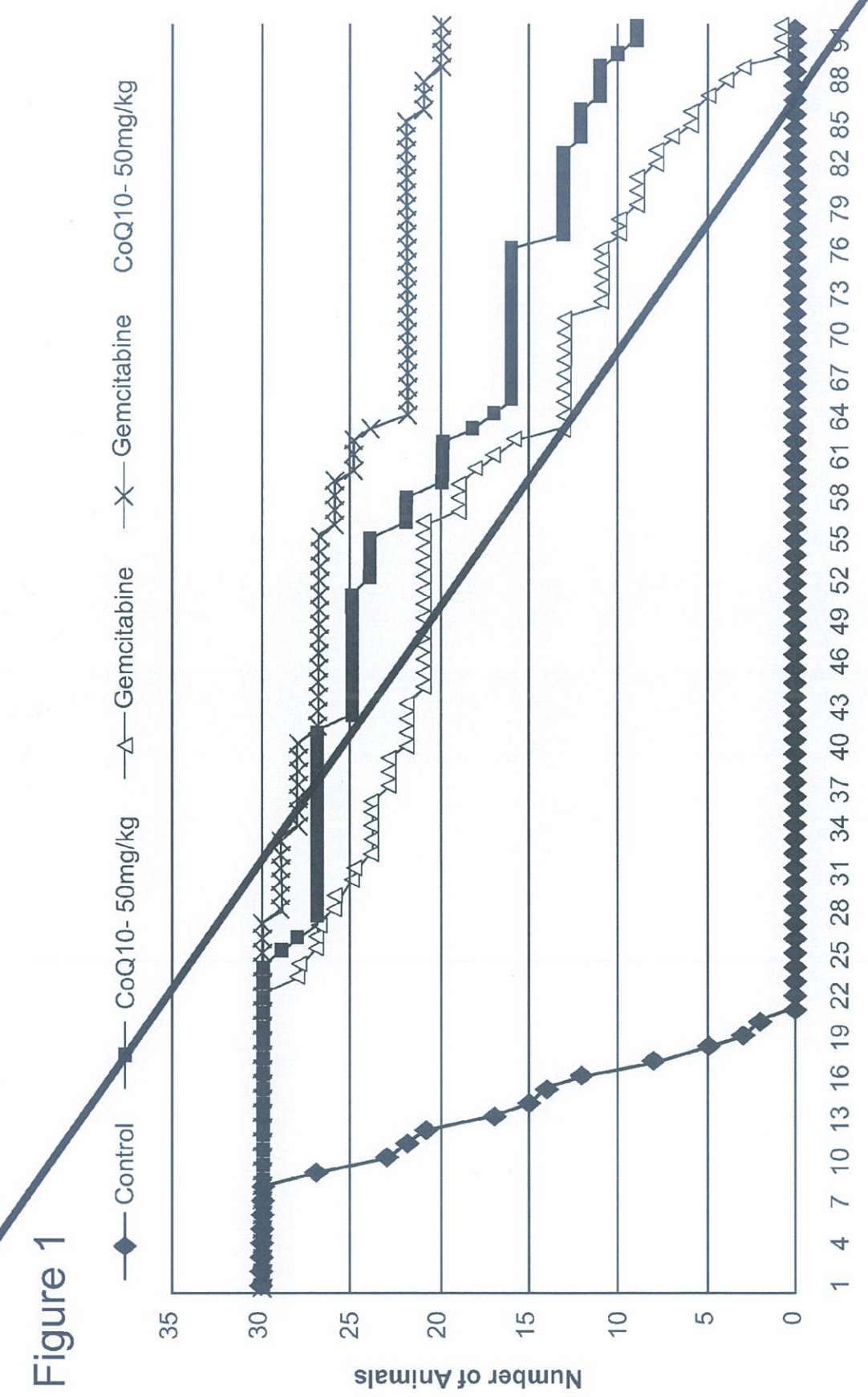

Control
CoQ10- 50mg/kg
Gemcitabine
CoQ10- 50mg/kg
Number of Animals
35
30
25
20
15
10
5
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91

Figure 2

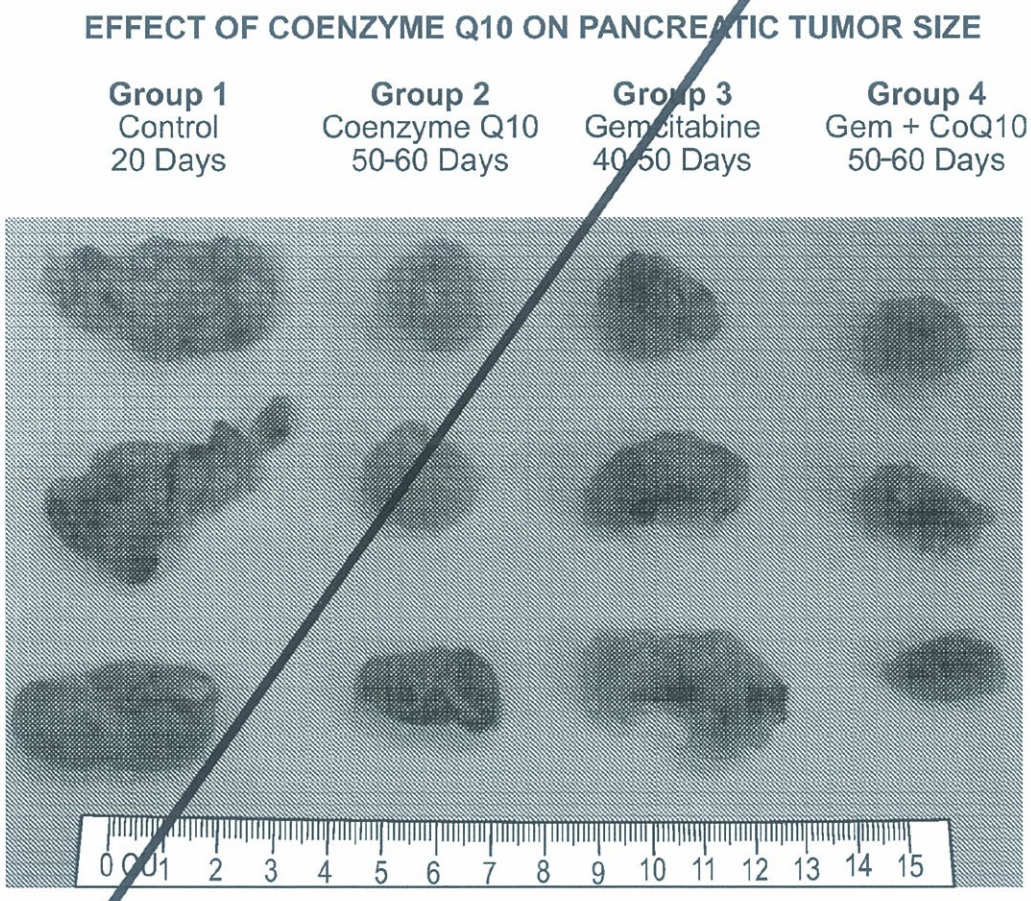

EFFECT OF COENZYME Q10 ON PANCREATIC TUMOR SIZE
Group 1
Control
20 Days
Group 2
Coenzyme Q10
50-60 Days
Group 3
Gemcitabine
40-50 Days
Group 4
Gem + CoQ10
50-60 Days
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Figure 3

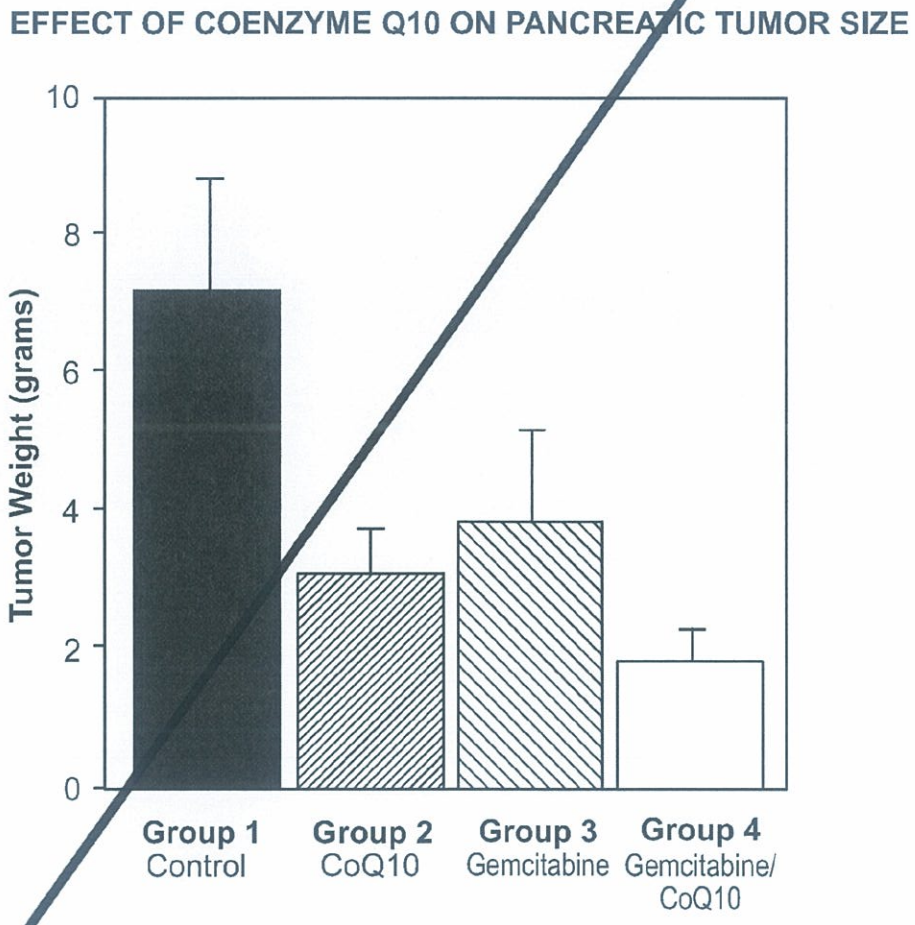

EFFECT OF COENZYME Q10 ON PANCREATIC TUMOR SIZE
Tumor Weight (grams)
10
8
6
4
2
0
Group 1
Control
Group 2
CoQ10
Group 3
Gemcitabine
Group 4
Gemcitabine/
CoQ10

Figure 4

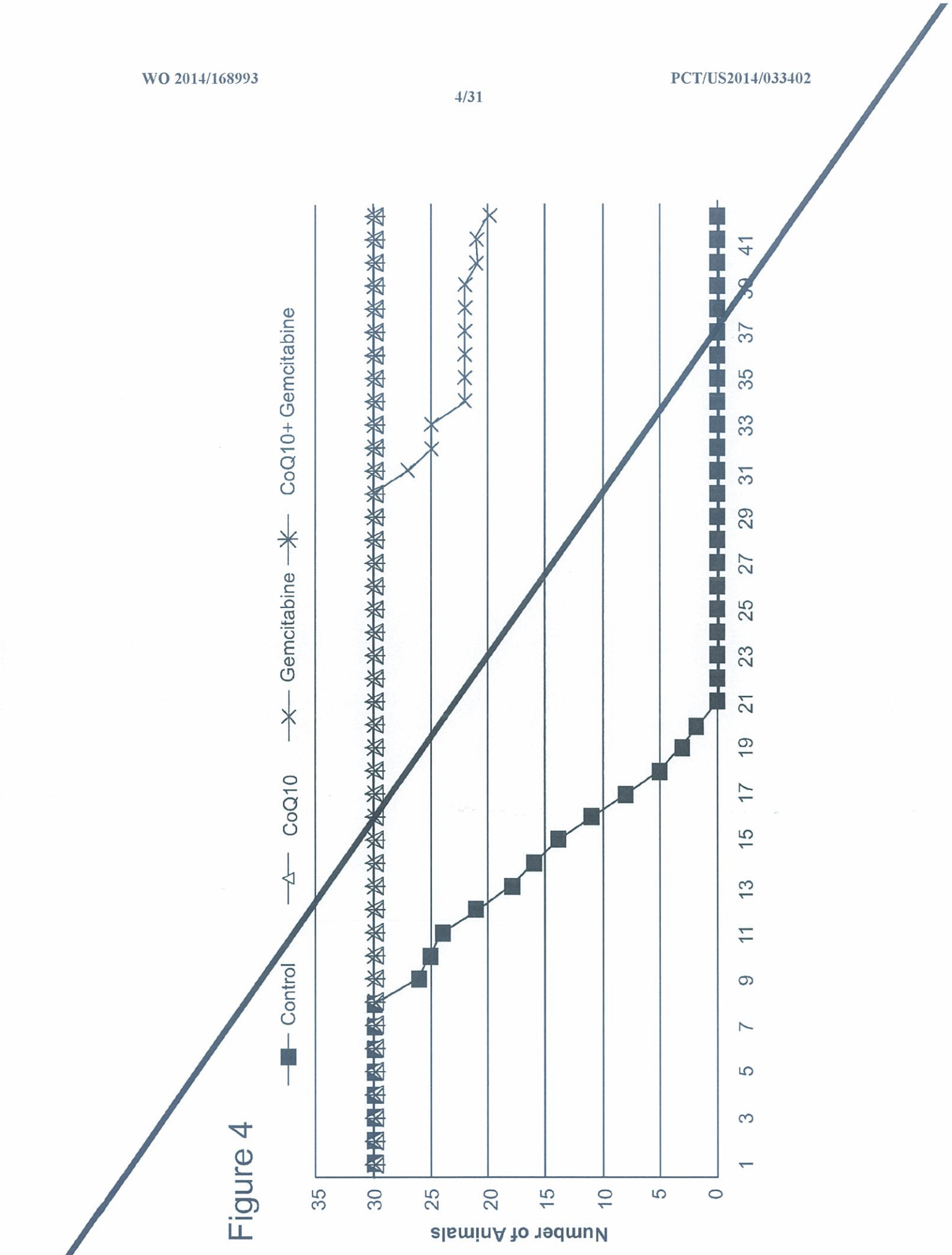

Control
CoQ10
Gemcitabine
CoQ10+ Gemcitabine
Number of Animals
0
5
10
15
20
25
30
35
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41

Figure 5A

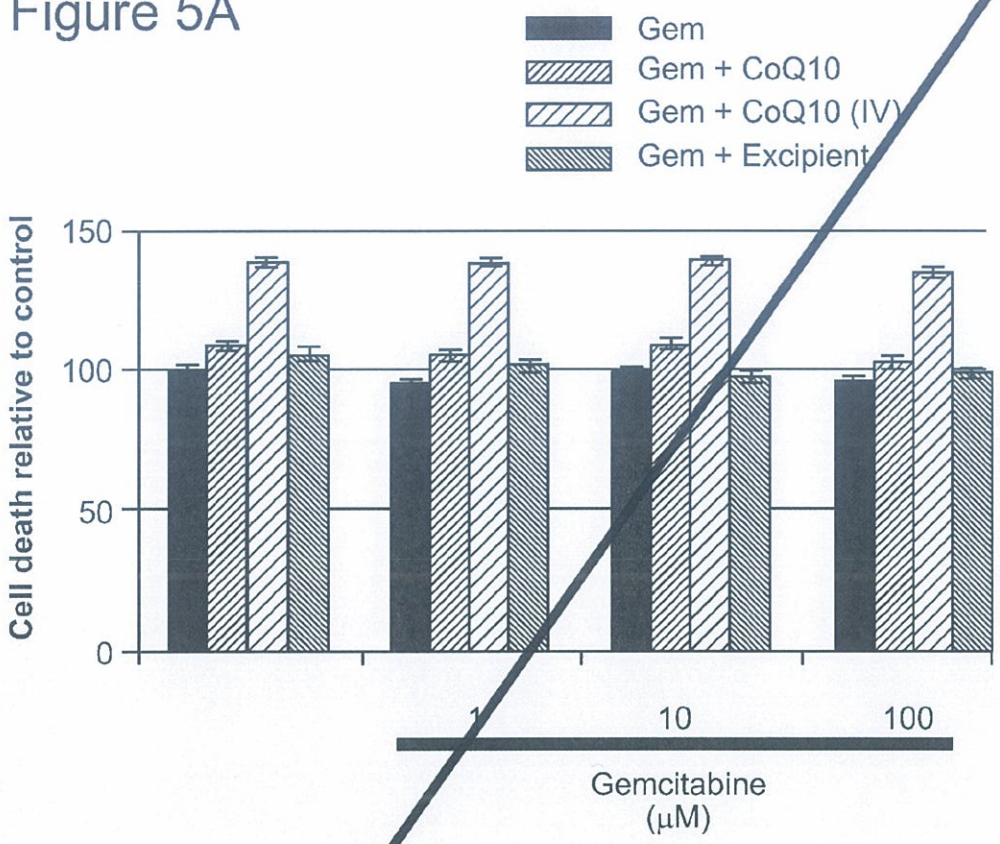


Figure 5B

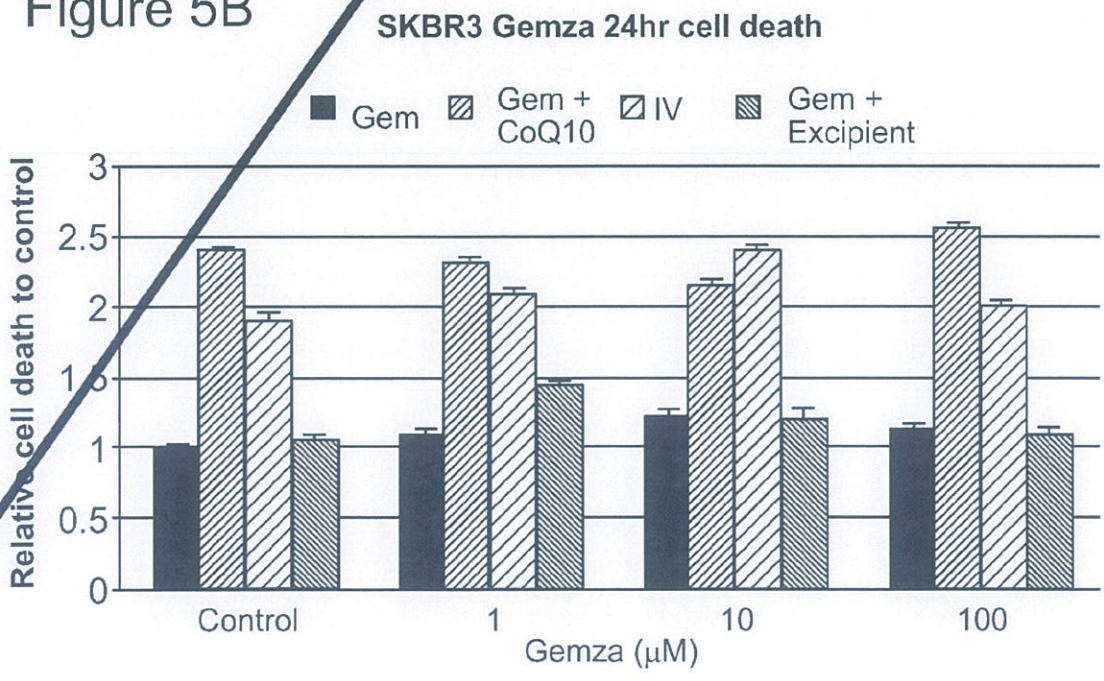


Figure 6A

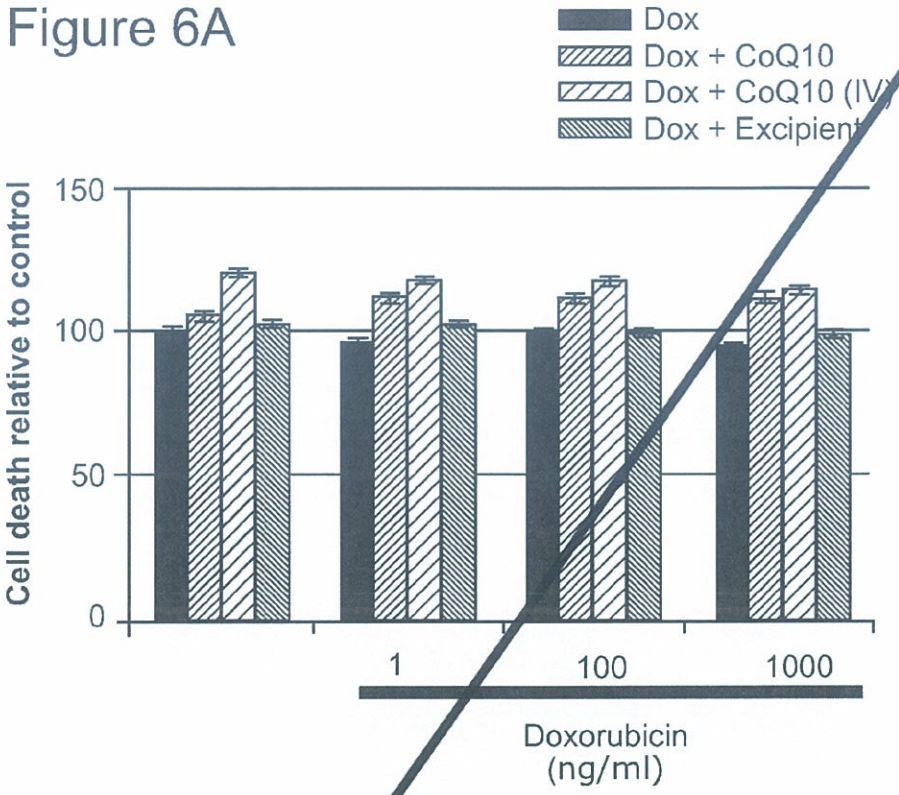
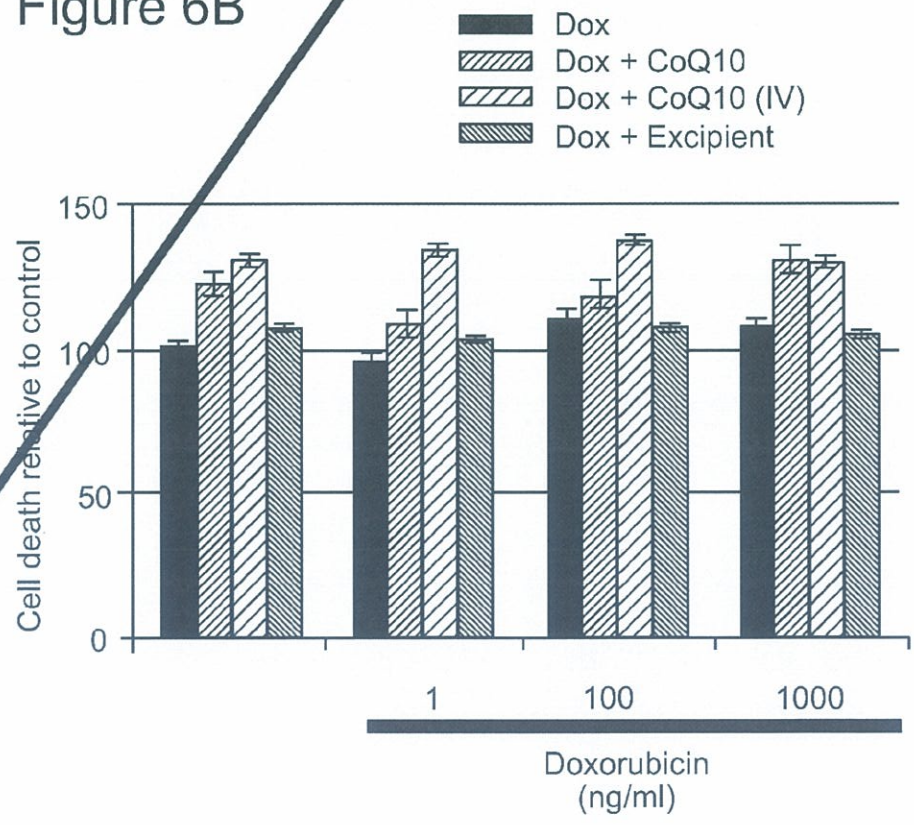


Figure 6B



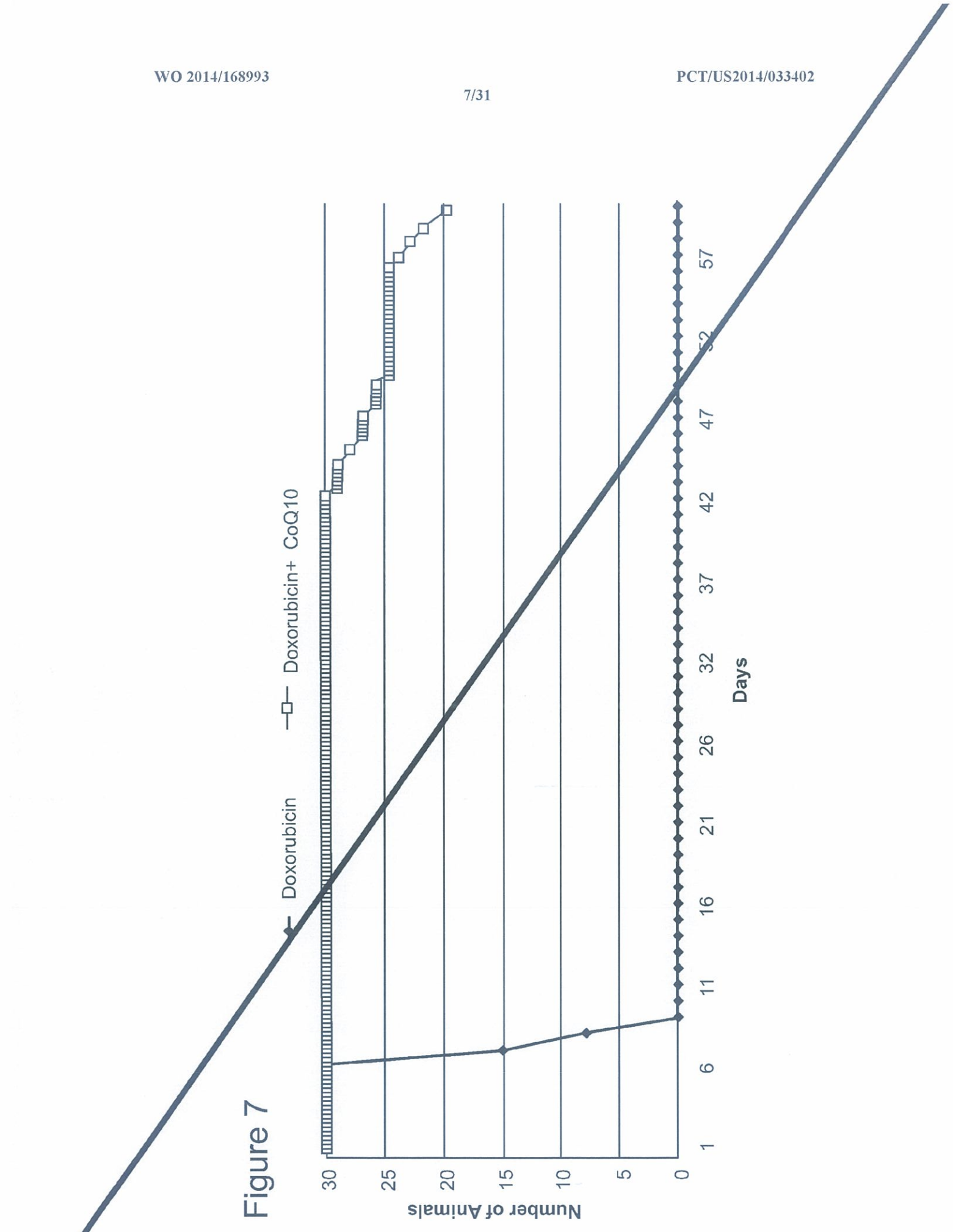

Doxorubicin
Doxorubicin+ CoQ10
Number of Animals
30
25
20
15
10
5
0
Days
1
6
11
16
21
26
32
37
42
47
57

Figure 7

Figure 8

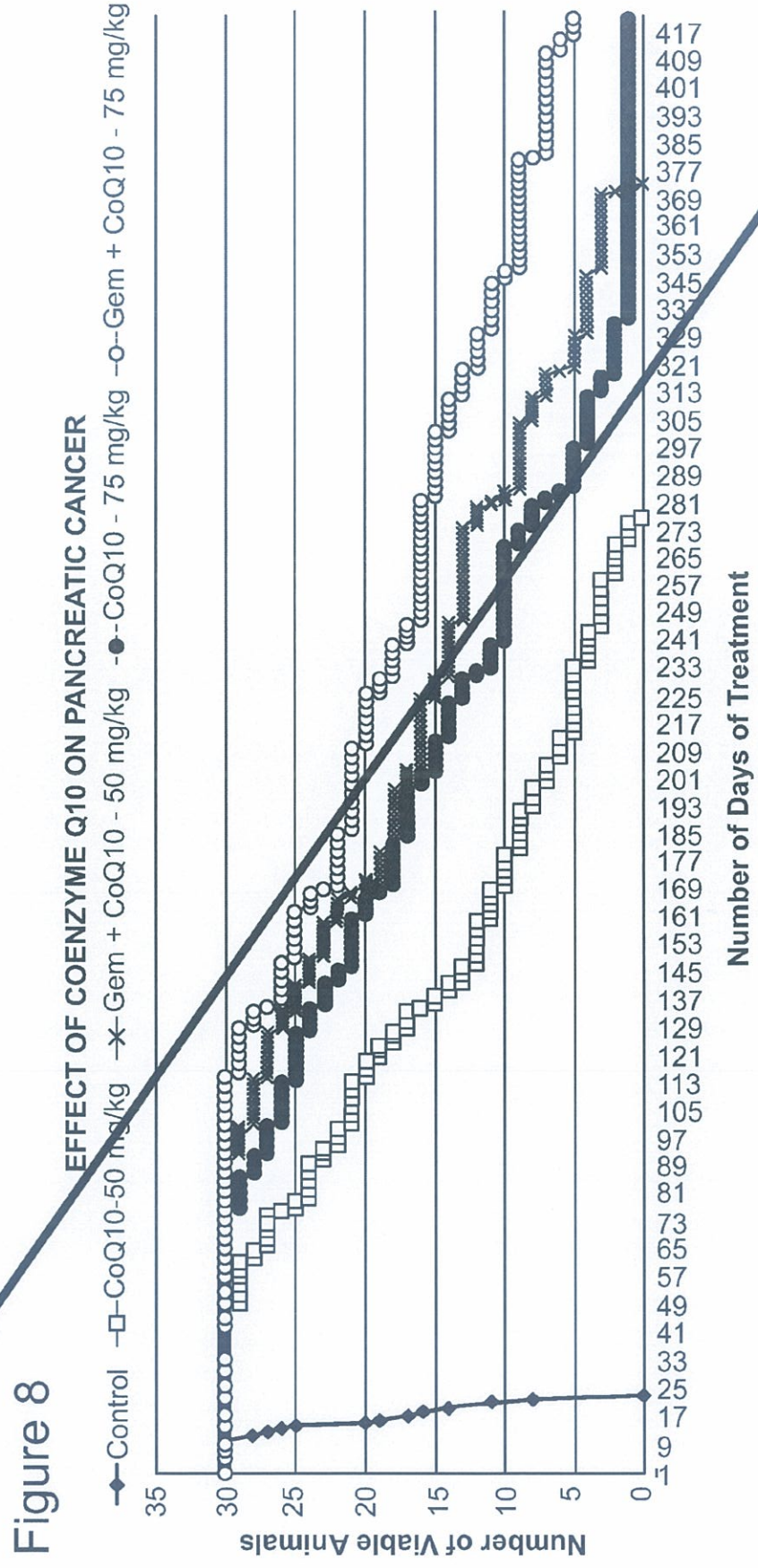

EFFECT OF COENZYME Q10 ON PANCREATIC CANCER
Control
CoQ10-50 mg/kg
Gem + CoQ10 - 50 mg/kg
CoQ10 - 75 mg/kg
Gem + CoQ10 - 75 mg/kg
Number of Viable Animals
35
30
25
20
15
10
5
0
Number of Days of Treatment
1
9
17
25
33
41
49
57
65
73
81
89
97
105
113
121
129
137
145
153
161
169
177
185
193
201
209
217
225
233
241
249
257
265
273
281
289
297
305
313
321
329
337
345
353
361
369
377
385
393
401
409
417

Figure 9A

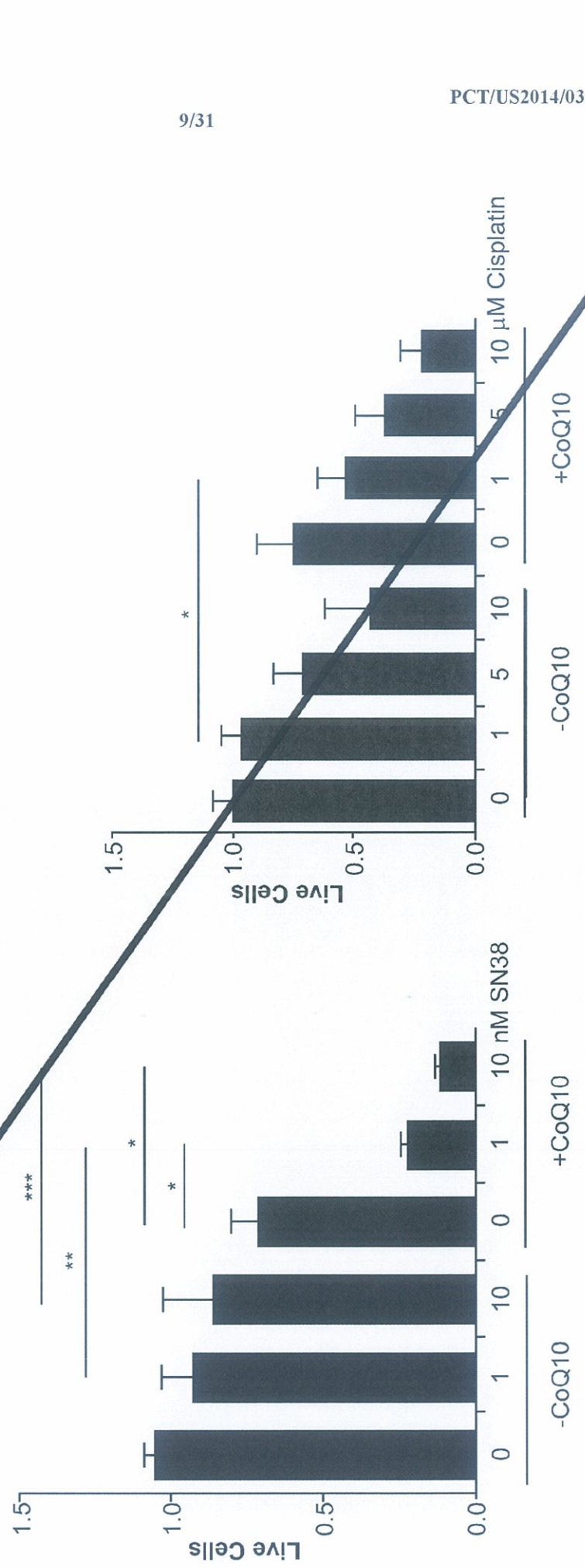


Figure 9B

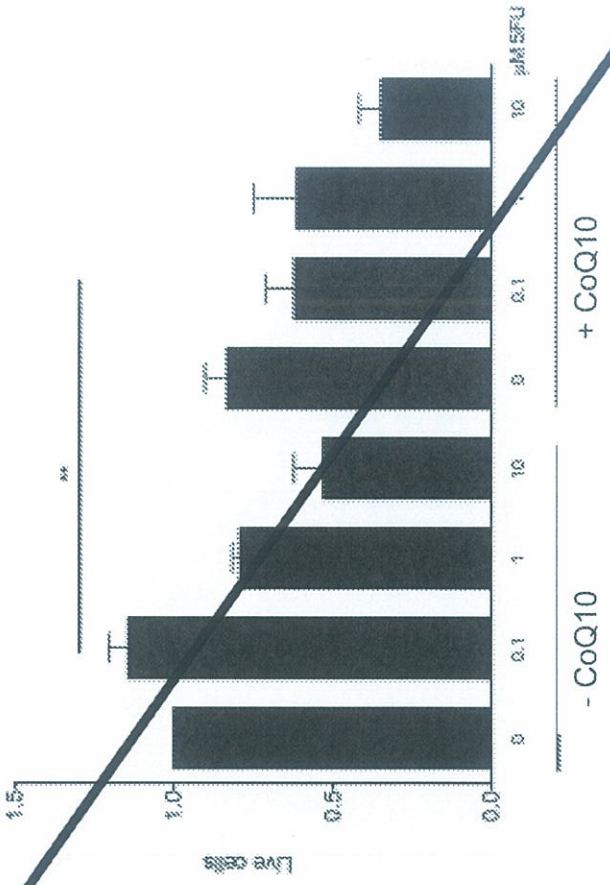


Figure 9C

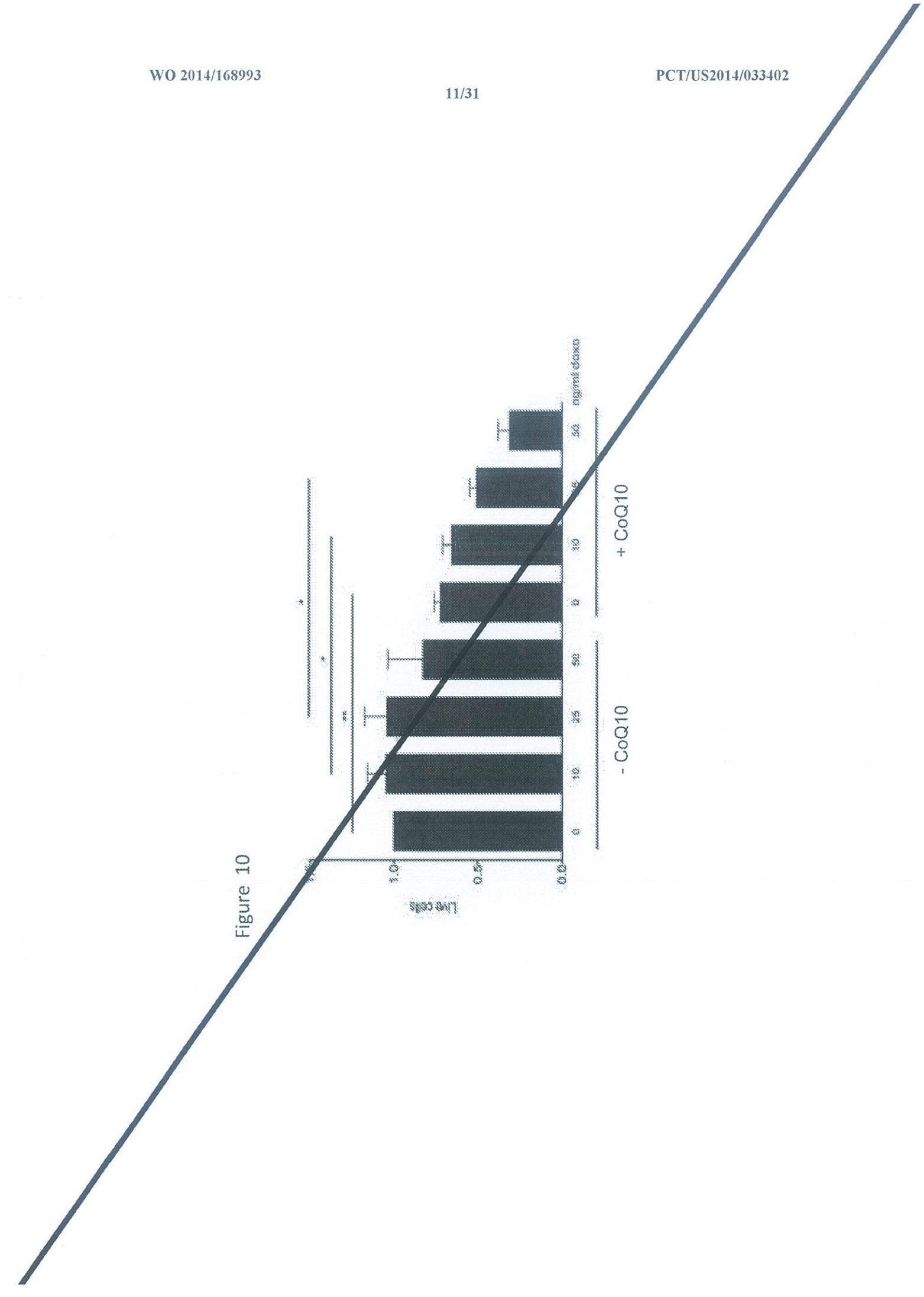


Figure 10

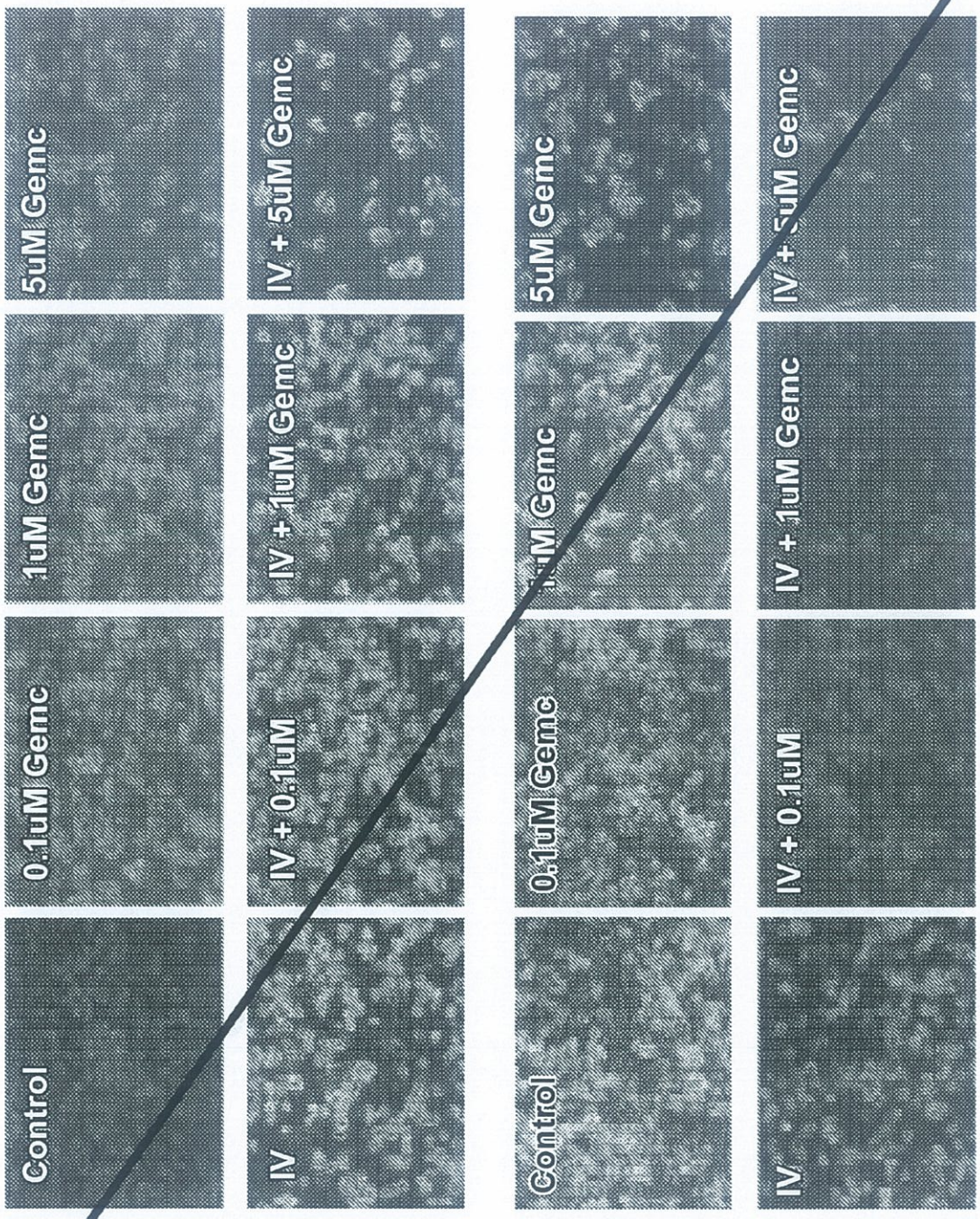

A
Control
0.1uM Gemc
1uM Gemc
5uM Gemc
IV
IV + 0.1uM
IV + 1uM Gemc
IV + 5uM Gemc
B
Control
0.1uM Gemc
1uM Gemc
5uM Gemc
IV
IV + 0.1uM
IV + 1uM Gemc
IV + 5uM Gemc

Figure 11

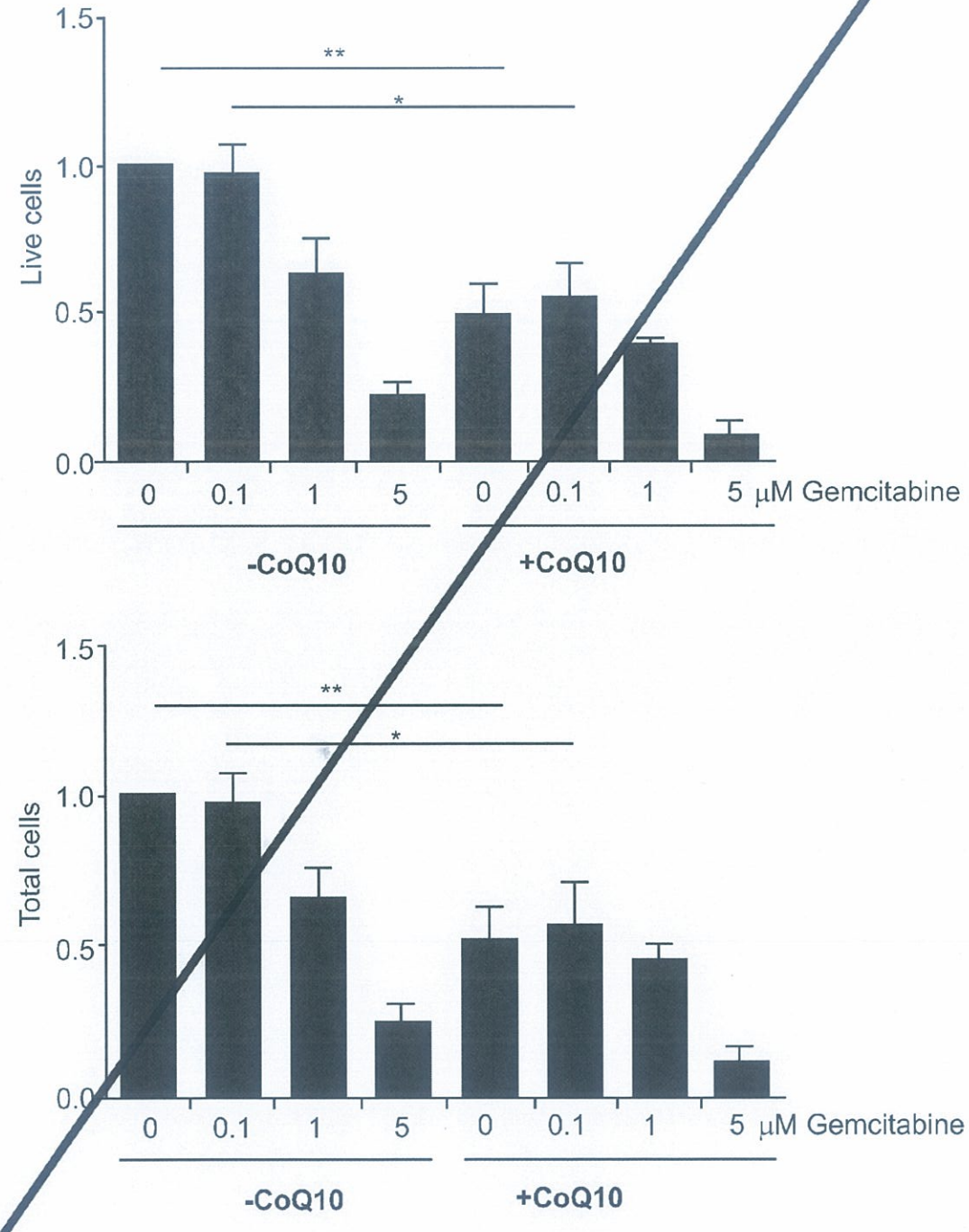

1.5
1.0
0.5
0.0
Live cells
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10
1.5
1.0
0.5
0.0
Total cells
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10

Figure 12A

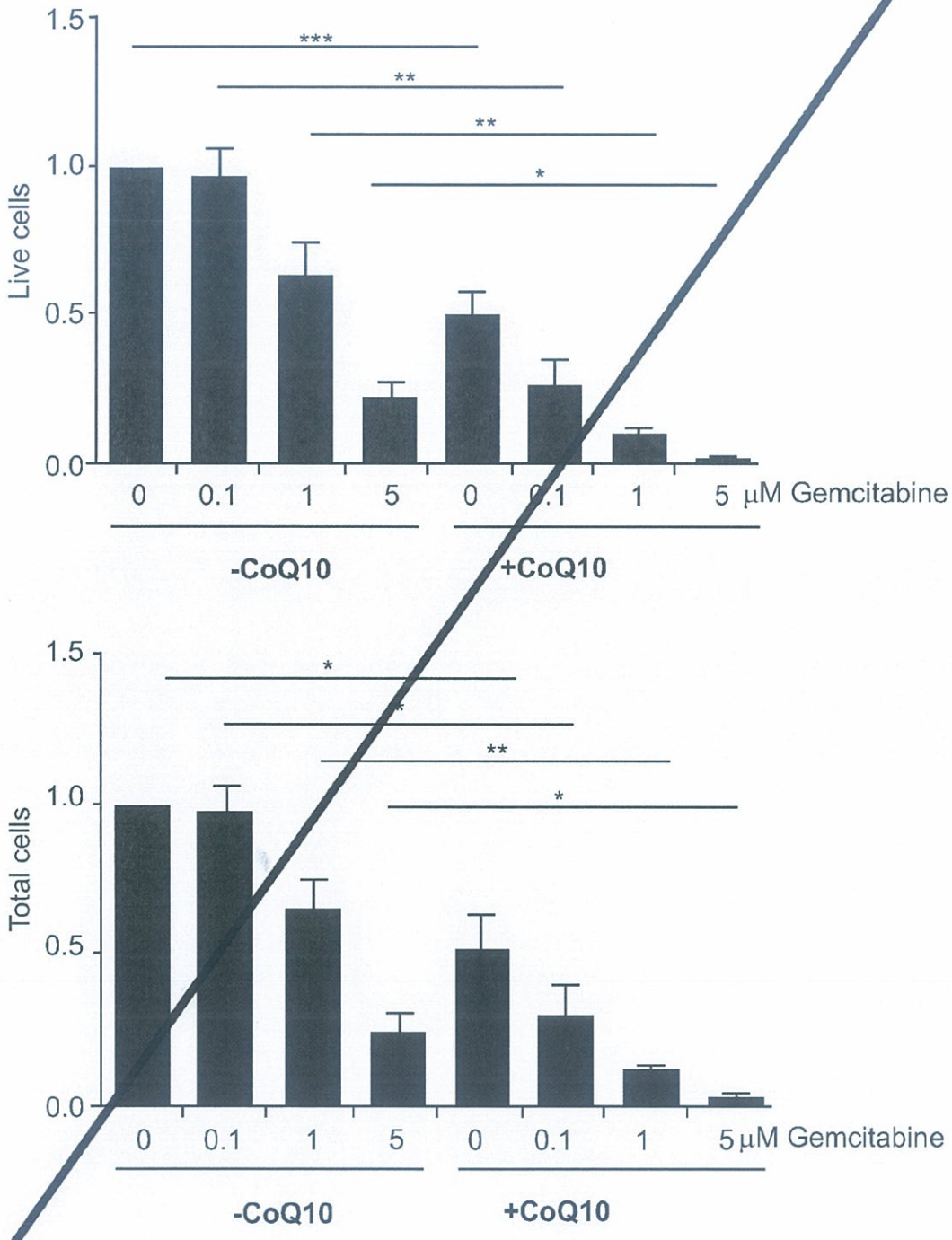

1.5
1.0
0.5
0.0
Live cells
***
**
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10
1.5
1.0
0.5
0.0
Total cells
*
*
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10

Figure 12B

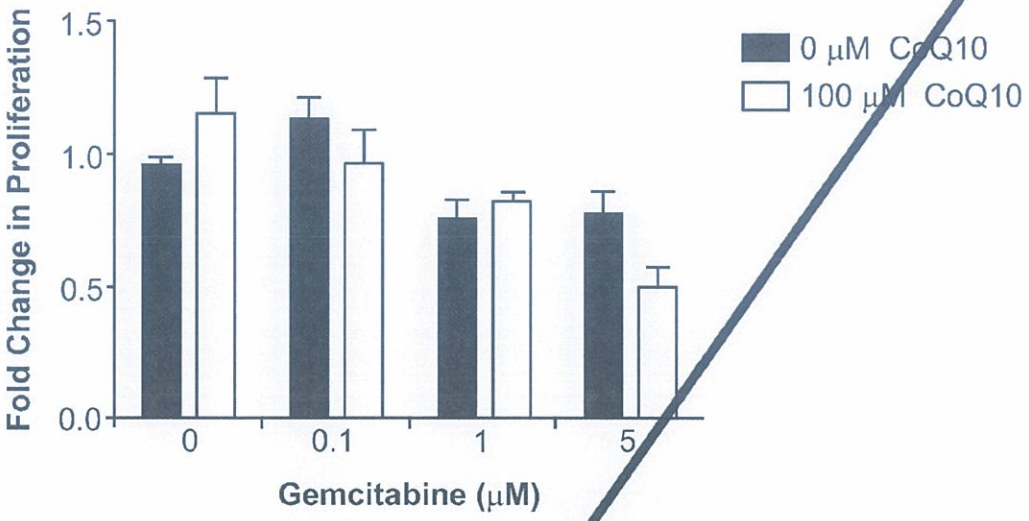


Figure 13

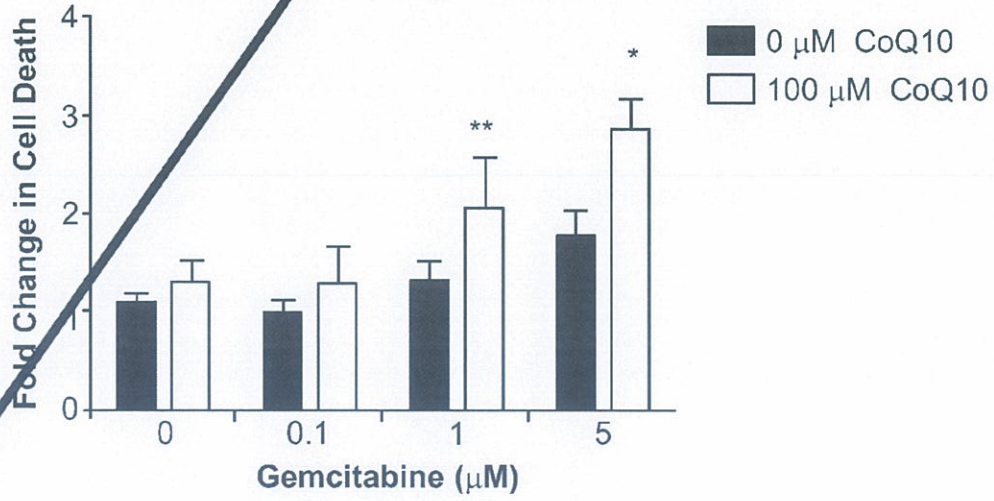


Figure 14

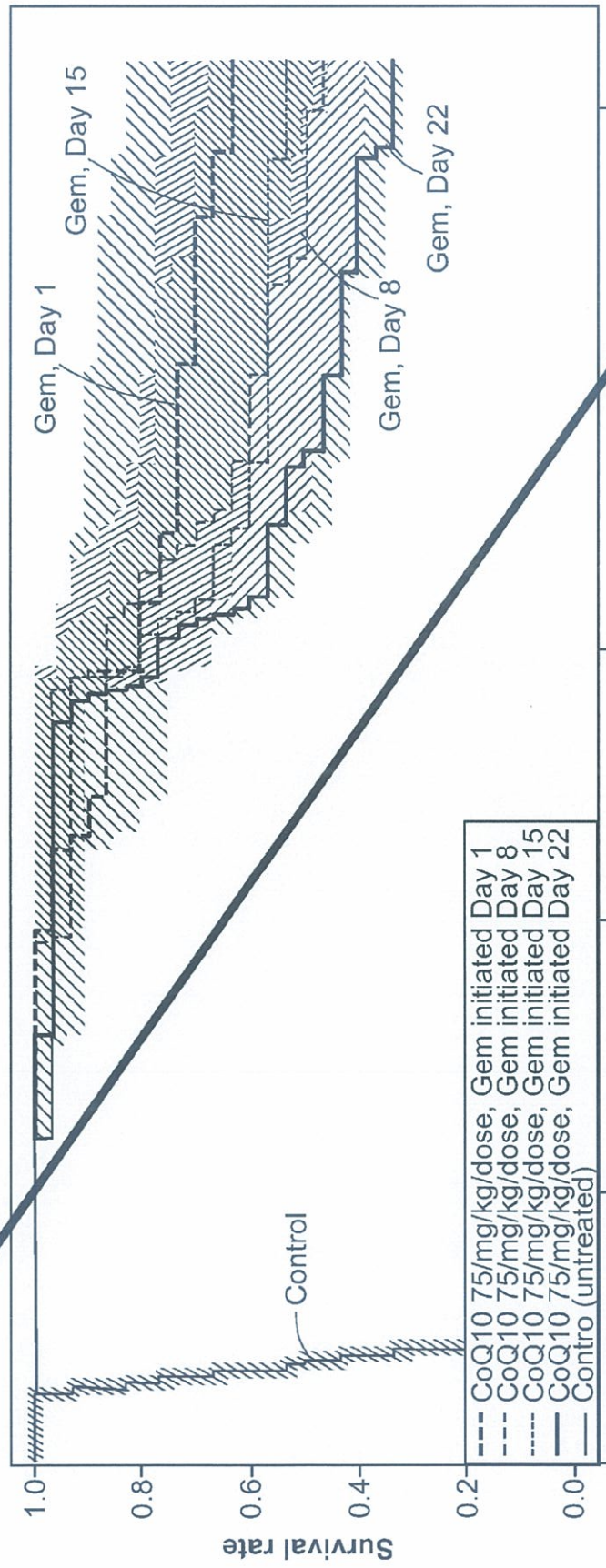

Survival rate
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
250
Days
Gem, Day 1
Gem, Day 15
Gem, Day 22
Gem, Day 8
Control
CoQ10 75/mg/kg/dose, Gem initiated Day 1
CoQ10 75/mg/kg/dose, Gem initiated Day 8
CoQ10 75/mg/kg/dose, Gem initiated Day 15
CoQ10 75/mg/kg/dose, Gem initiated Day 22
Contro (untreated)

Figure 15

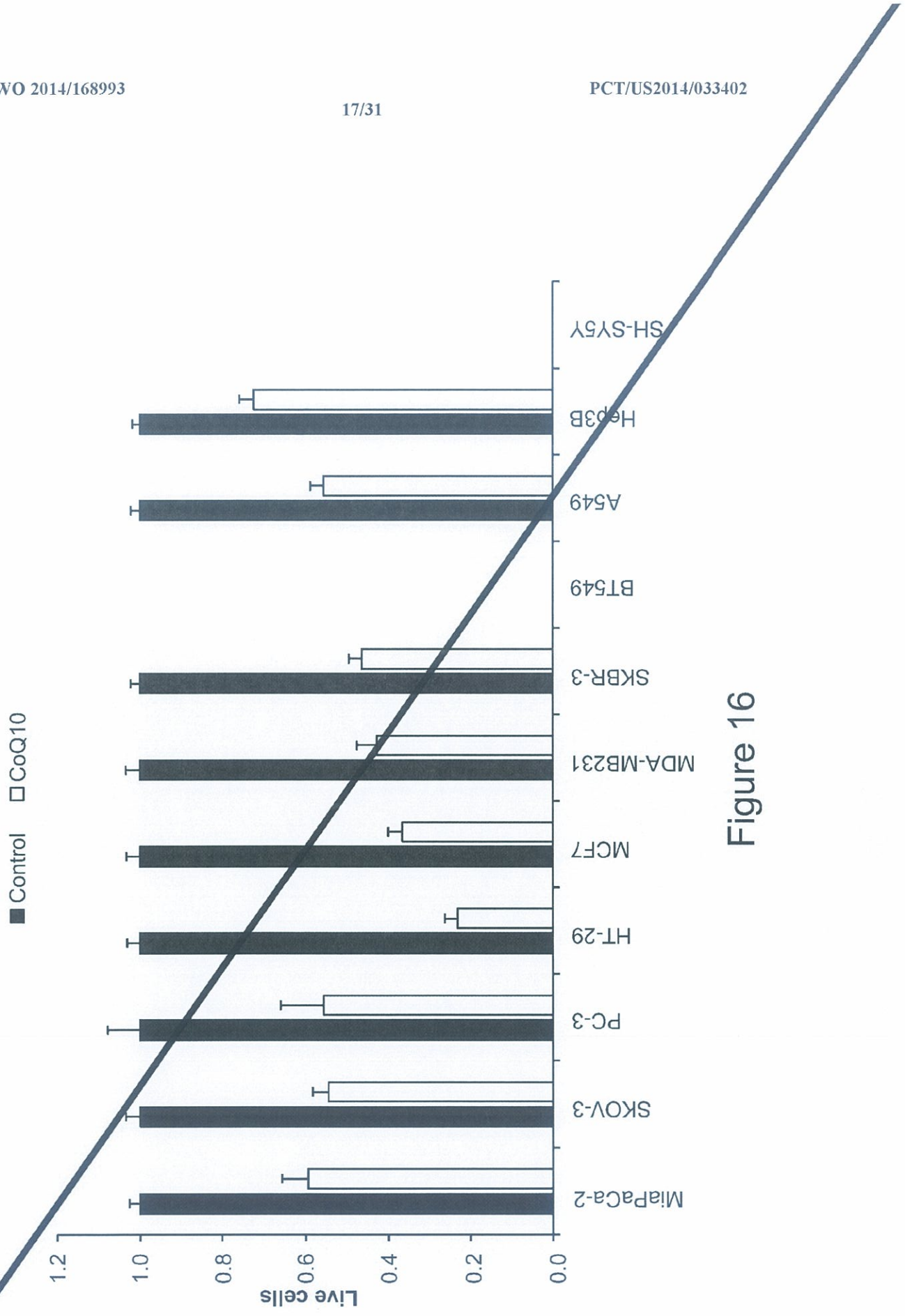

Live cells
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Control
CoQ10
MiaPaCa-2
SKOV-3
PC-3
HT-29
MCF7
MDA-MB231
SKBR-3
BT549
A549
Hep3B
SH-SY5Y

Figure 16

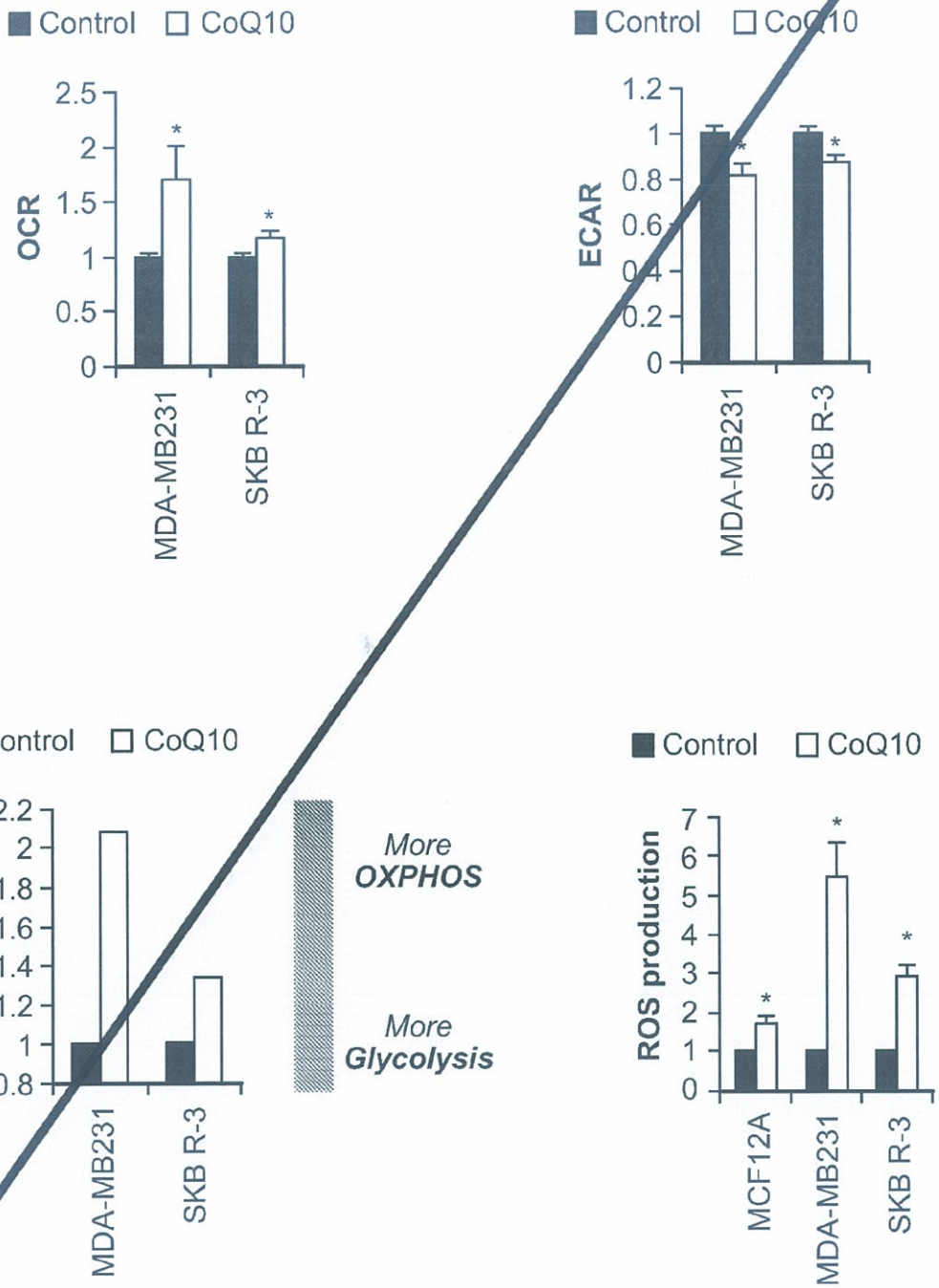
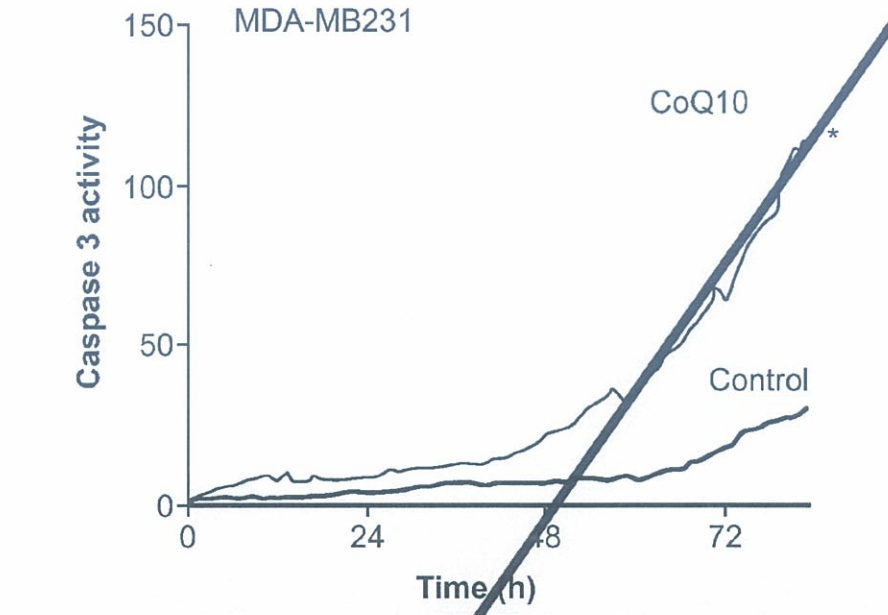

Control
CoQ10
OCR
2.5
2
1.5
1
0.5
0
MDA-MB231
SKB R-3
Control
CoQ10
ECAR
1.2
1
0.8
0.6
0.4
0.2
0
MDA-MB231
SKB R-3
Control
CoQ10
OCR/ECAR
2.2
2
1.8
1.6
1.4
1.2
1
0.8
MDA-MB231
SKB R-3
More
OXPHOS
More
Glycolysis
Control
CoQ10
ROS production
7
6
5
4
3
2
1
0
MCF12A
MDA-MB231
SKB R-3

Figure 17


MDA-MB231
CoQ10
Control
Caspase 3 activity
150
100
50
0
0
24
48
72
Time (h)
*

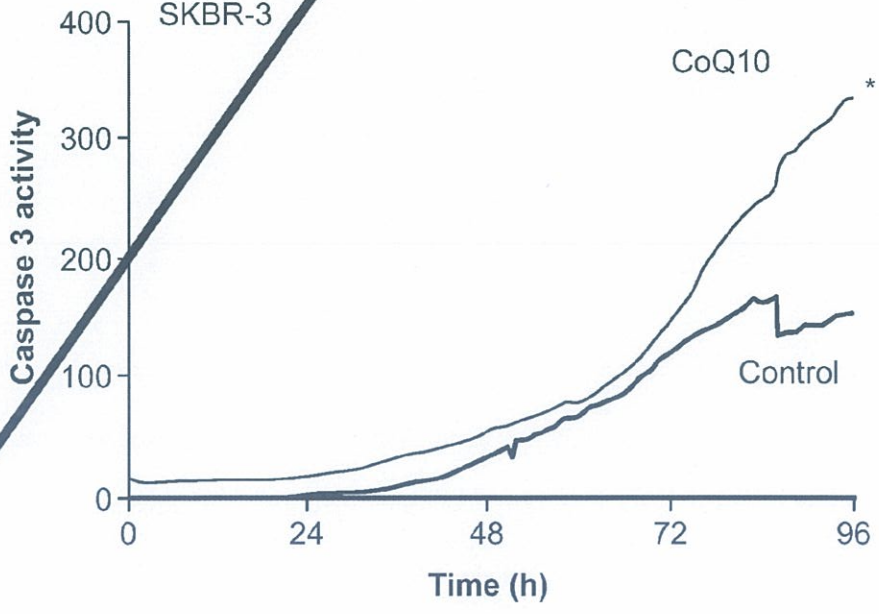

SKBR-3
CoQ10
Control
Caspase 3 activity
400
300
200
100
0
0
24
48
72
96
Time (h)
*

Figure 18

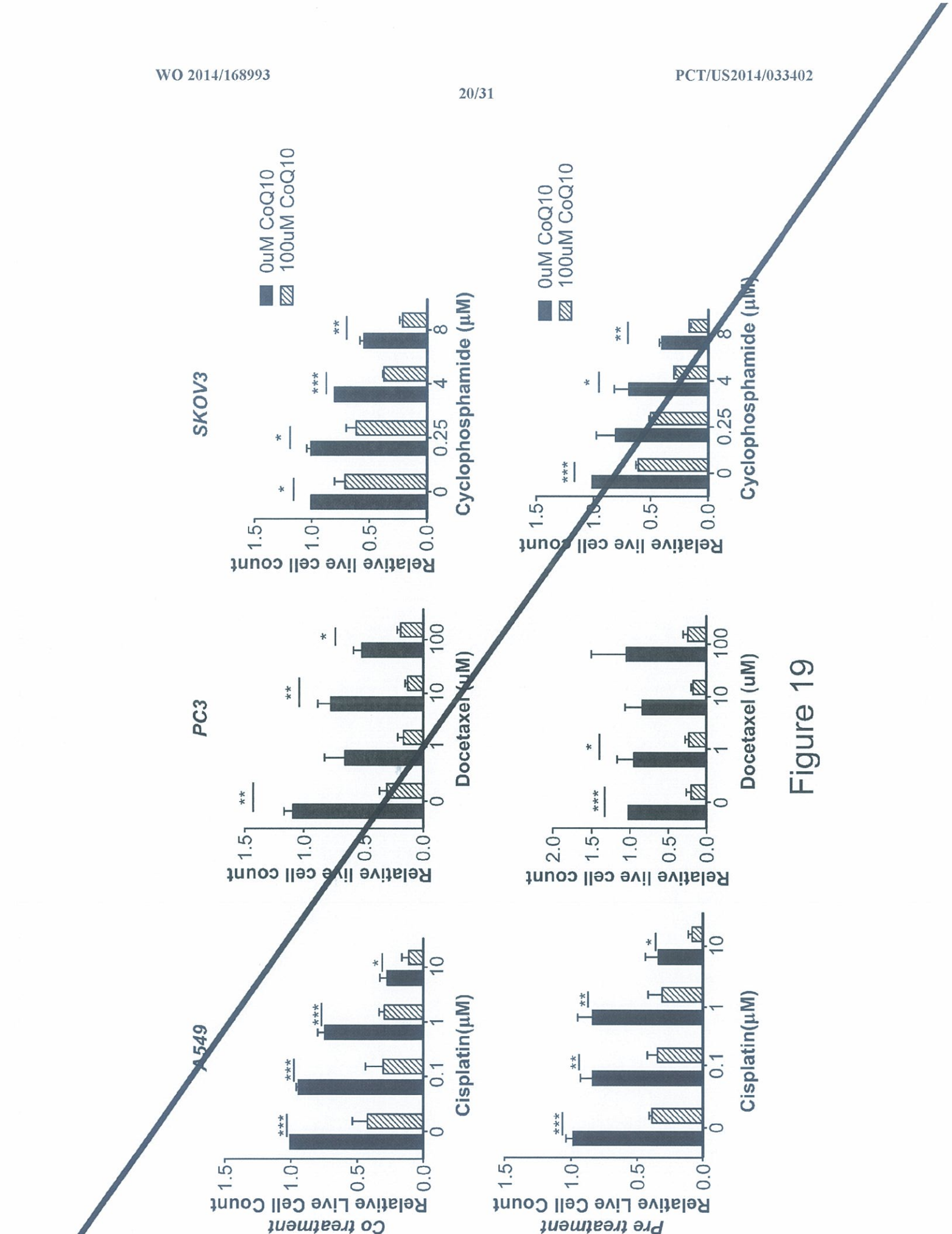

A549
PC3
SKOV3
Co treatment
Pre treatment
Relative Live Cell Count
Cisplatin(μM)
Docetaxel (uM)
Cyclophosphamide (μM)
0uM CoQ10
100uM CoQ10

Figure 19

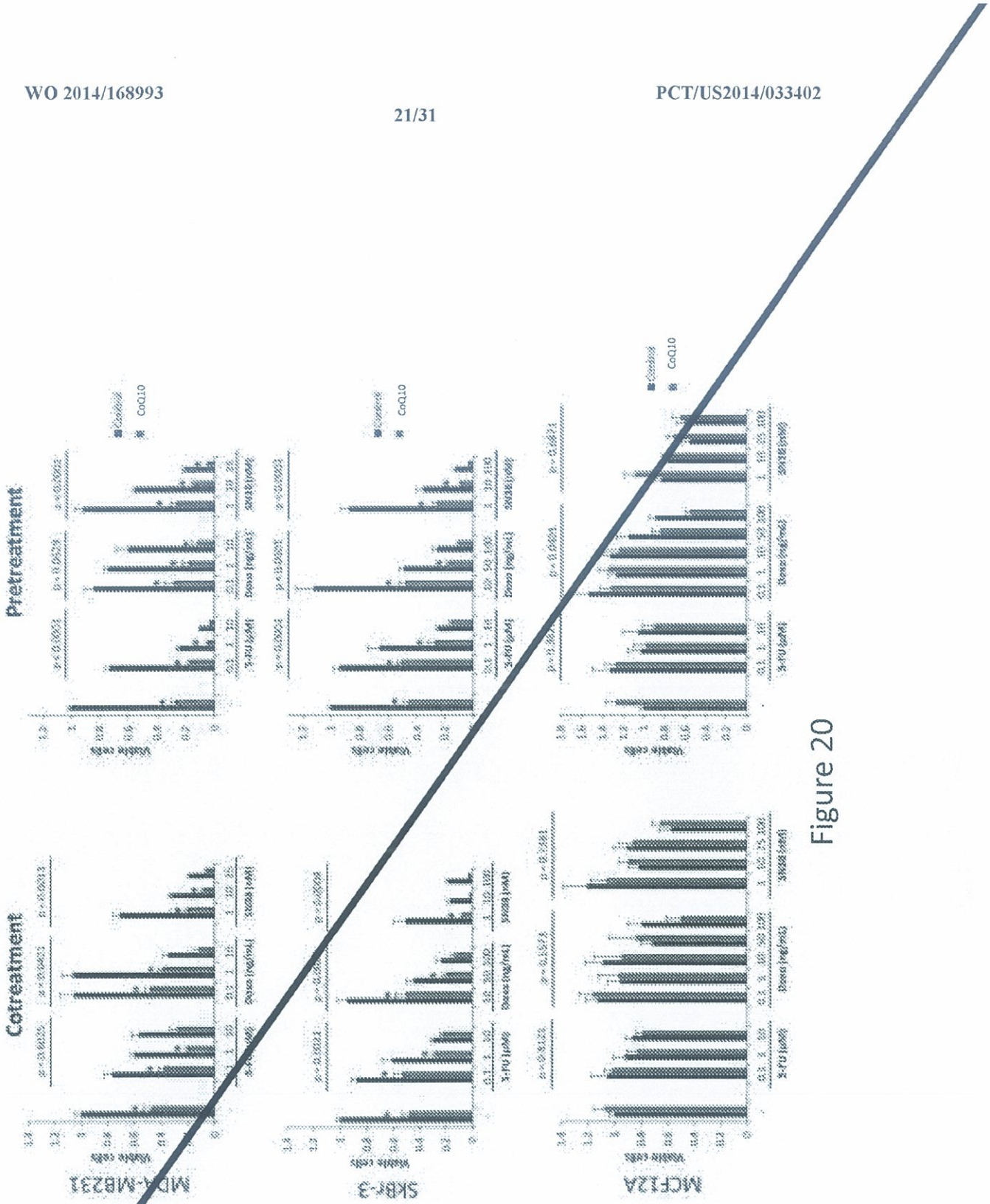

Pretreatment
Cotreatment
Control
CoQ10
MDA-MB231
SKBr-3
MCF12A
Viable cells
5-FU (μM)
Doxo (ng/mL)
Docetaxel (nM)

Figure 20

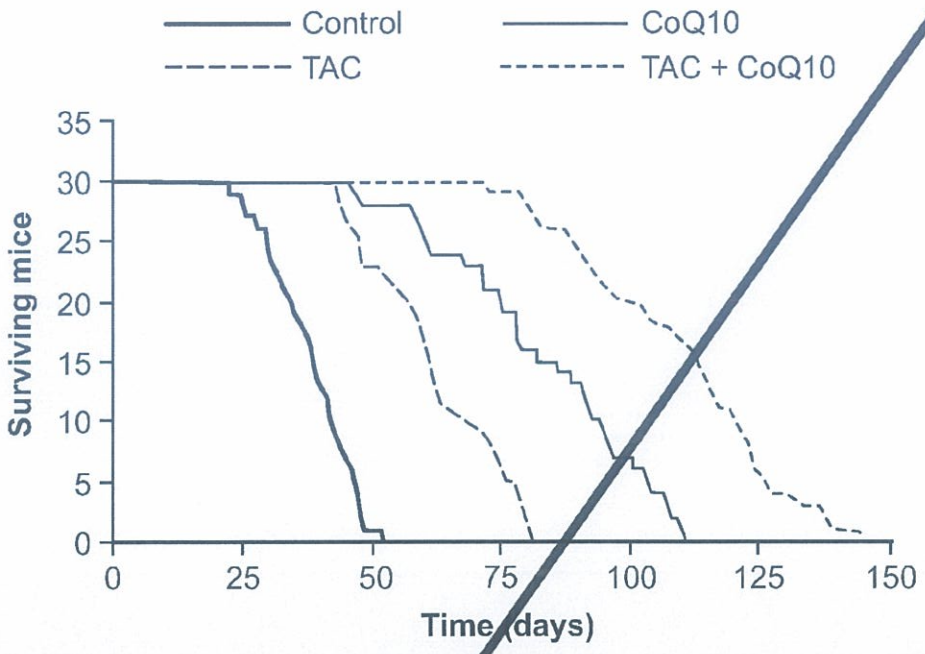


Figure 21

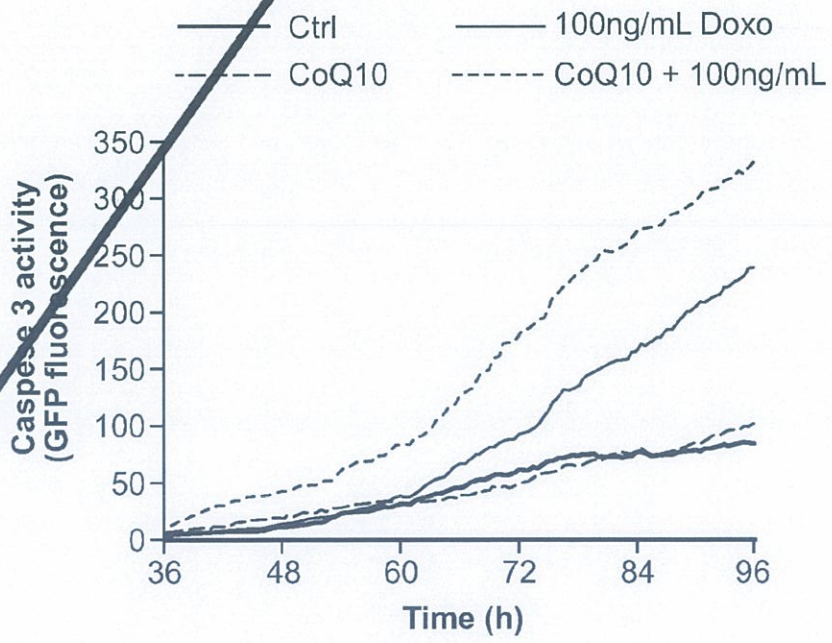
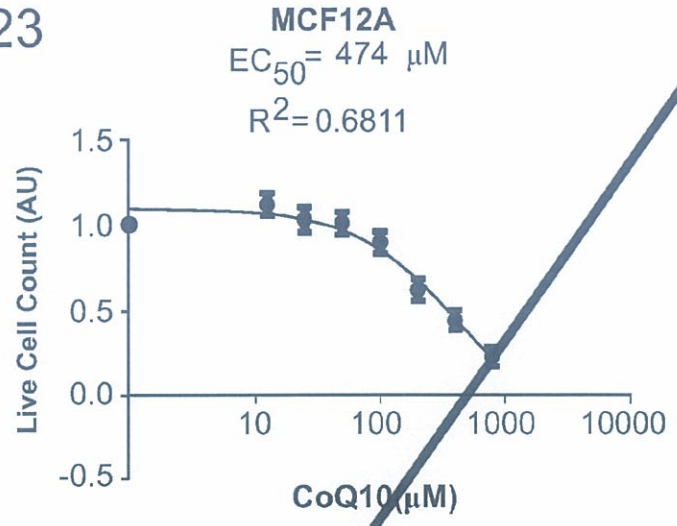
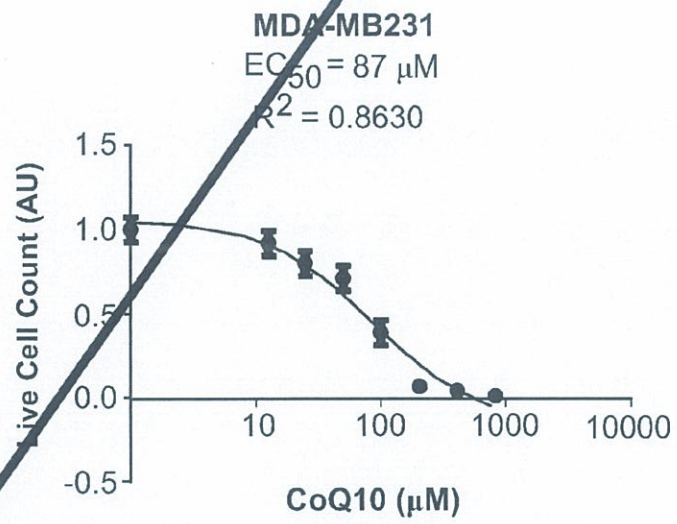
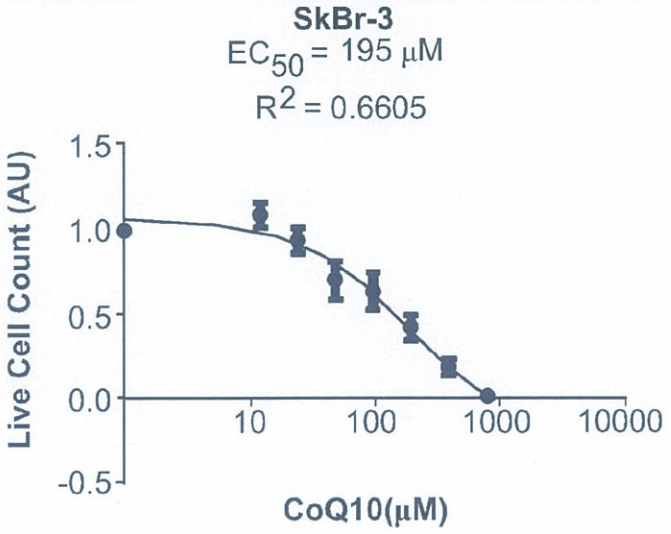


Figure 22

Figure 23


MCF12A
EC50= 474 μM
R2= 0.6811
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10(μM)


MDA-MB231
EC50 = 87 μM
R2 = 0.8630
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10 (μM)


SkBr-3
EC50 = 195 μM
R2 = 0.6605
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10(μM)

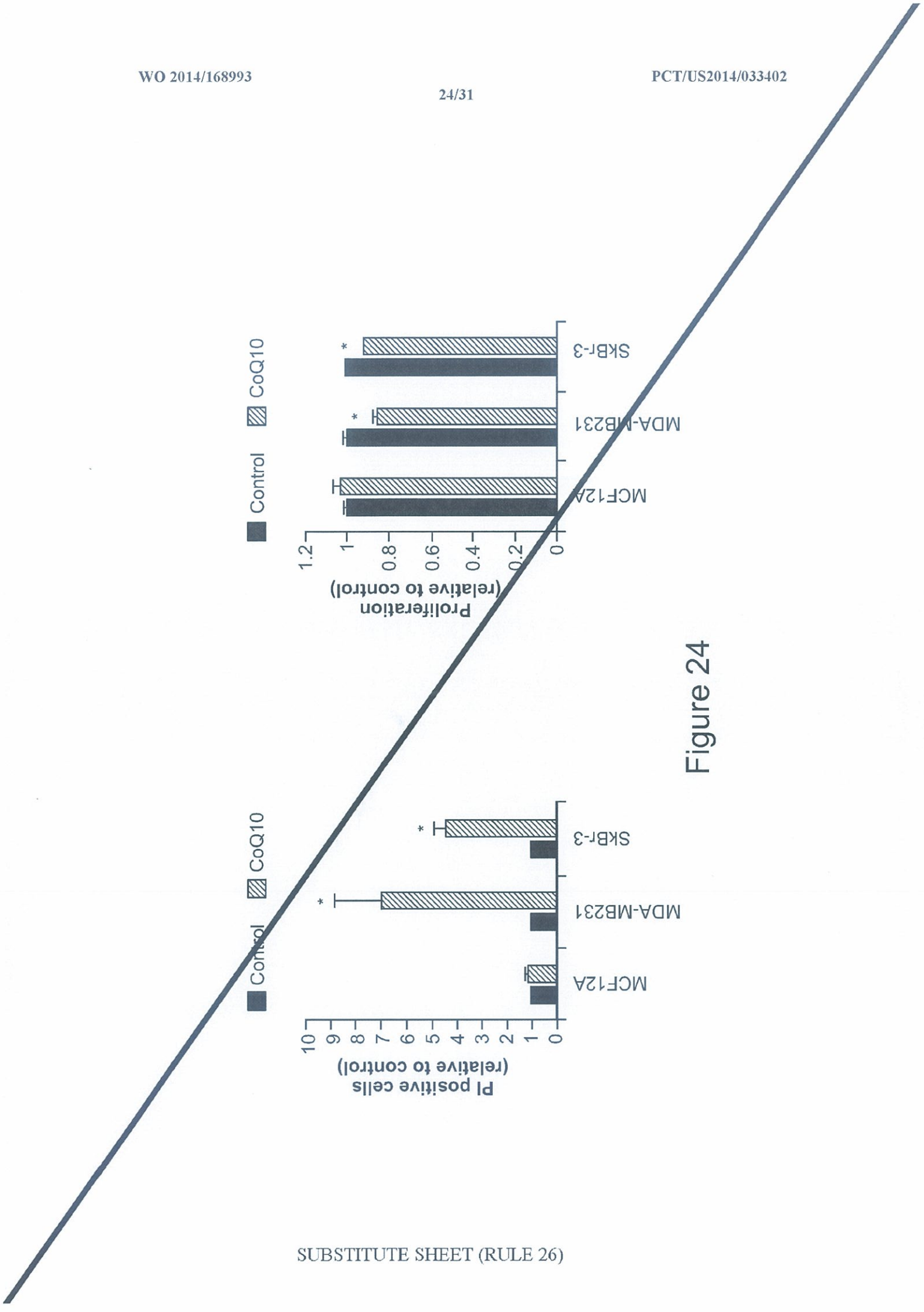

Control
CoQ10
PI positive cells
(relative to control)
0
1
2
3
4
5
6
7
8
9
10
MCF12A
MDA-MB231
SKBr-3
*
*
*
Control
CoQ10
Proliferation
(relative to control)
0
0.2
0.4
0.6
0.8
1
1.2
MCF12A
MDA-MB231
SKBr-3
*
*
*

Figure 24

Figure 25

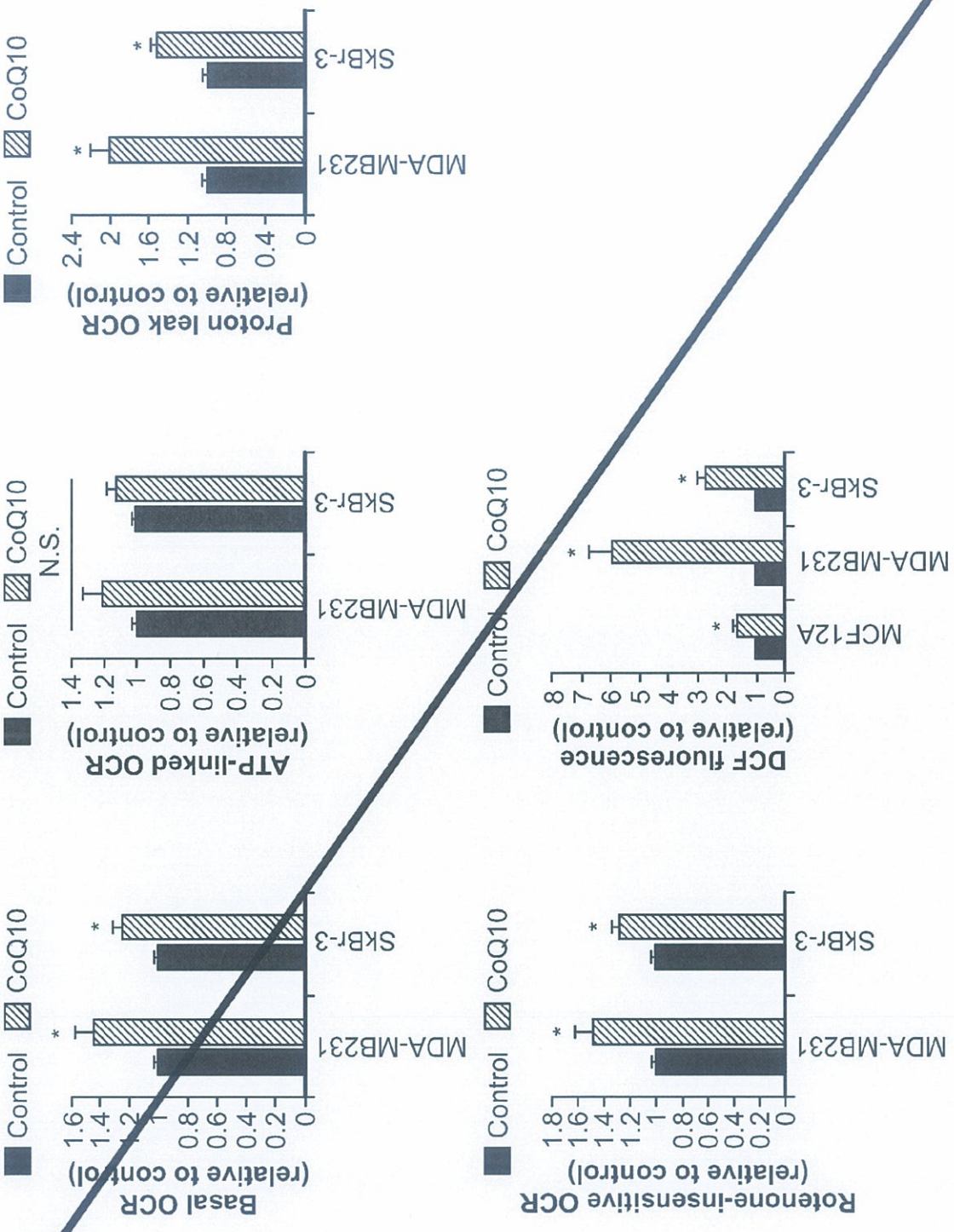
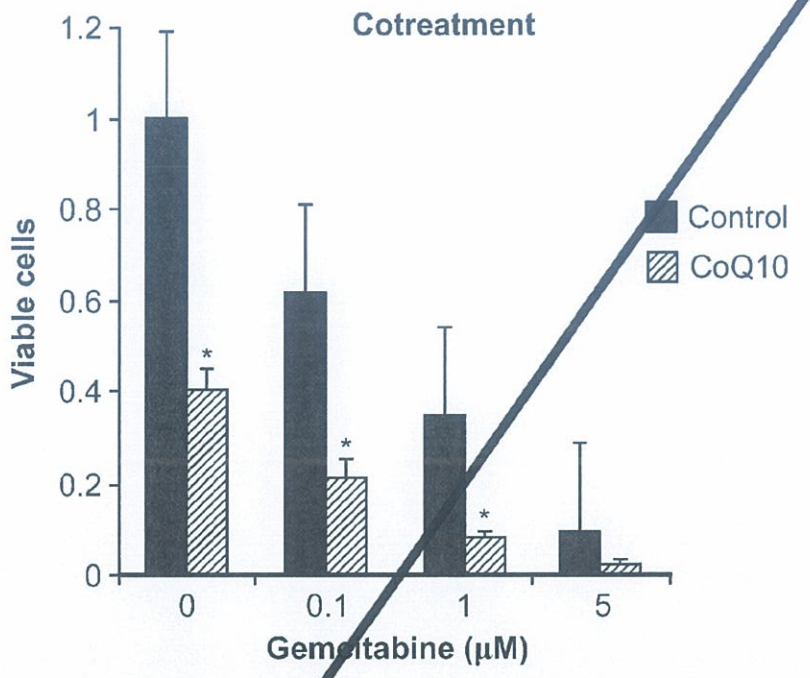
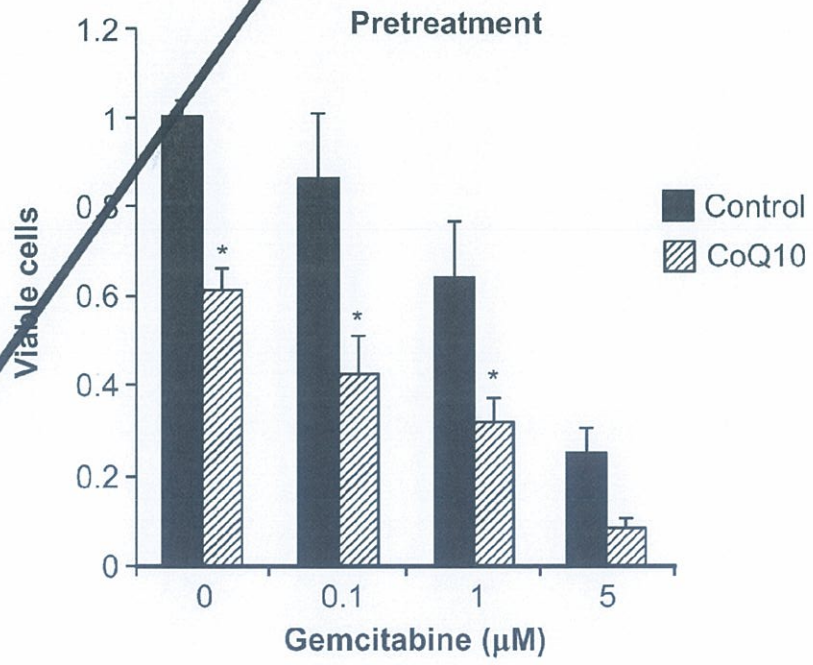

Control
CoQ10
Basal OCR
(relative to control)
MDA-MB231
SkBr-3
ATP-linked OCR
(relative to control)
N.S.
Proton leak OCR
(relative to control)
Rotenone-insensitive OCR
(relative to control)
DCF fluorescence
(relative to control)
MCF12A
*

Figure 26


Cotreatment
Viable cells
1.2
1
0.8
0.6
0.4
0.2
0
0
0.1
1
5
Gemcitabine (μM)
Control
CoQ10
*


Pretreatment
Viable cells
1.2
1
0.6
0.4
0.2
0
0
0.1
1
5
Gemcitabine (μM)
Control
CoQ10
*

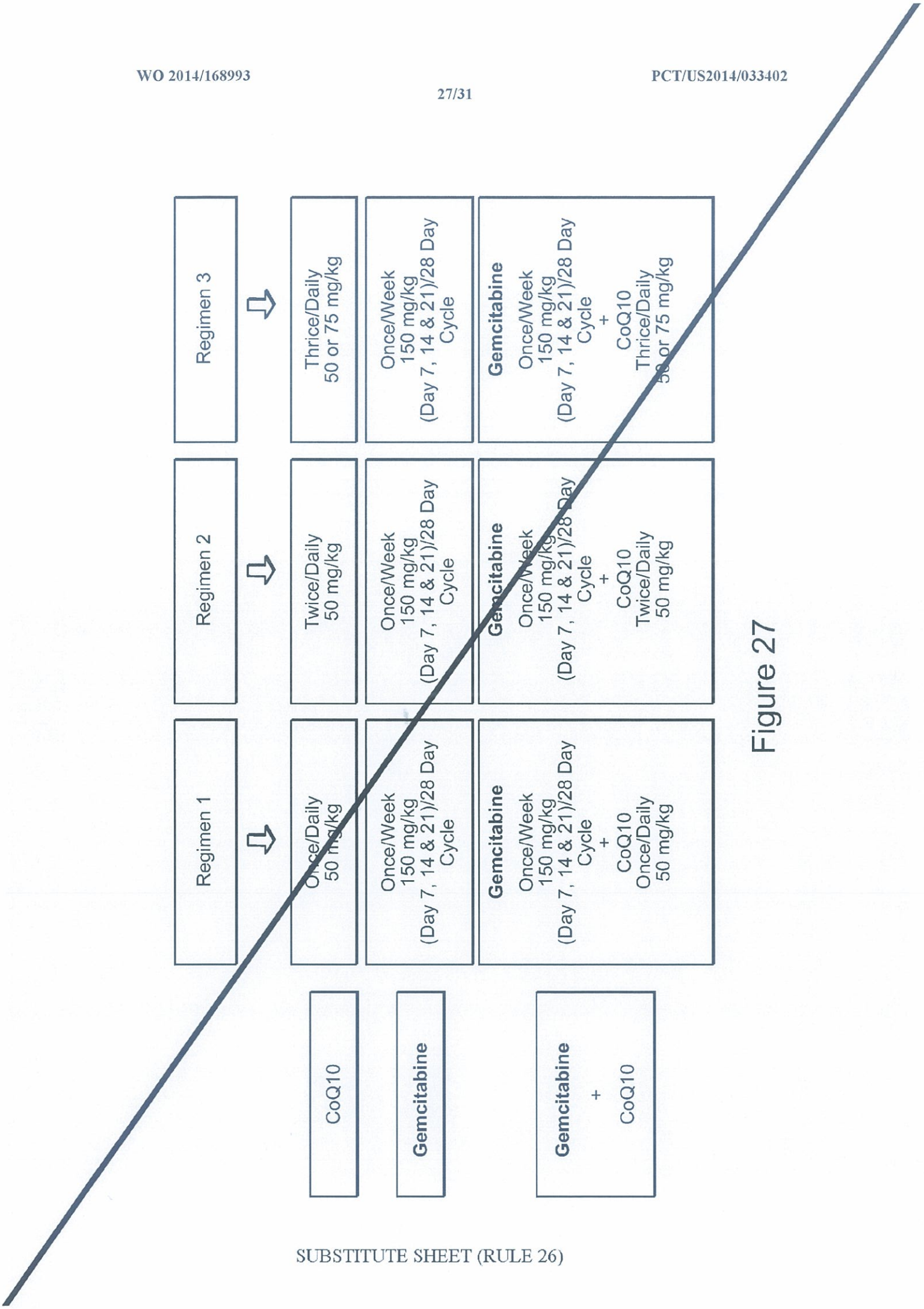

Regimen 1
Regimen 2
Regimen 3
CoQ10
Once/Daily 50 mg/kg
Twice/Daily 50 mg/kg
Thrice/Daily 50 or 75 mg/kg
Gemcitabine
Once/Week 150 mg/kg (Day 7, 14 & 21)/28 Day Cycle
Gemcitabine + CoQ10
Once/Week 150 mg/kg (Day 7, 14 & 21)/28 Day Cycle + CoQ10 Once/Daily 50 mg/kg
Once/Week 150 mg/kg (Day 7, 14 & 21)/28 Day Cycle + CoQ10 Twice/Daily 50 mg/kg
Once/Week 150 mg/kg (Day 7, 14 & 21)/28 Day Cycle + CoQ10 Thrice/Daily 50 or 75 mg/kg

Figure 27

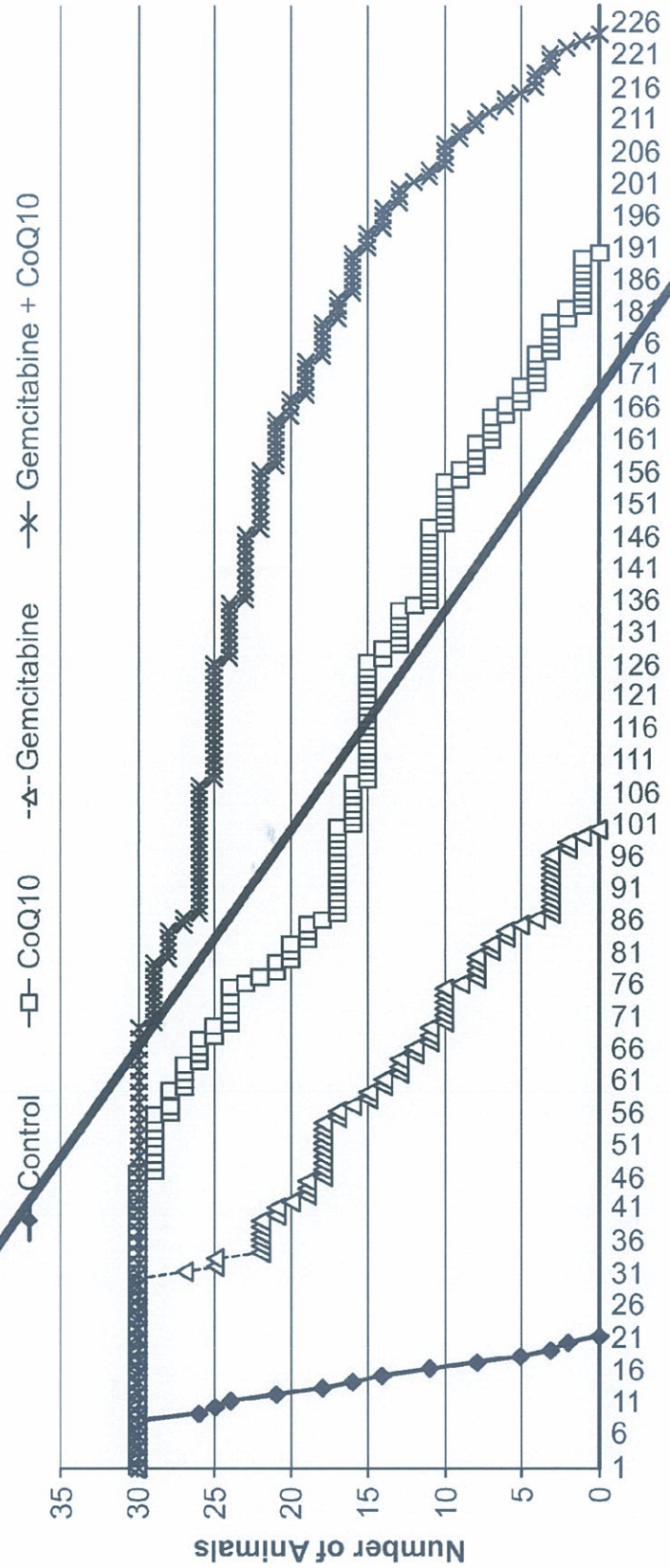

Control
CoQ10
Gemcitabine
Gemcitabine + CoQ10
Number of Animals
35
30
25
20
15
10
5
0
226
221
216
211
206
201
196
191
186
171
166
161
156
151
146
141
136
131
126
121
116
111
106
101
96
91
86
81
76
71
66
61
56
51
46
41
36
31
26
21
16
11
6
1

Figure 28

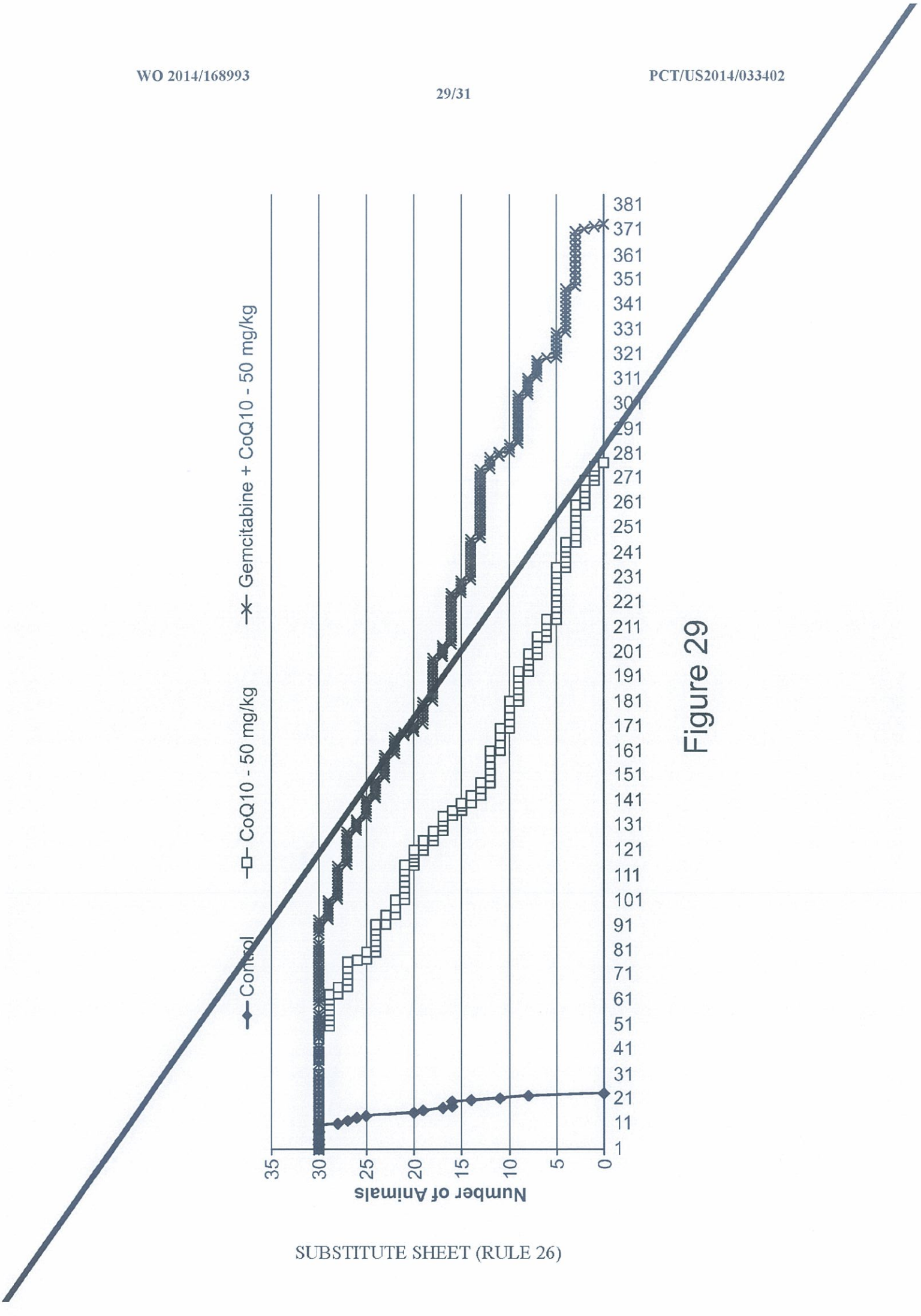

Control
CoQ10 - 50 mg/kg
Gemcitabine + CoQ10 - 50 mg/kg
Number of Animals
35
30
25
20
15
10
5
0
1
11
21
31
41
51
61
71
81
91
101
111
121
131
141
151
161
171
181
191
201
211
221
231
241
251
261
271
281
291
301
311
321
331
341
351
361
371
381

Figure 29

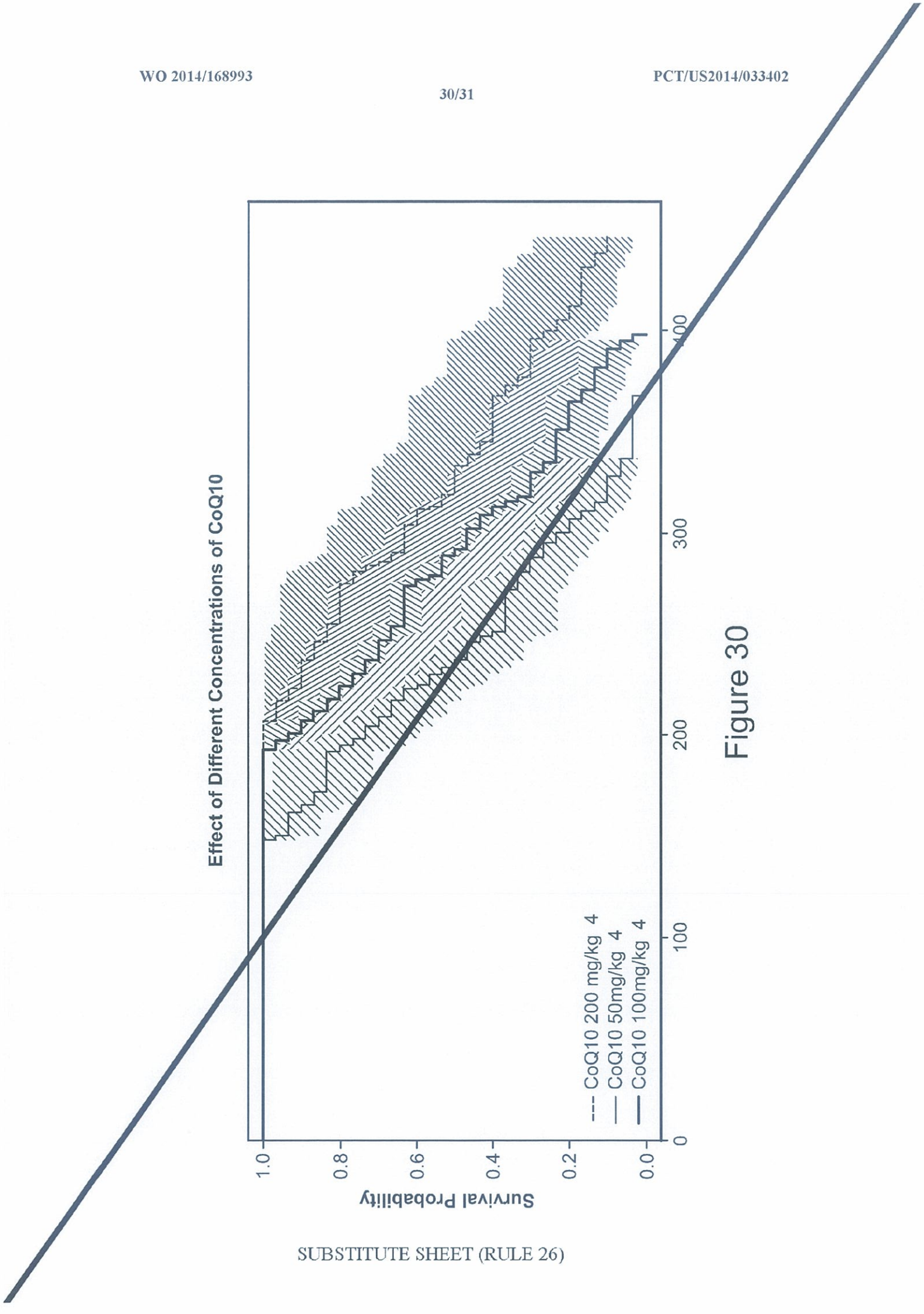

Effect of Different Concentrations of CoQ10
Survival Probability
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
CoQ10 200 mg/kg 4
CoQ10 50mg/kg 4
CoQ10 100mg/kg 4

Figure 30

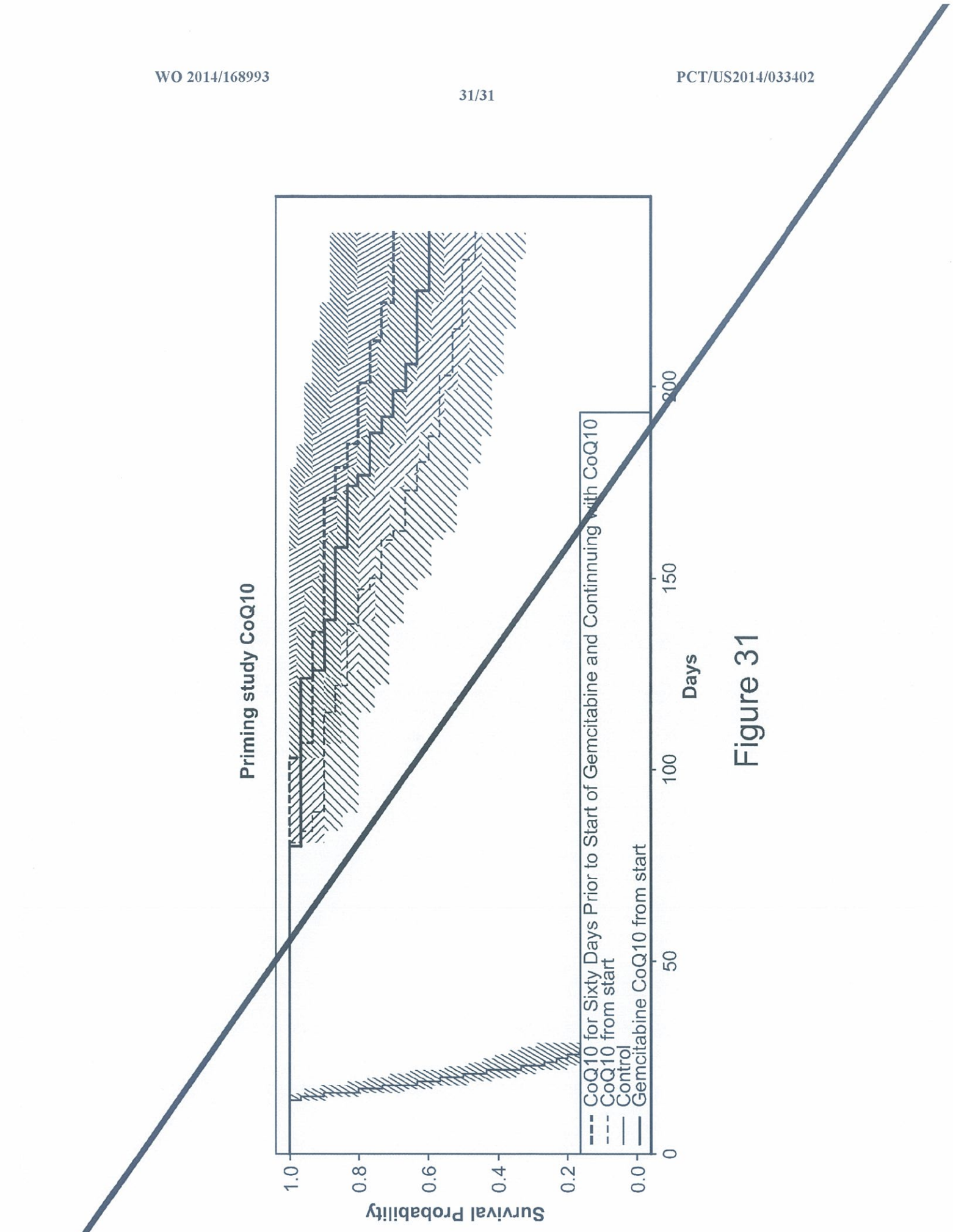

Priming study CoQ10
Survival Probability
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
Days
CoQ10 for Sixty Days Prior to Start of Gemcitabine and Continuing with CoQ10
CoQ10 from start
Control
Gemcitabine CoQ10 from start

Figure 31

Figure 1

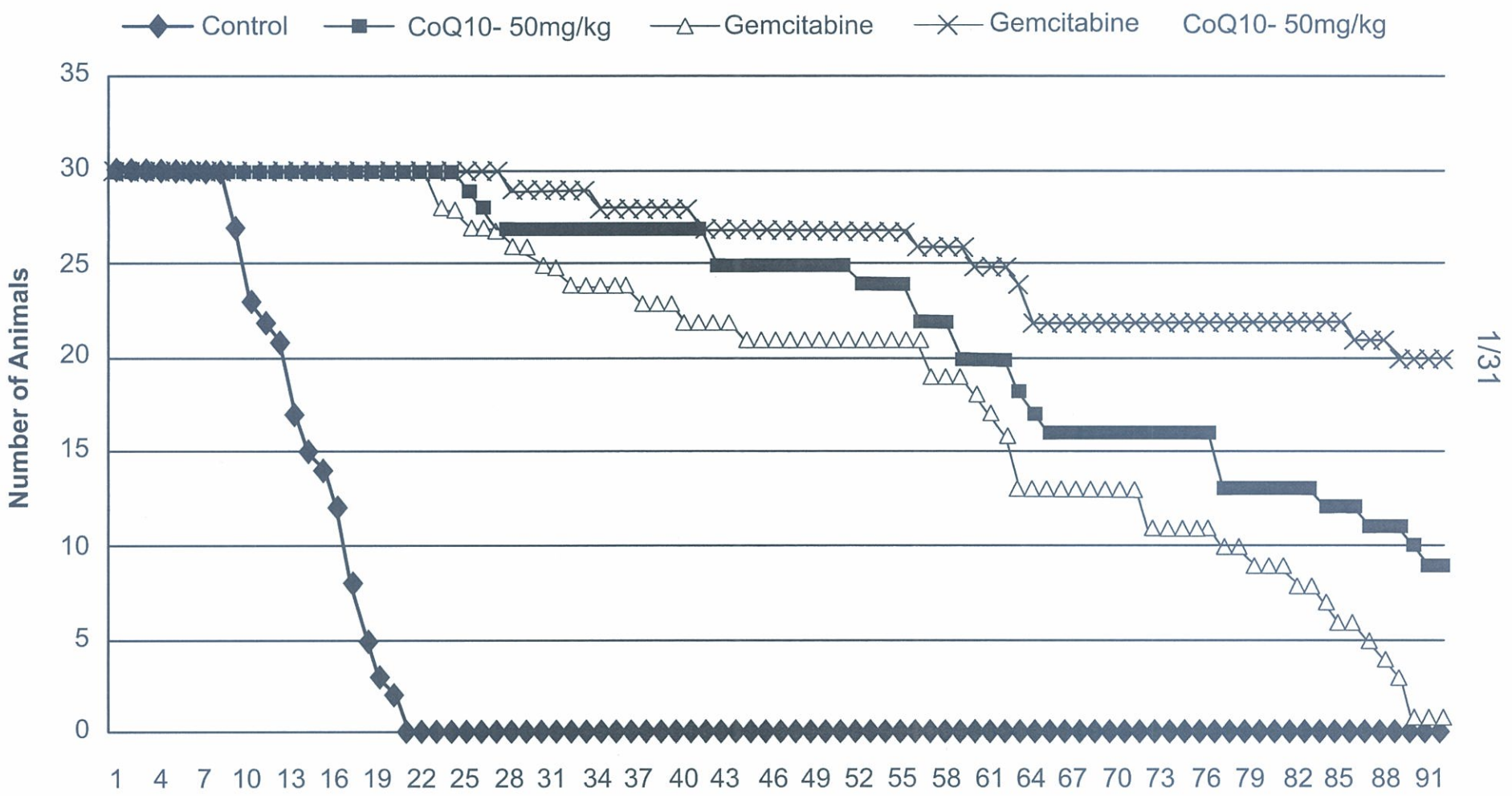

Control
CoQ10- 50mg/kg
Gemcitabine
Gemcitabine
CoQ10- 50mg/kg
Number of Animals
35
30
25
20
15
10
5
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91
1/31

Figure 2

EFFECT OF COENZYME Q10 ON PANCREATIC TUMOR SIZE

Group 1	**Group 2**	**Group 3**	**Group 4**
Control	Coenzyme Q10	Gemcitabine	Gem + CoQ10
20 Days	50-60 Days	40-50 Days	50-60 Days

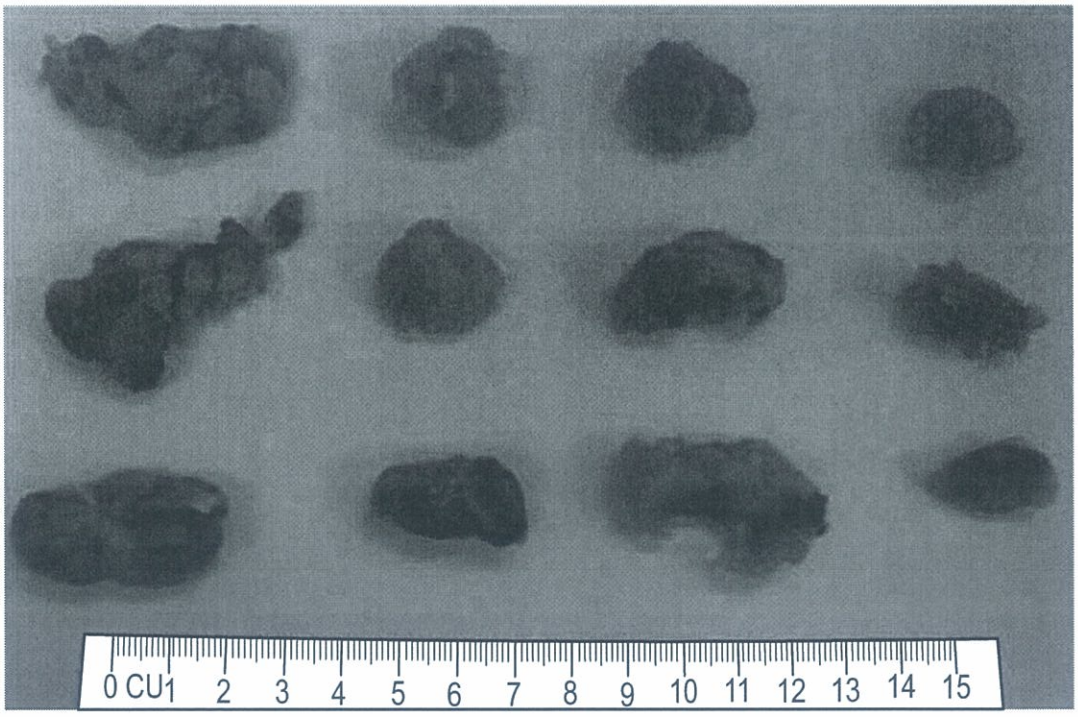


Figure 3

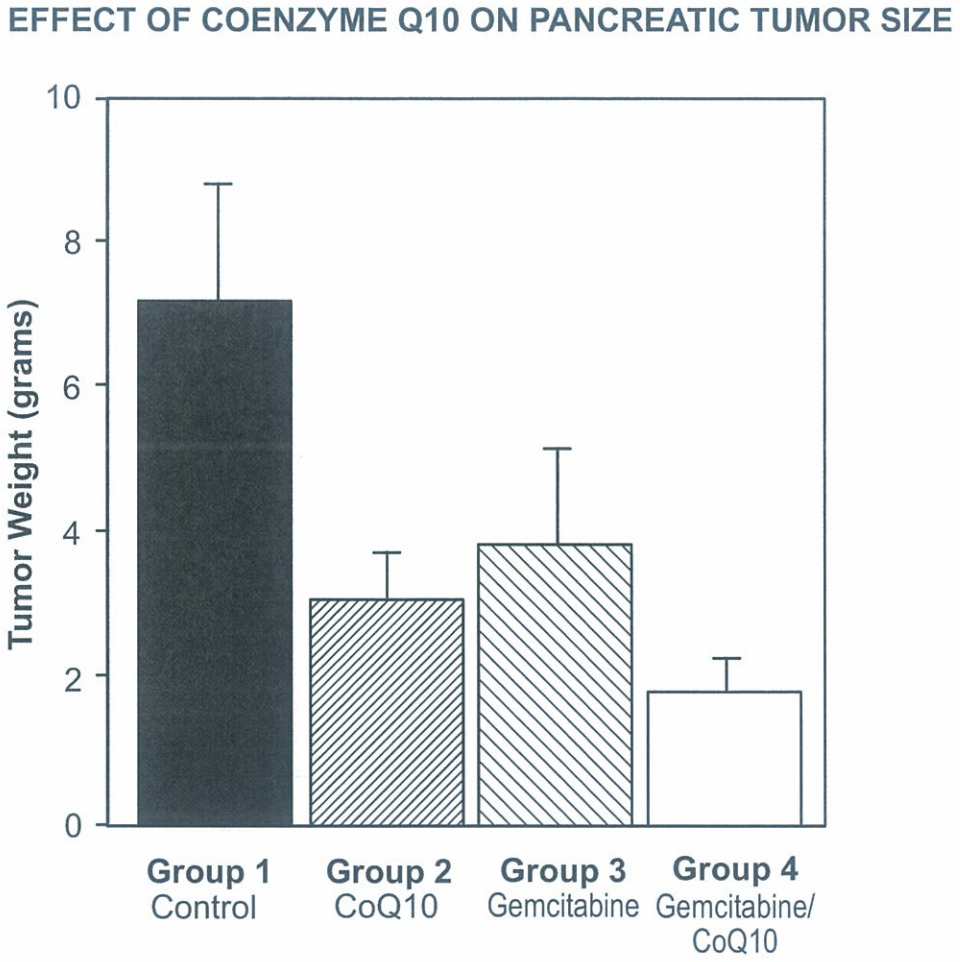

EFFECT OF COENZYME Q10 ON PANCREATIC TUMOR SIZE
Tumor Weight (grams)
10
8
6
4
2
0
Group 1
Control
Group 2
CoQ10
Group 3
Gemcitabine
Group 4
Gemcitabine/
CoQ10

Figure 4

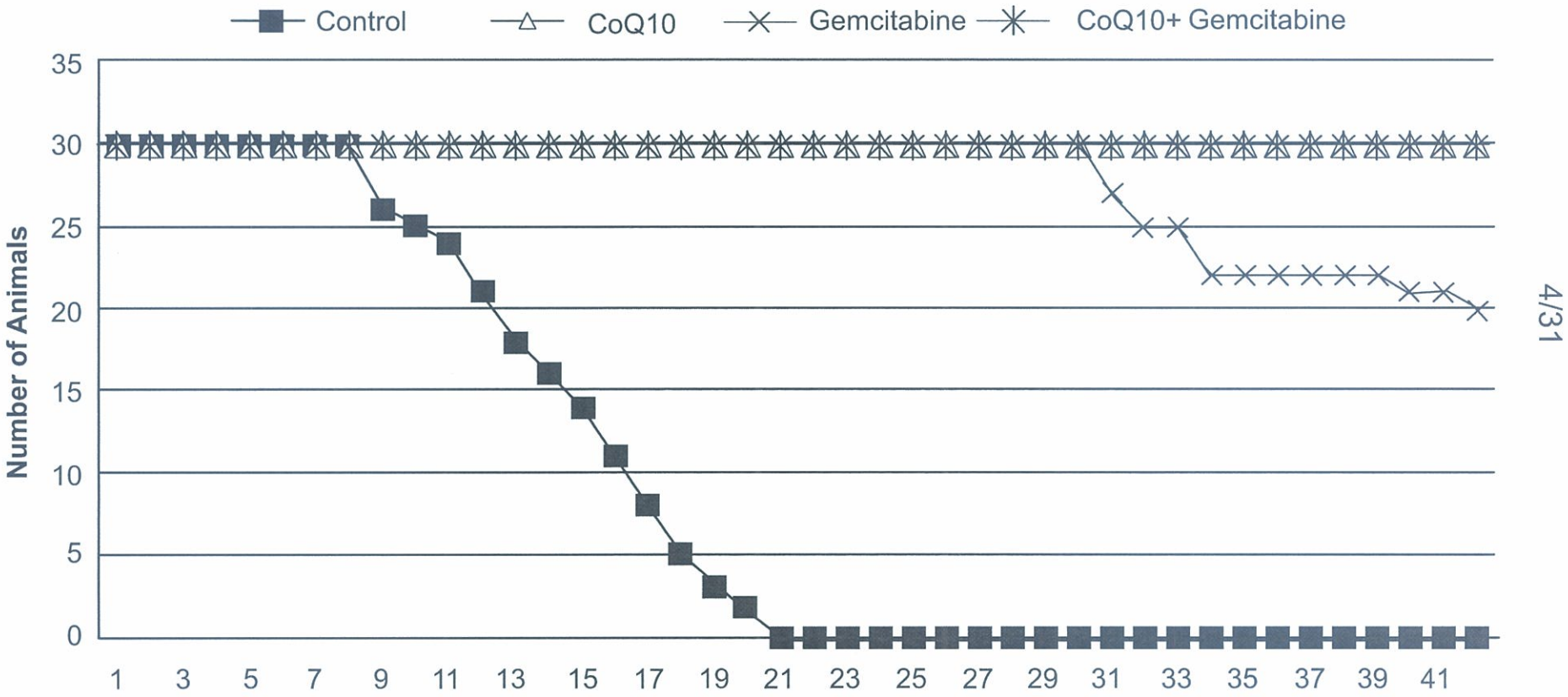

Control
CoQ10
Gemcitabine
CoQ10+ Gemcitabine
Number of Animals
35
30
25
20
15
10
5
0
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41

Figure 5A

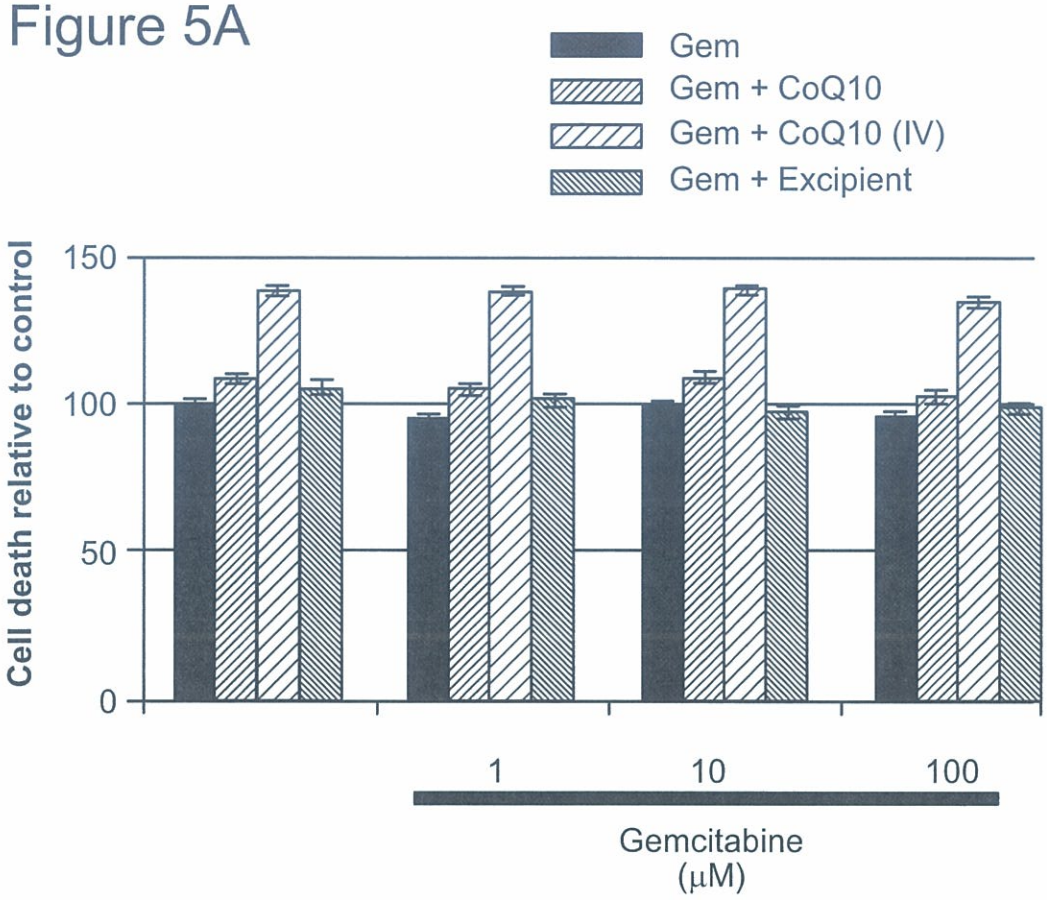


Figure 5B

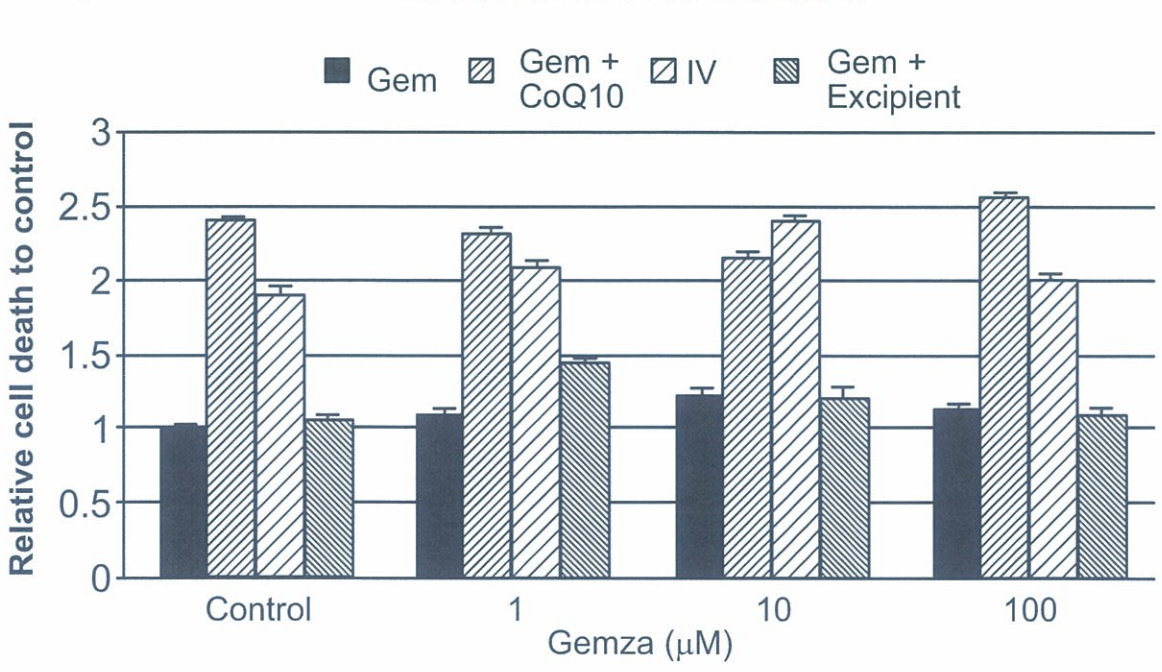


Figure 6A

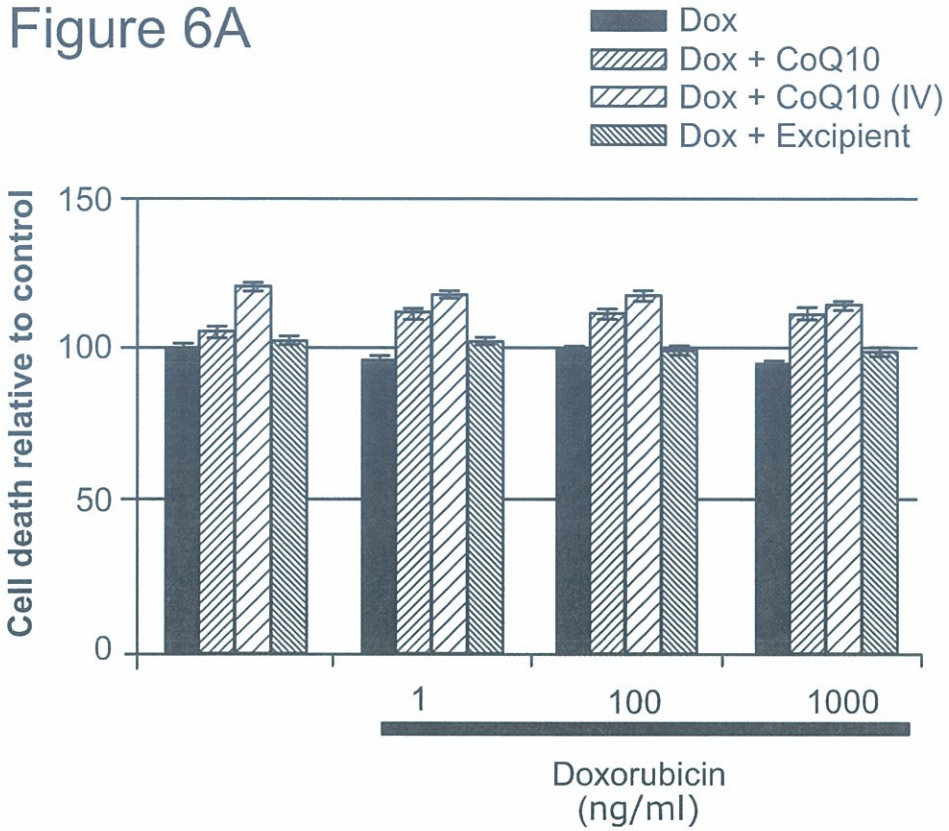


Figure 6B

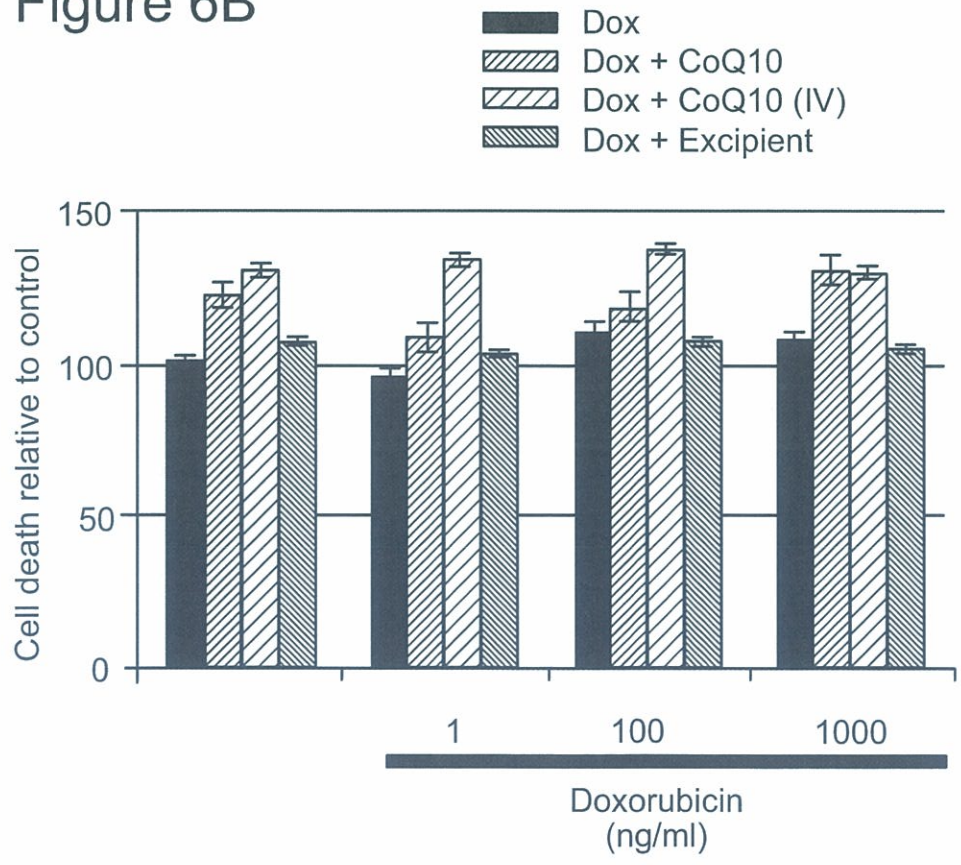


Figure 7

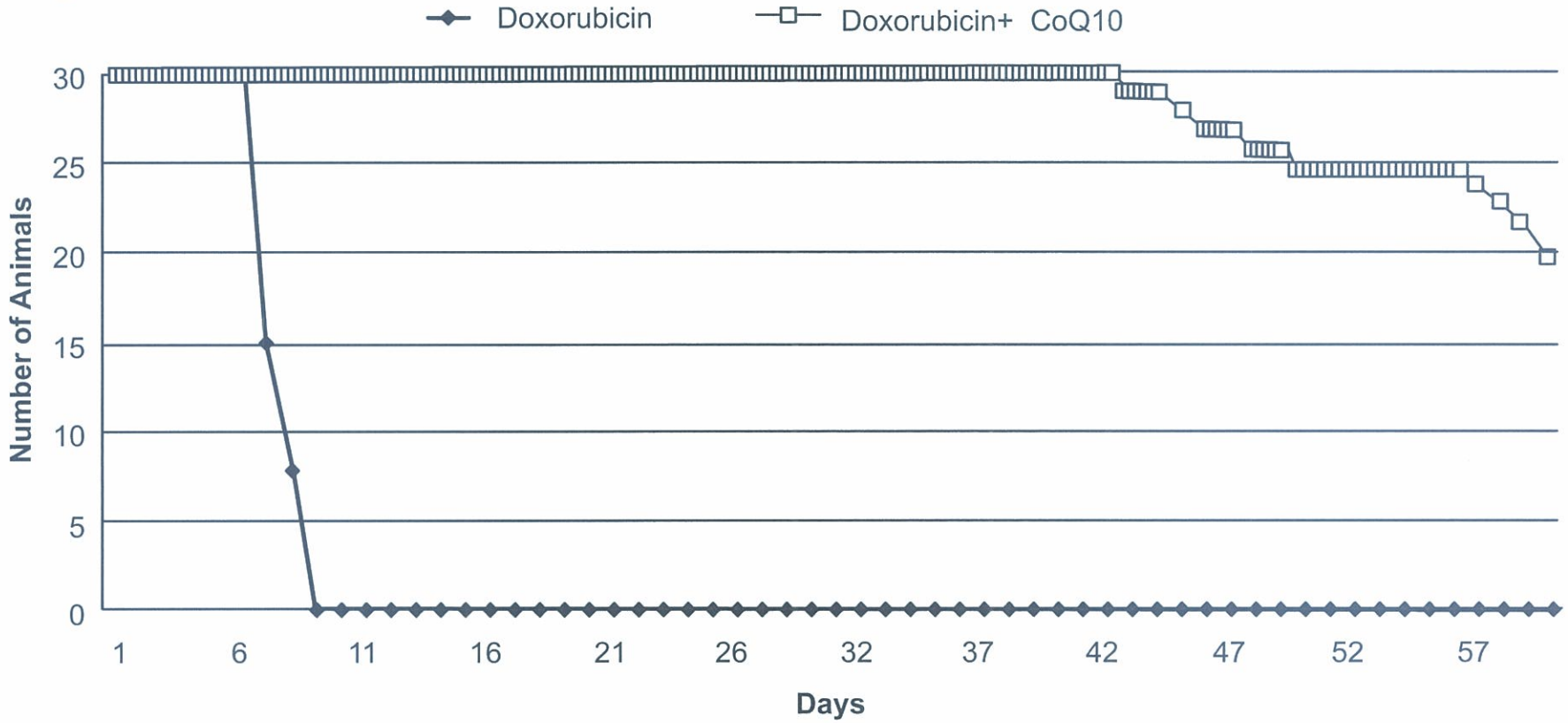
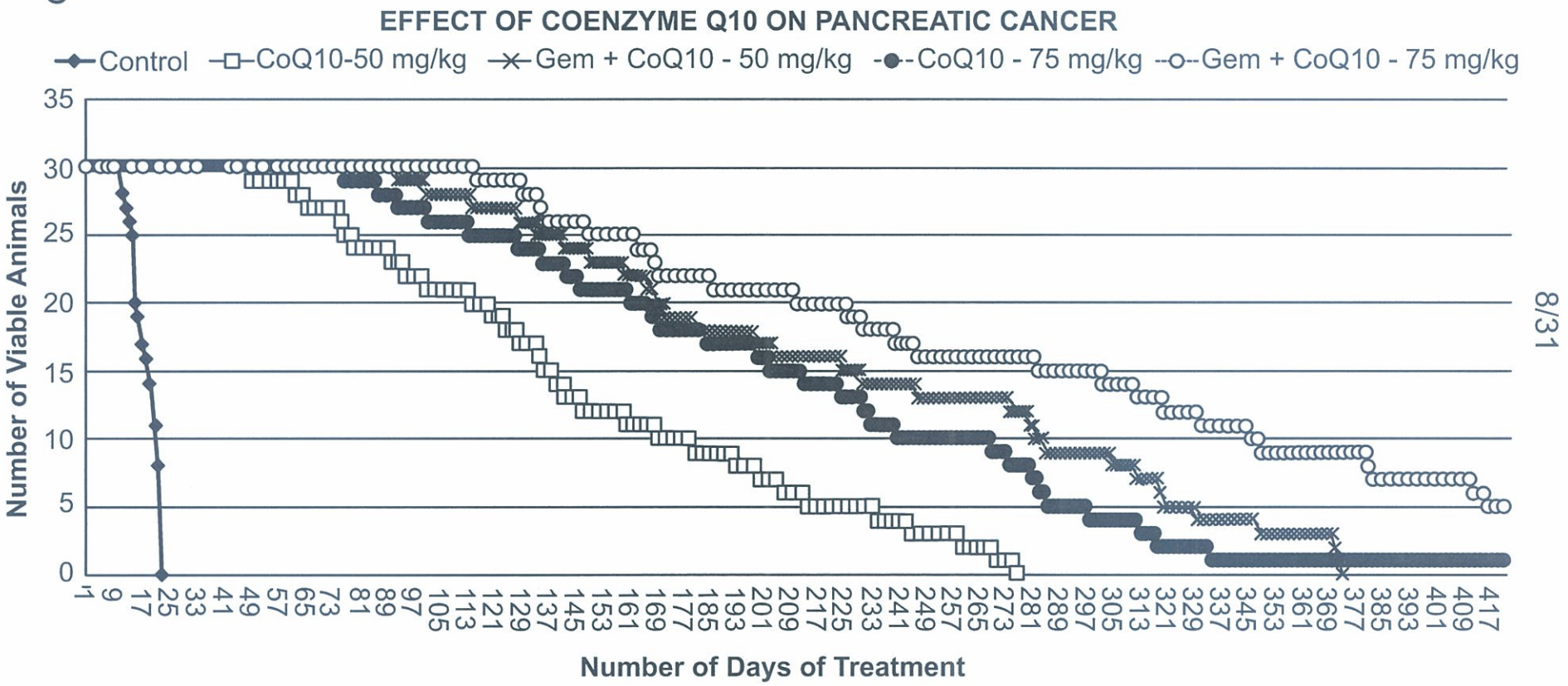

Doxorubicin
Doxorubicin+ CoQ10
Number of Animals
30
25
20
15
10
5
0
1
6
11
16
21
26
32
37
42
47
52
57
Days

Figure 8


EFFECT OF COENZYME Q10 ON PANCREATIC CANCER
Control
CoQ10-50 mg/kg
Gem + CoQ10 - 50 mg/kg
CoQ10 - 75 mg/kg
Gem + CoQ10 - 75 mg/kg
Number of Viable Animals
0
5
10
15
20
25
30
35
1
9
17
25
33
41
49
57
65
73
81
89
97
105
113
121
129
137
145
153
161
169
177
185
193
201
209
217
225
233
241
249
257
265
273
281
289
297
305
313
321
329
337
345
353
361
369
377
385
393
401
409
417
Number of Days of Treatment

8/31

Figure 9A

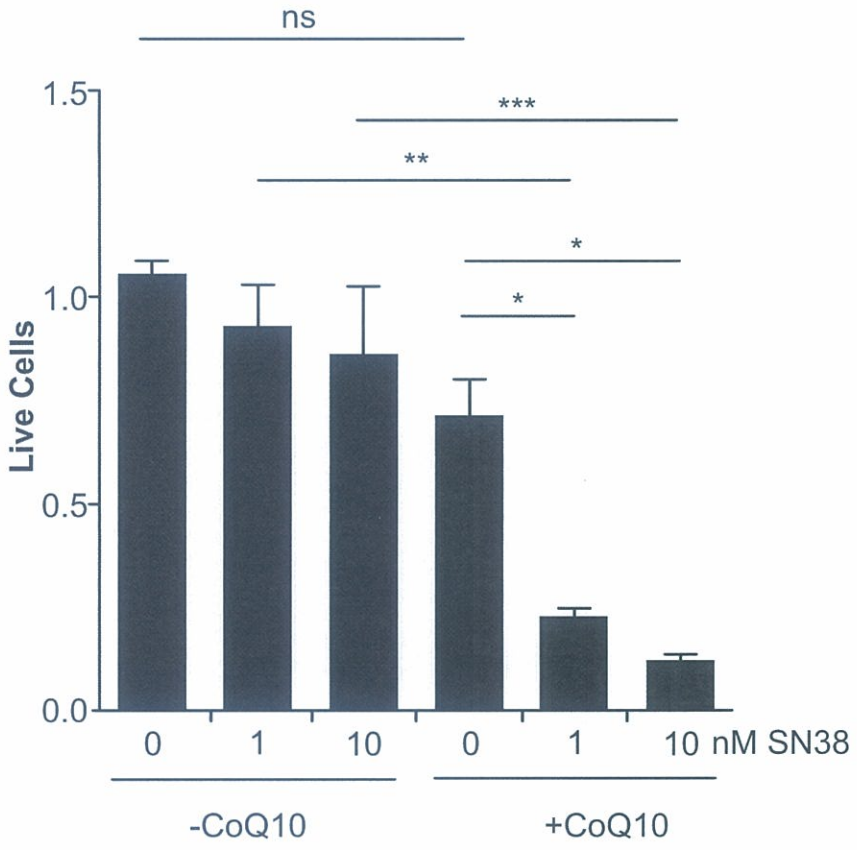


Figure 9B

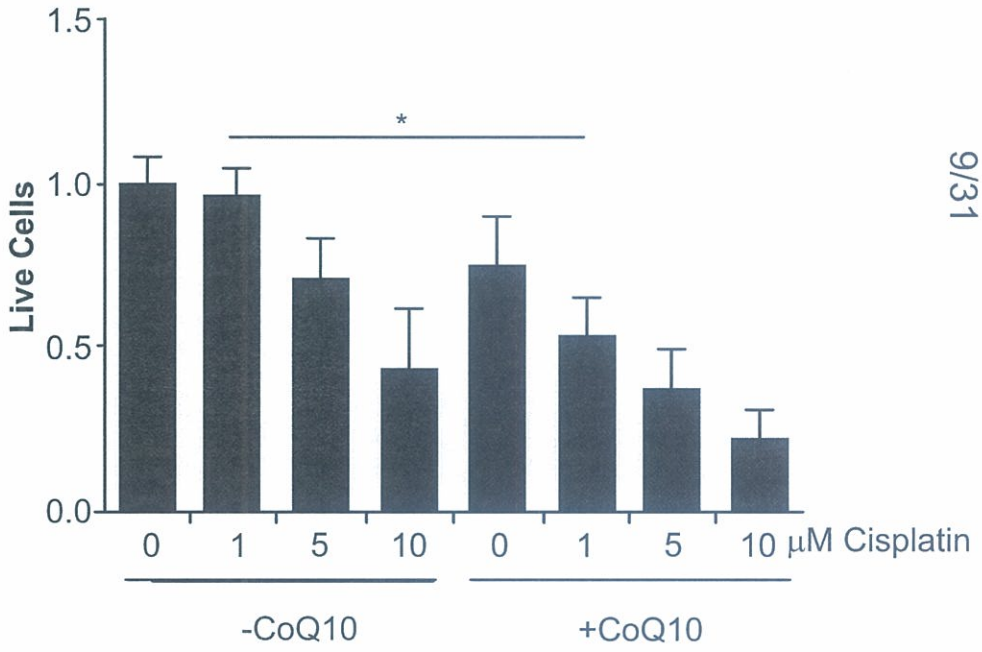


Figure 9C

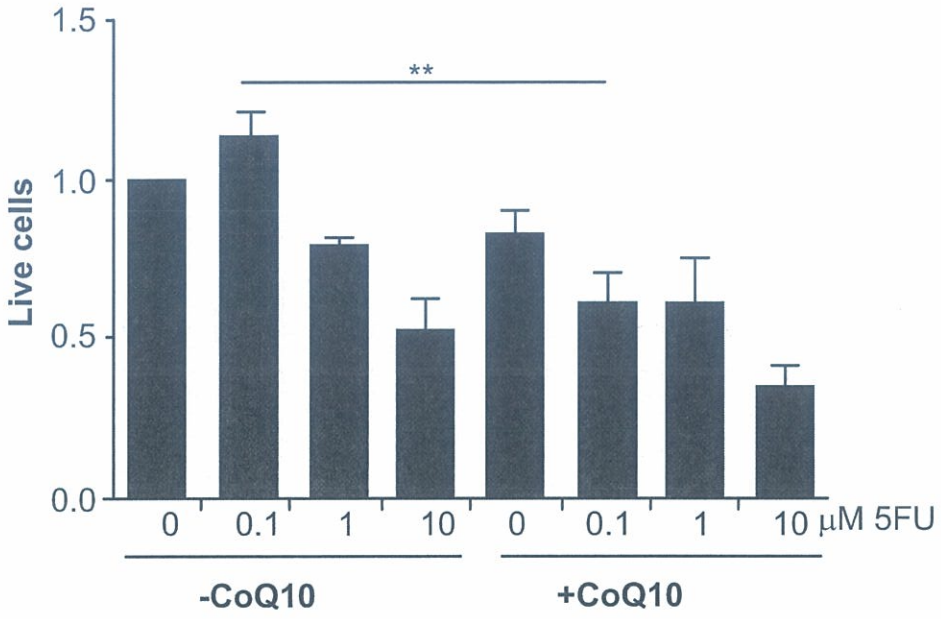


Figure 10

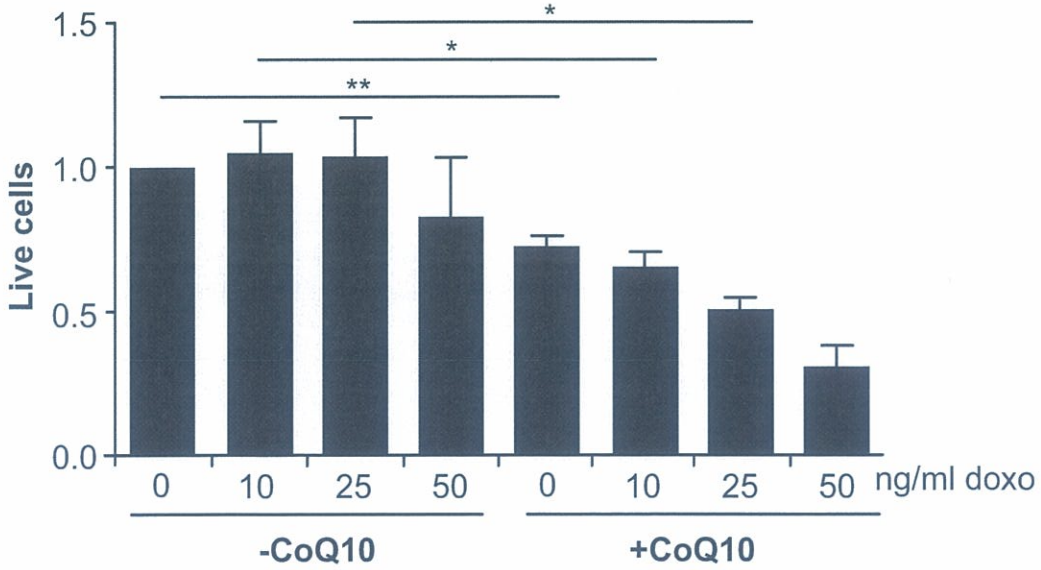
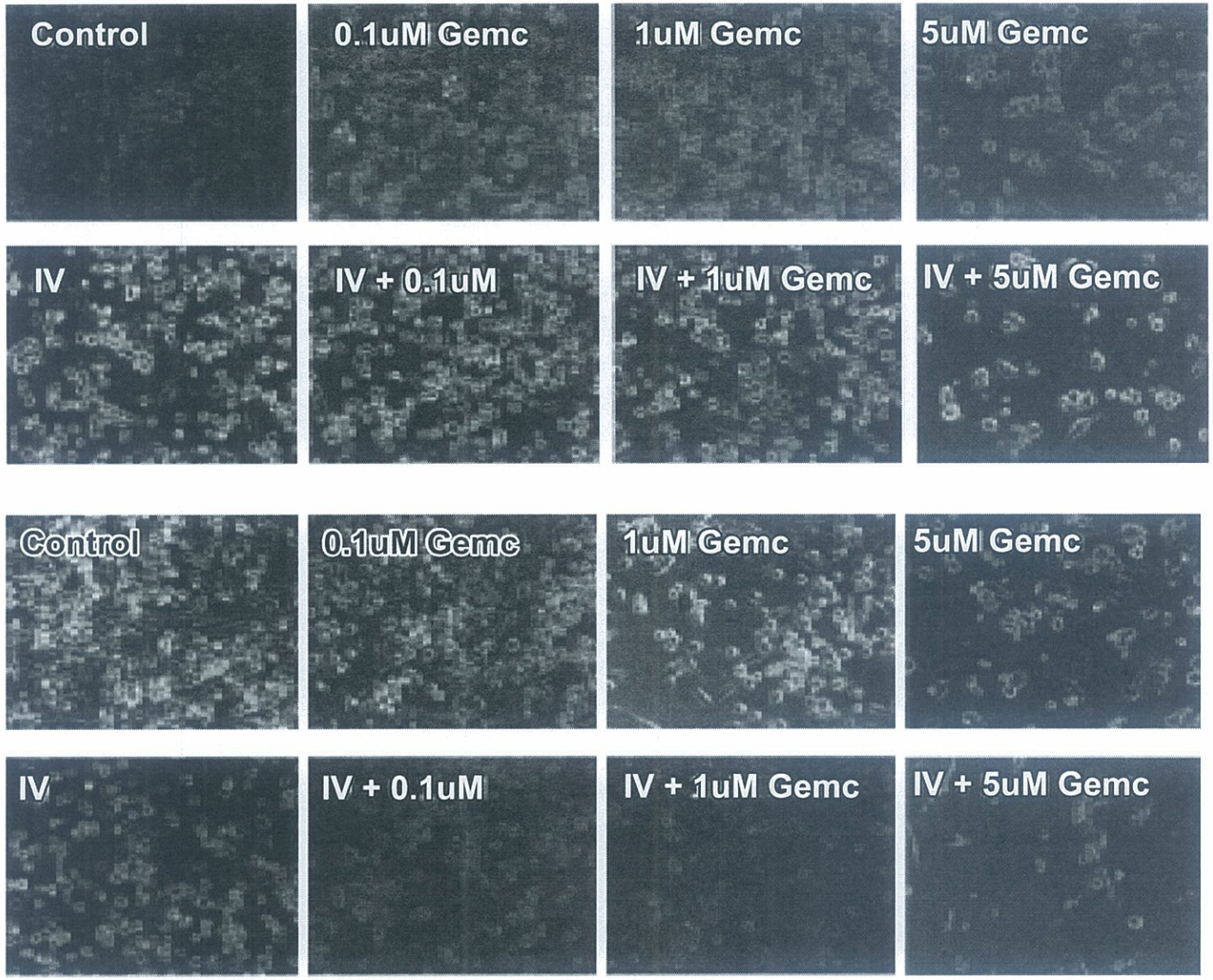


Figure 11


A
Control
0.1uM Gemc
1uM Gemc
5uM Gemc
IV
IV + 0.1uM
IV + 1uM Gemc
IV + 5uM Gemc
B
Control
0.1uM Gemc
1uM Gemc
5uM Gemc
IV
IV + 0.1uM
IV + 1uM Gemc
IV + 5uM Gemc

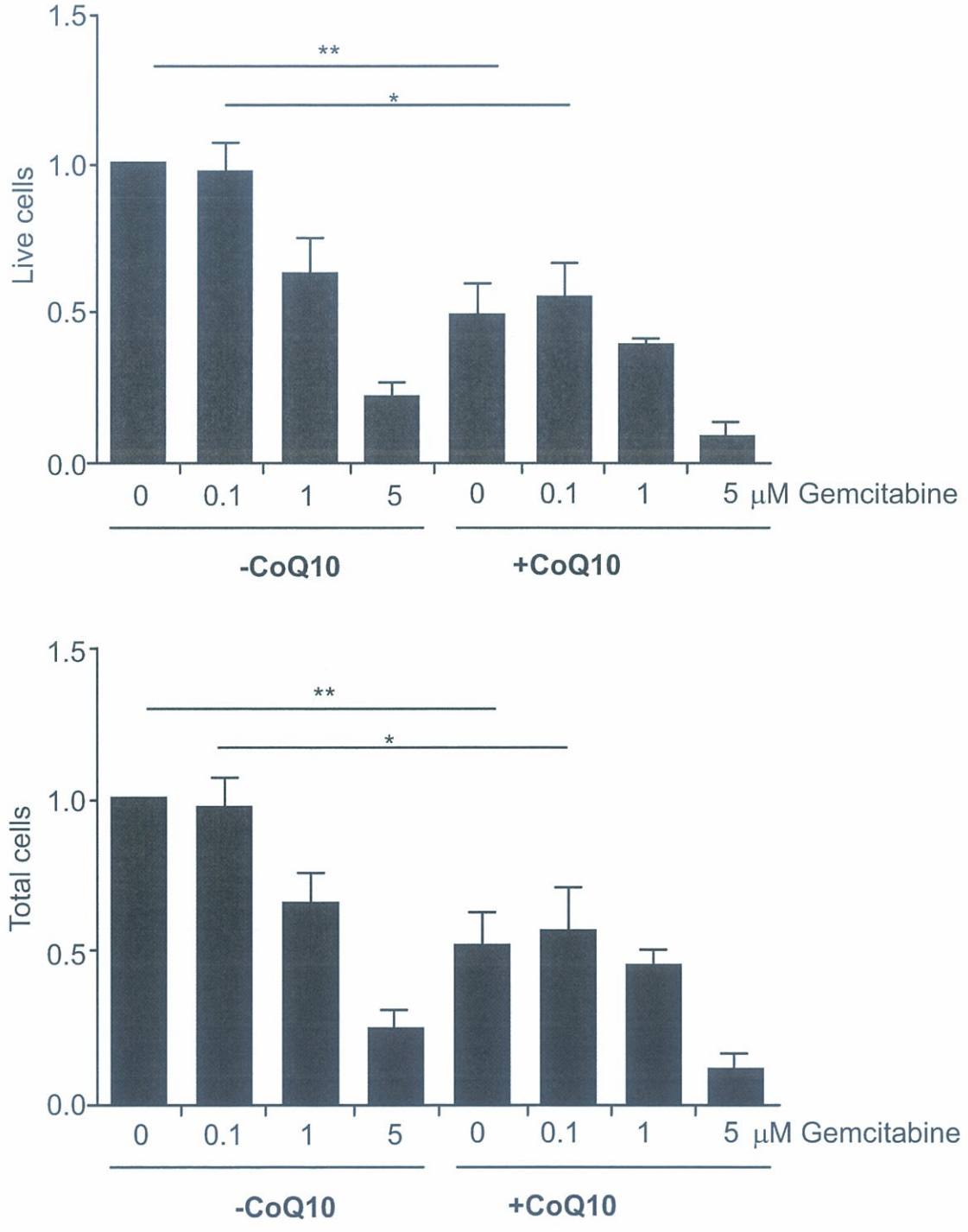

1.5
1.0
0.5
0.0
Live cells
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10
1.5
1.0
0.5
0.0
Total cells
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10

Figure 12A

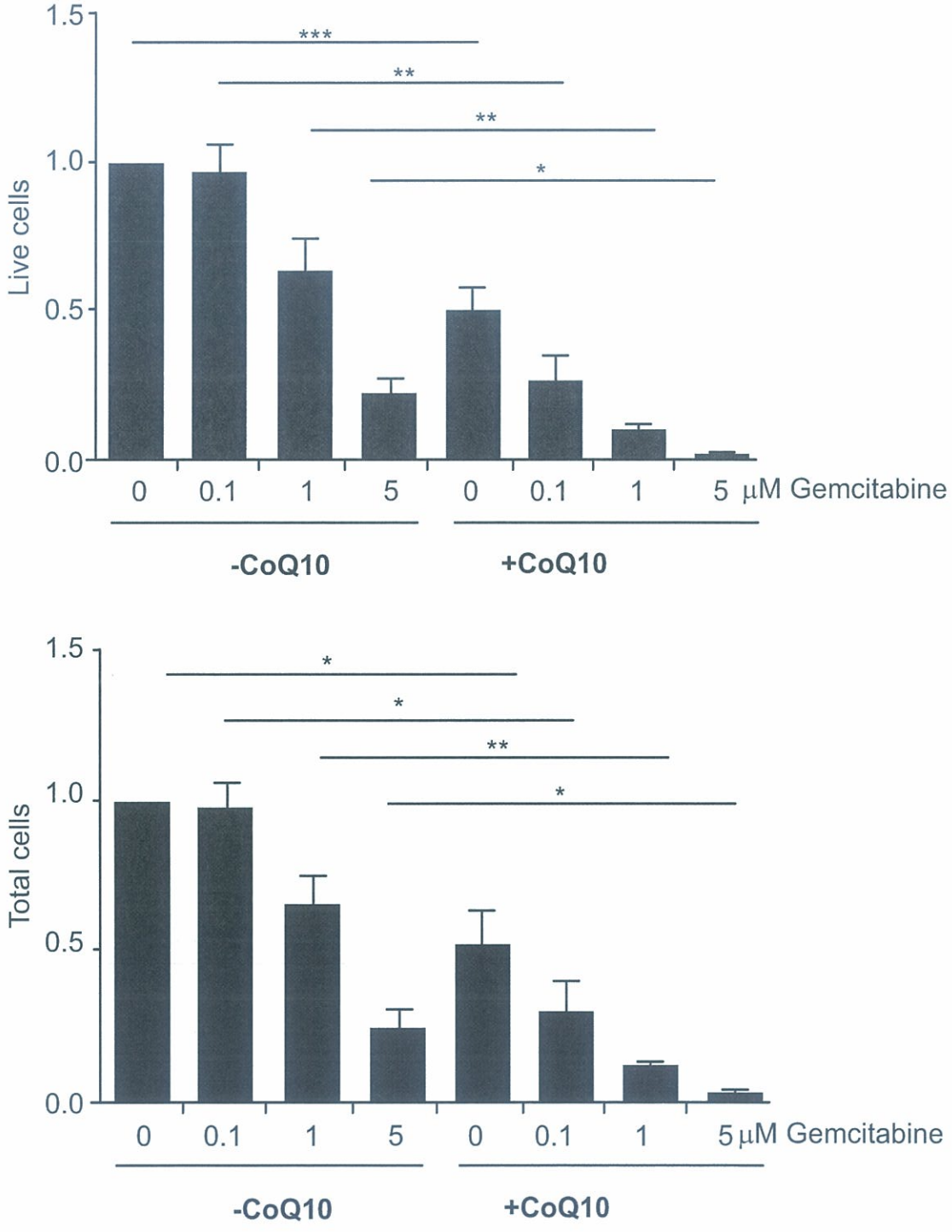

1.5
1.0
0.5
0.0
Live cells
***
**
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10
1.5
1.0
0.5
0.0
Total cells
*
*
**
*
0
0.1
1
5
0
0.1
1
5 μM Gemcitabine
-CoQ10
+CoQ10

Figure 12B

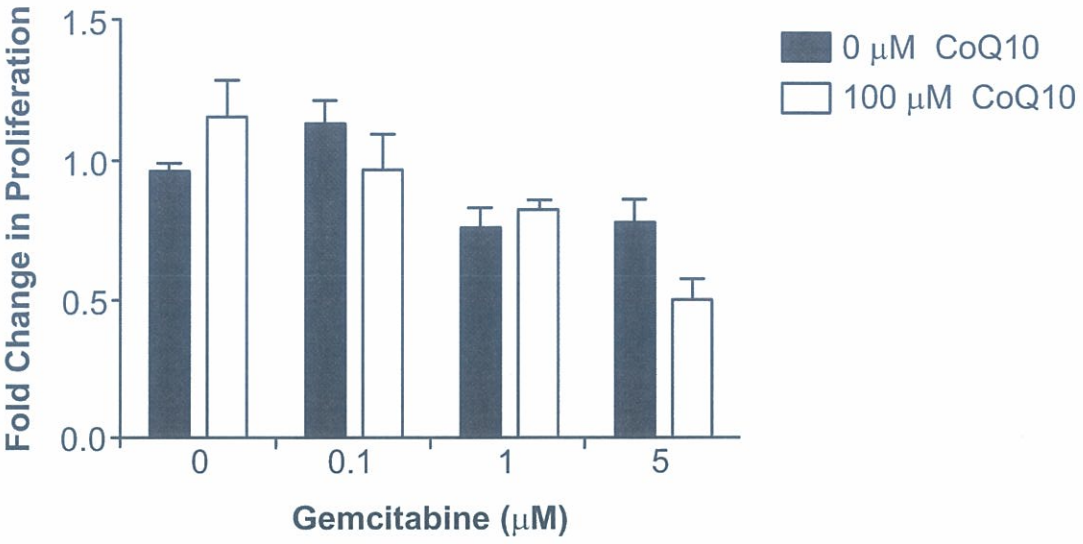


Figure 13

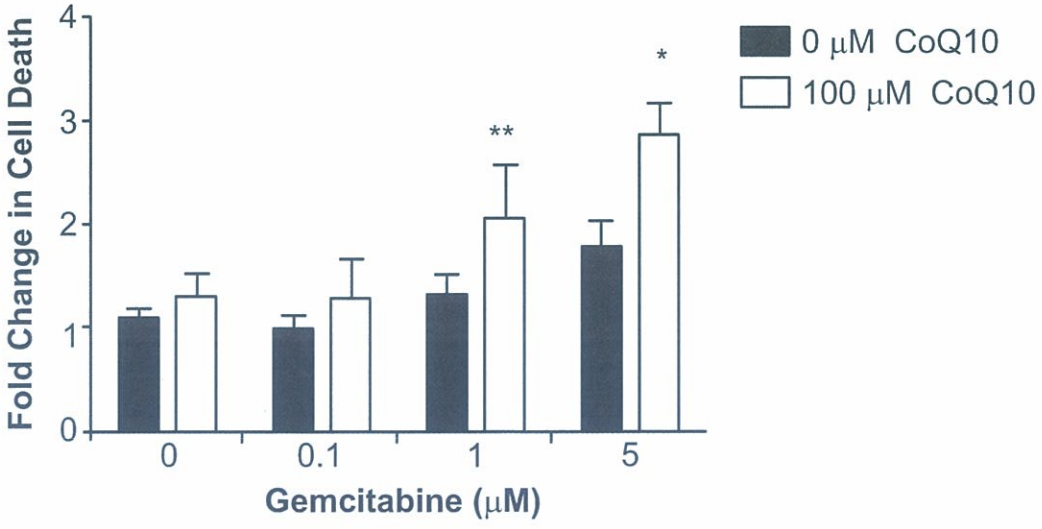


Figure 14

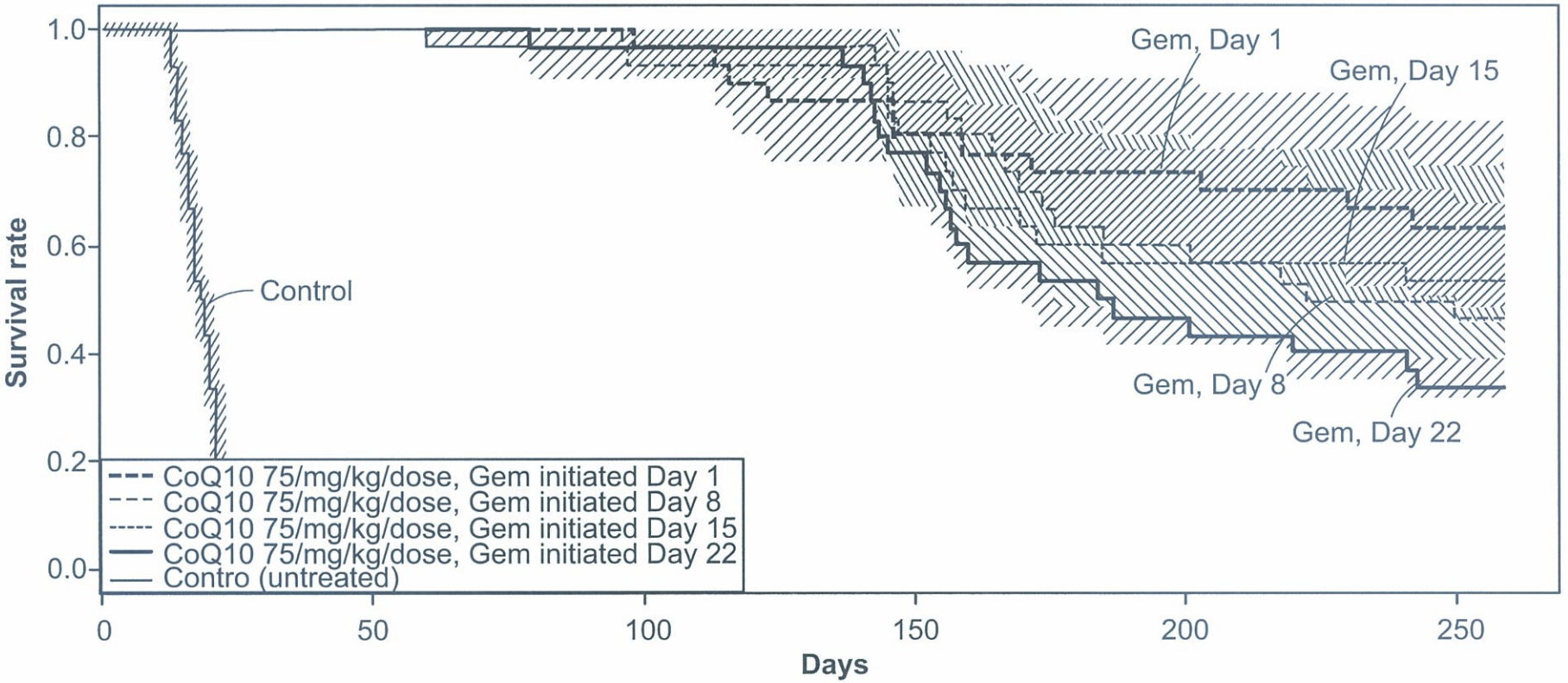

1.0
0.8
0.6
0.4
0.2
0.0
Survival rate
Control
Gem, Day 1
Gem, Day 15
Gem, Day 8
Gem, Day 22
CoQ10 75/mg/kg/dose, Gem initiated Day 1
CoQ10 75/mg/kg/dose, Gem initiated Day 8
CoQ10 75/mg/kg/dose, Gem initiated Day 15
CoQ10 75/mg/kg/dose, Gem initiated Day 22
Contro (untreated)
0
50
100
150
200
250
Days

Figure 15

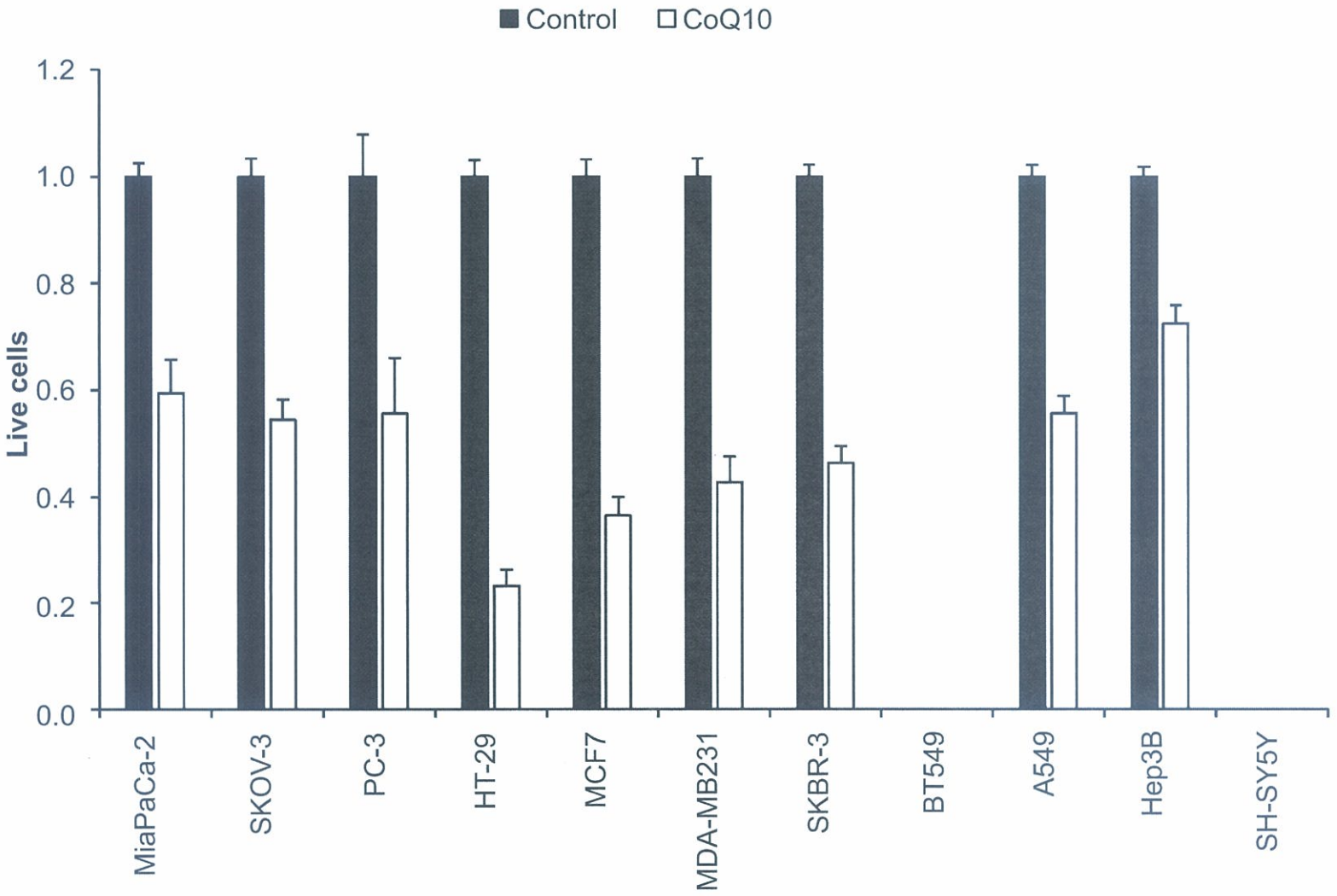

Control
CoQ10
Live cells
1.2
1.0
0.8
0.6
0.4
0.2
0.0
MiaPaCa-2
SKOV-3
PC-3
HT-29
MCF7
MDA-MB231
SKBR-3
BT549
A549
Hep3B
SH-SY5Y

Figure 16

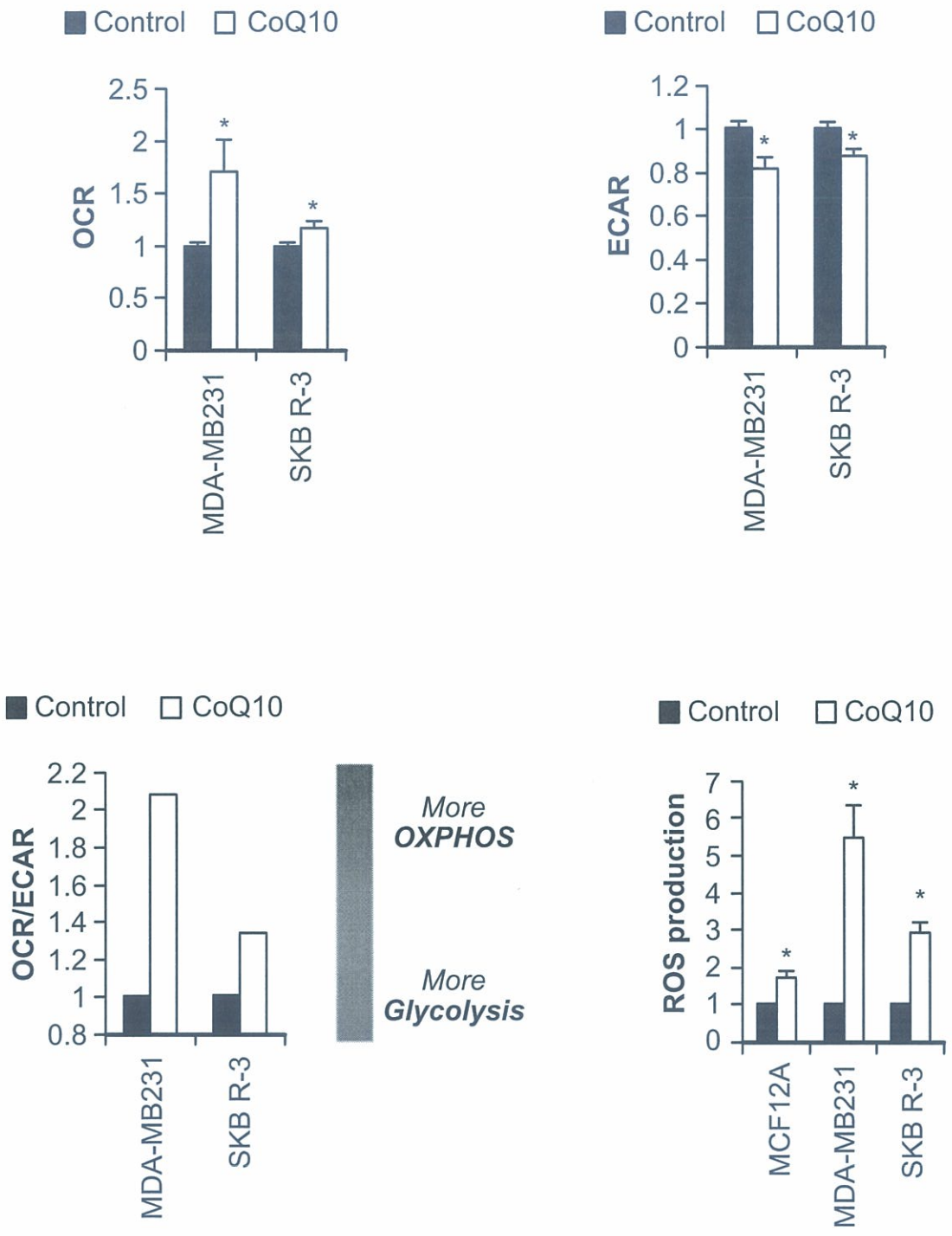

Control
CoQ10
OCR
2.5
2
1.5
1
0.5
0
*
*
MDA-MB231
SKB R-3
Control
CoQ10
ECAR
1.2
1
0.8
0.6
0.4
0.2
0
*
*
MDA-MB231
SKB R-3
Control
CoQ10
OCR/ECAR
2.2
2
1.8
1.6
1.4
1.2
1
0.8
MDA-MB231
SKB R-3
More
OXPHOS
More
Glycolysis
Control
CoQ10
ROS production
7
6
5
4
3
2
1
0
*
*
*
MCF12A
MDA-MB231
SKB R-3

Figure 17

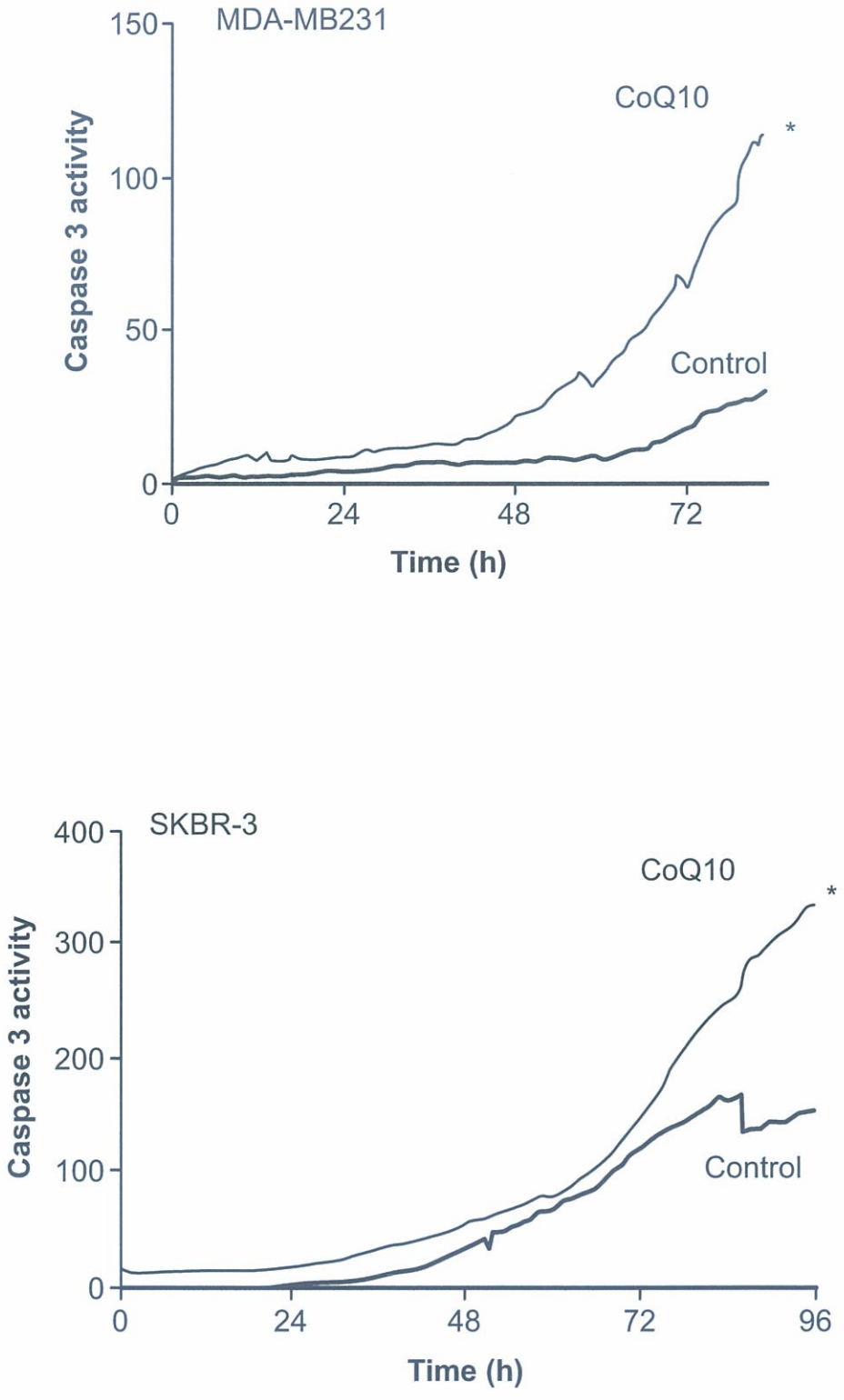

MDA-MB231
CoQ10
Control
*
Caspase 3 activity
150
100
50
0
0
24
48
72
Time (h)
SKBR-3
CoQ10
Control
*
Caspase 3 activity
400
300
200
100
0
0
24
48
72
96
Time (h)

Figure 18

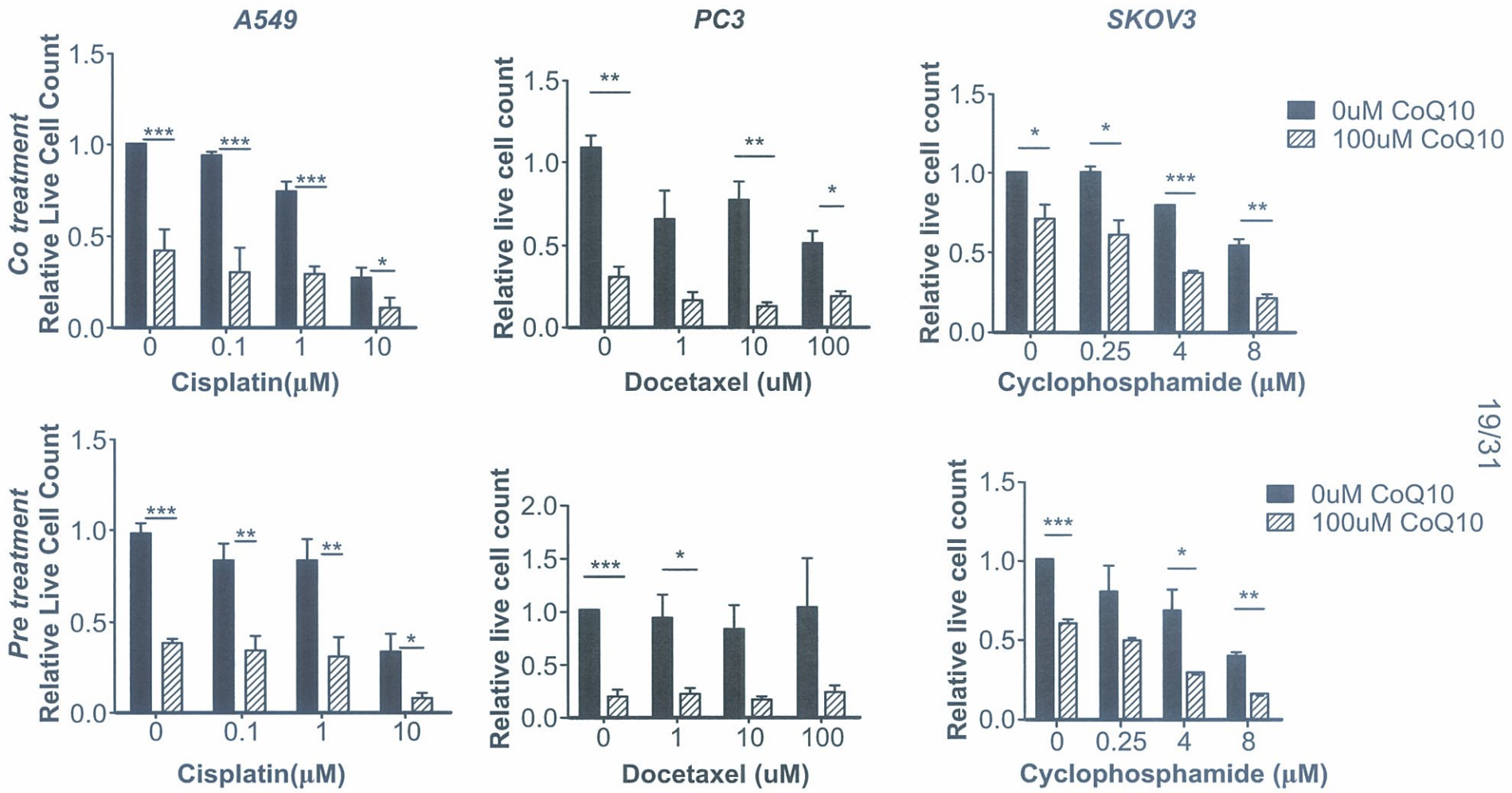

A549
PC3
SKOV3
Co treatment
Relative Live Cell Count
Relative live cell count
0uM CoQ10
100uM CoQ10
Cisplatin(μM)
Docetaxel (uM)
Cyclophosphamide (μM)
Pre treatment
Relative Live Cell Count
Relative live cell count
0uM CoQ10
100uM CoQ10
Cisplatin(μM)
Docetaxel (uM)
Cyclophosphamide (μM)

Figure 19

Figure 20

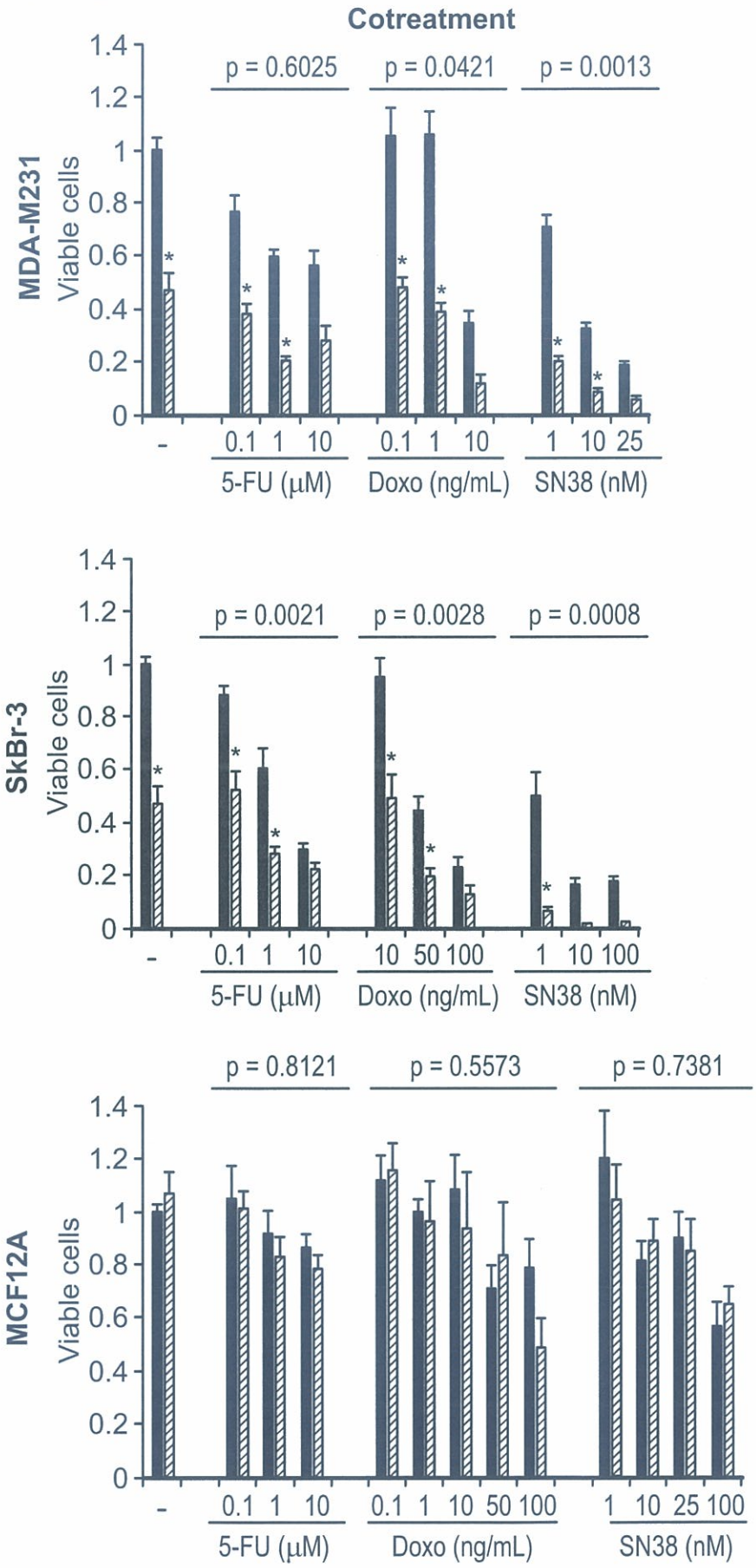
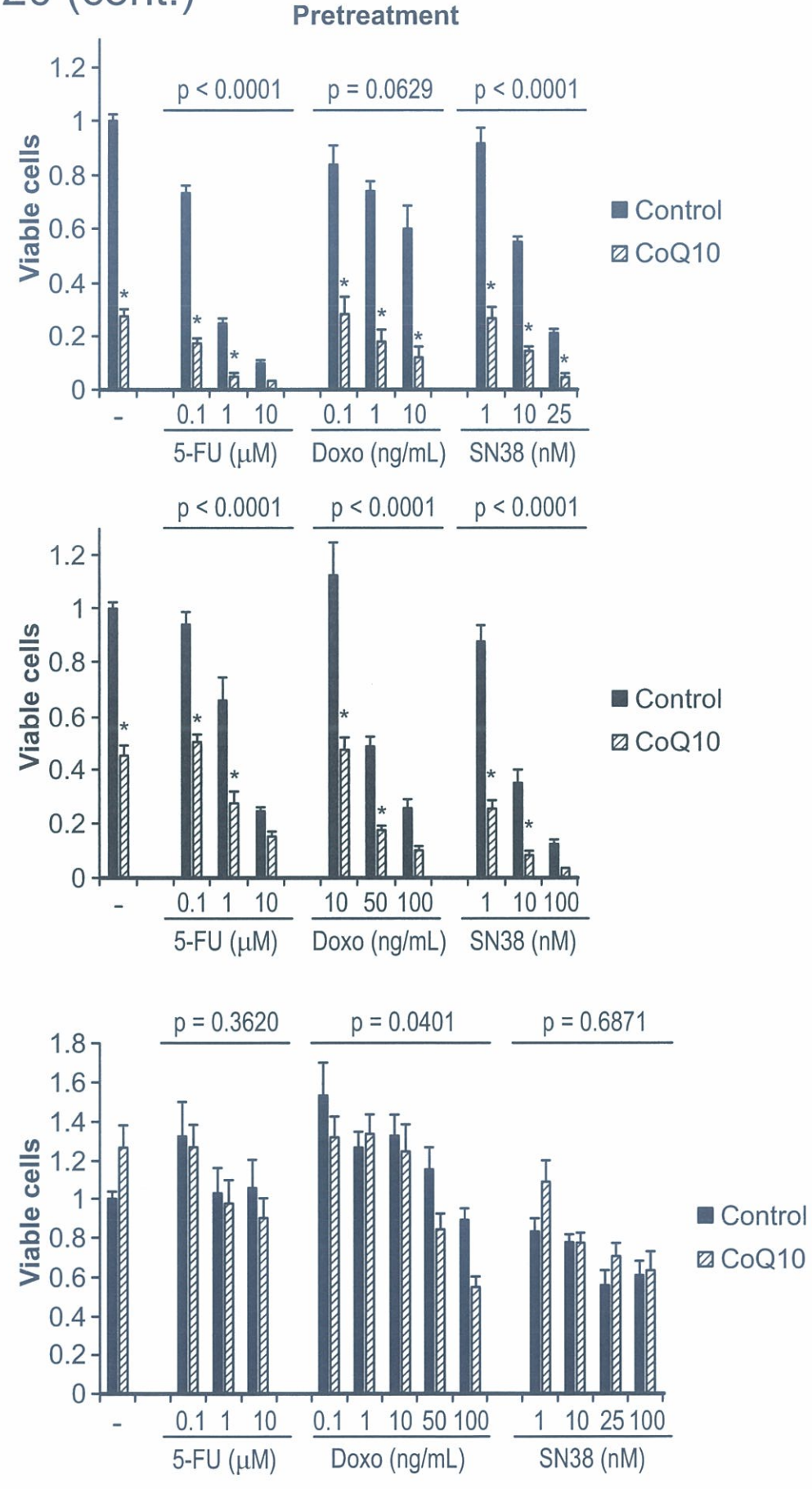

Cotreatment
MDA-M231
Viable cells
p = 0.6025
p = 0.0421
p = 0.0013
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-
0.1 1 10
0.1 1 10
1 10 25
5-FU (μM)
Doxo (ng/mL)
SN38 (nM)
SkBr-3
Viable cells
p = 0.0021
p = 0.0028
p = 0.0008
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-
0.1 1 10
10 50 100
1 10 100
5-FU (μM)
Doxo (ng/mL)
SN38 (nM)
MCF12A
Viable cells
p = 0.8121
p = 0.5573
p = 0.7381
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-
0.1 1 10
0.1 1 10 50 100
1 10 25 100
5-FU (μM)
Doxo (ng/mL)
SN38 (nM)

Figure 20 (cont.)



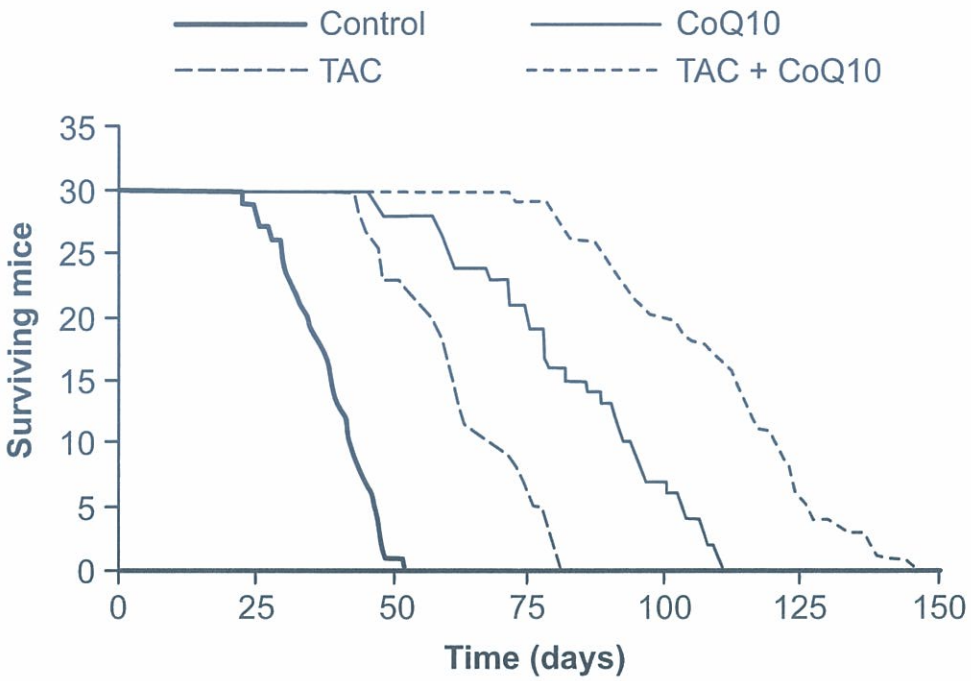


Figure 21

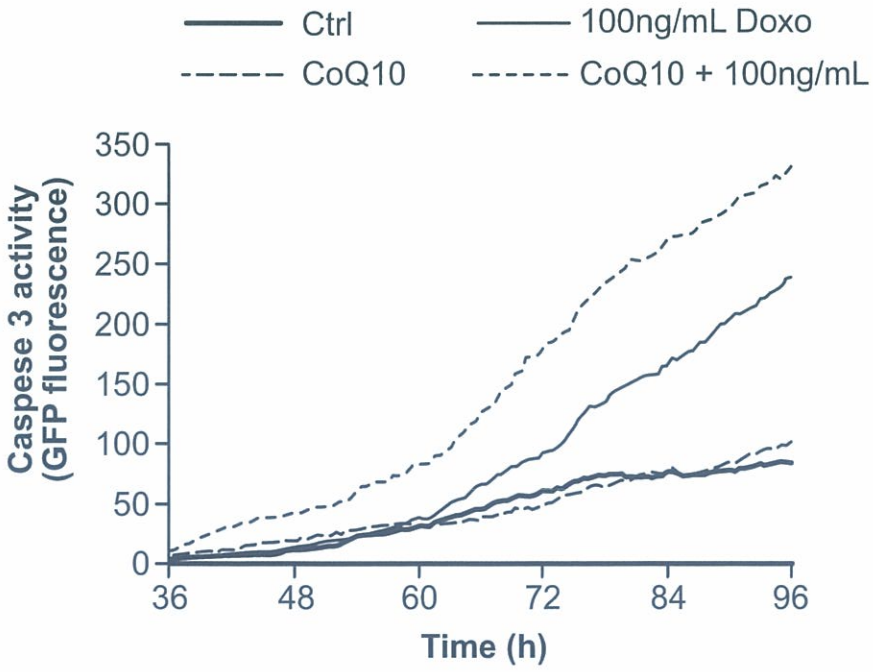
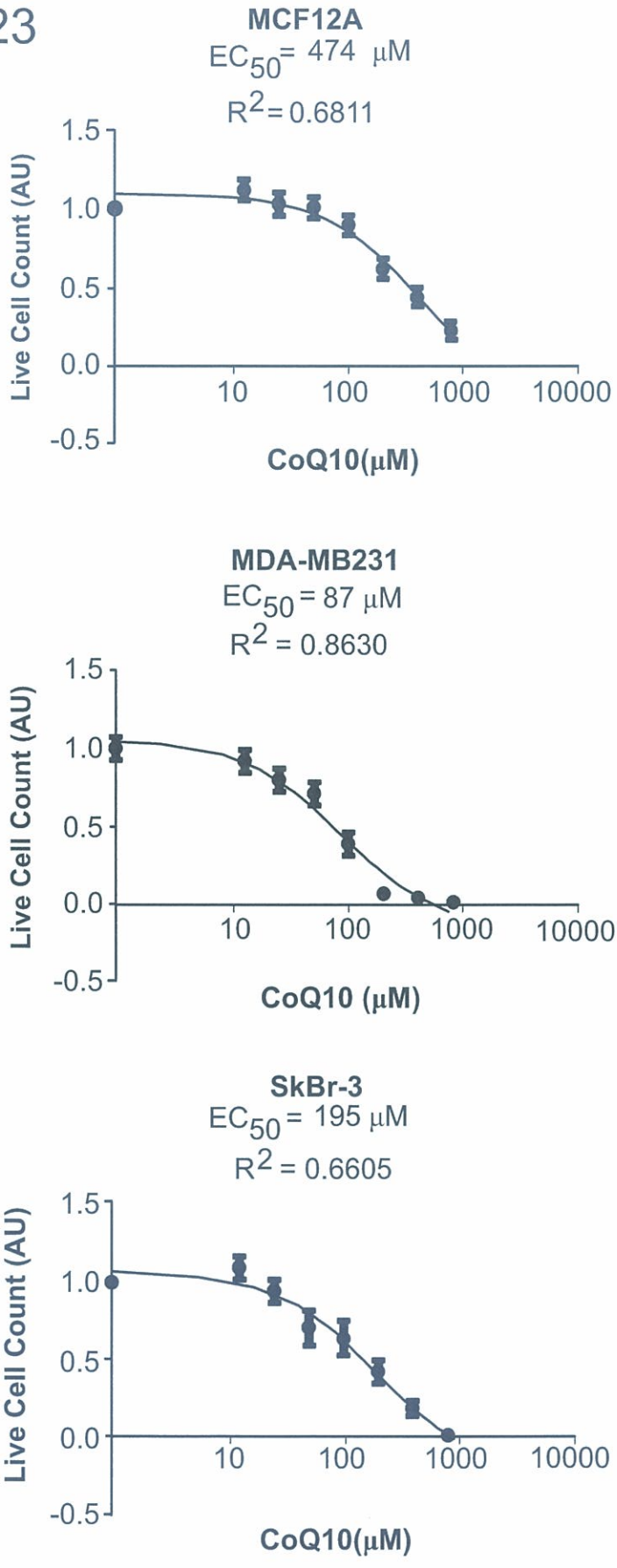


Figure 22

Figure 23


MCF12A
EC50= 474 µM
R2= 0.6811
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10(µM)
MDA-MB231
EC50 = 87 µM
R2 = 0.8630
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10 (µM)
SkBr-3
EC50 = 195 µM
R2 = 0.6605
Live Cell Count (AU)
1.5
1.0
0.5
0.0
-0.5
10
100
1000
10000
CoQ10(µM)

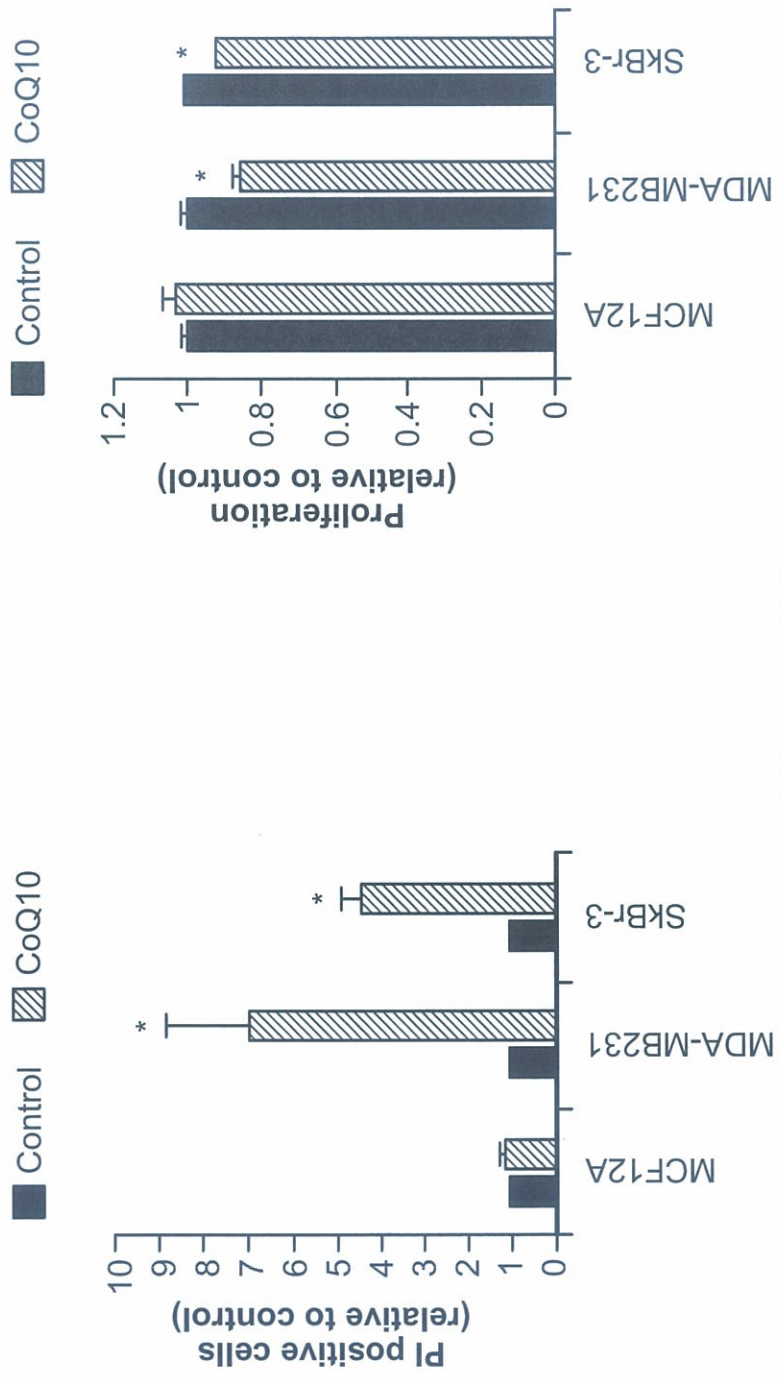
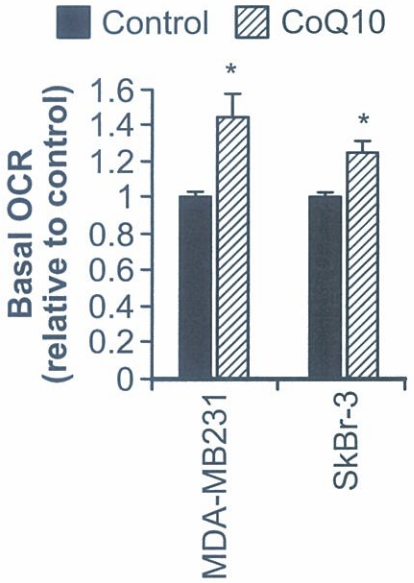
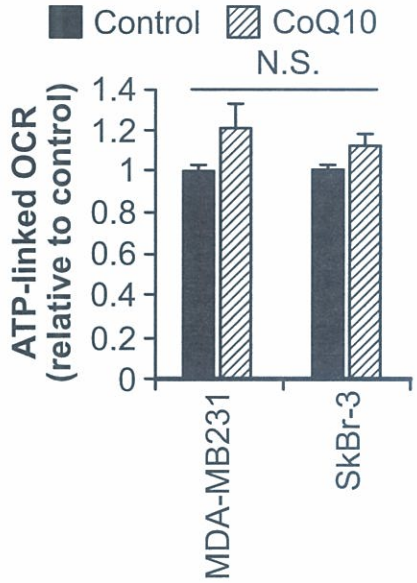
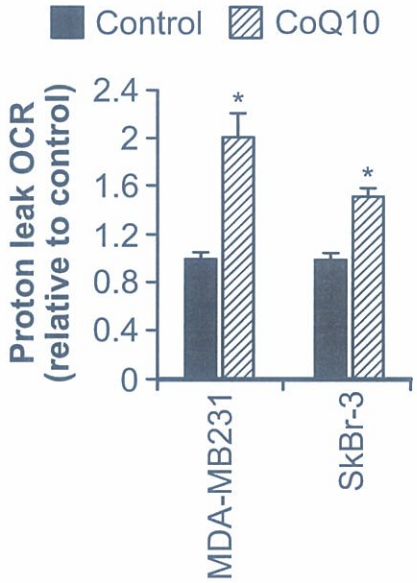

Control
CoQ10
Proliferation
(relative to control)
1.2
1
0.8
0.6
0.4
0.2
0
MCF12A
MDA-MB231
SKBr-3
*
*
*
PI positive cells
(relative to control)
10
9
8
7
6
5
4
3
2
1
0
MCF12A
MDA-MB231
SKBr-3

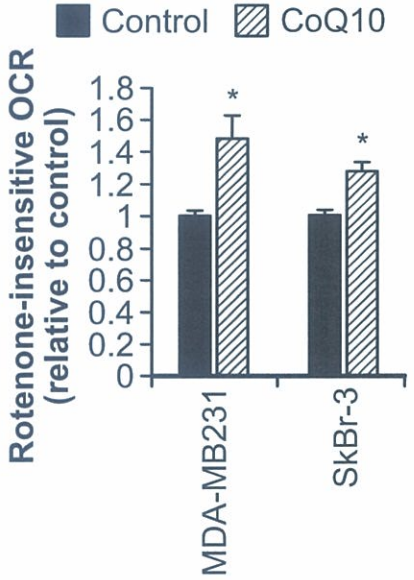
Figure 24

Figure 25


Control
CoQ10
Basal OCR (relative to control)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
*
*
MDA-MB231
SkBr-3


Control
CoQ10
N.S.
ATP-linked OCR (relative to control)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
MDA-MB231
SkBr-3


Control
CoQ10
Proton leak OCR (relative to control)
2.4
2
1.6
1.2
0.8
0.4
0
*
*
MDA-MB231
SkBr-3


Control
CoQ10
Rotenone-insensitive OCR (relative to control)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
*
*
MDA-MB231
SkBr-3

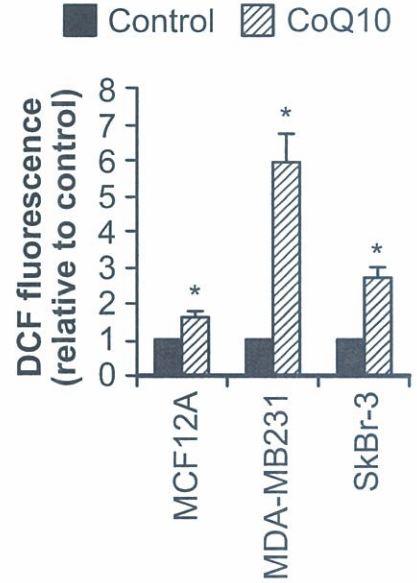
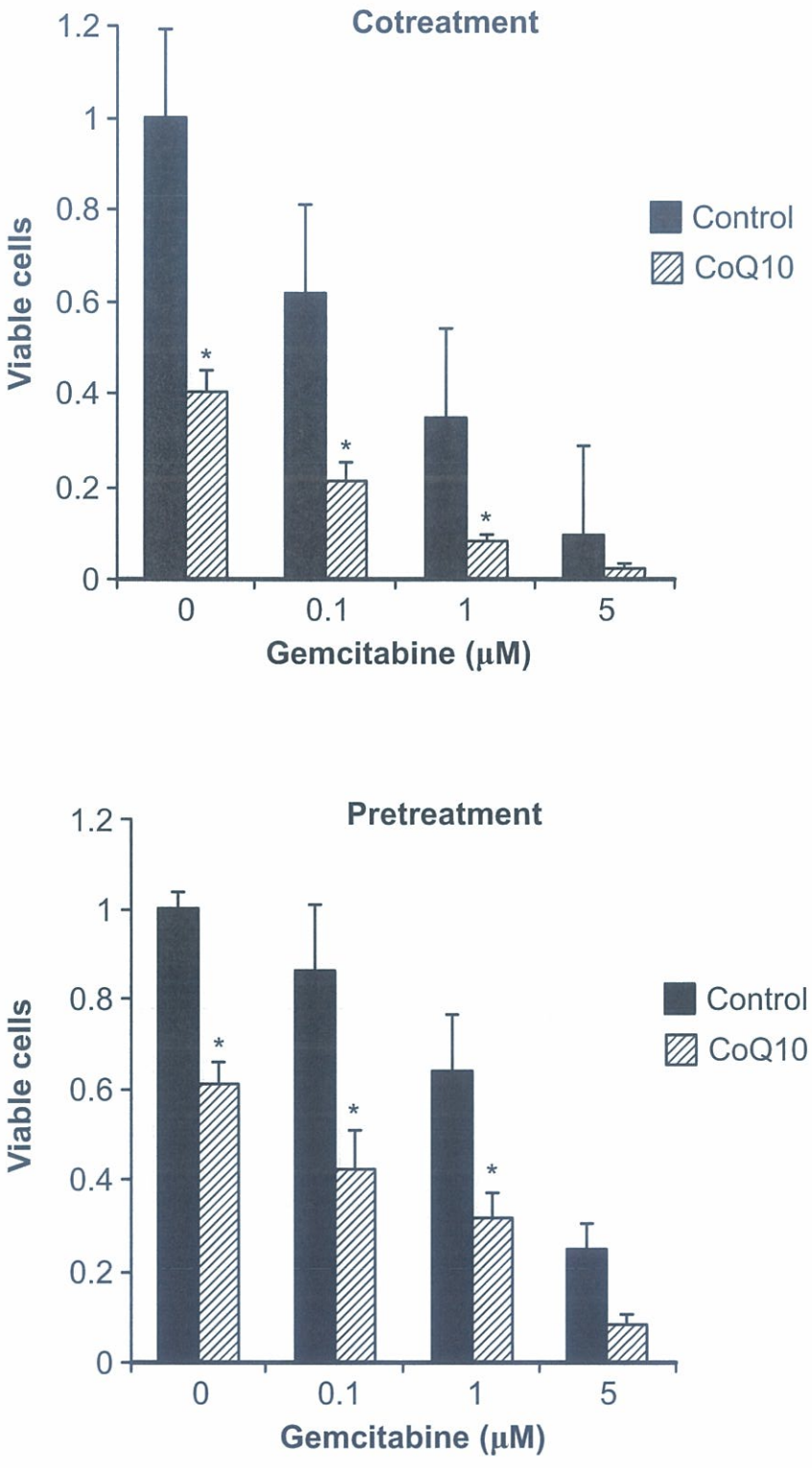

Control
CoQ10
DCF fluorescence (relative to control)
8
7
6
5
4
3
2
1
0
*
*
*
MCF12A
MDA-MB231
SkBr-3

Figure 26


Cotreatment
Viable cells
1.2
1
0.8
0.6
0.4
0.2
0
Control
CoQ10
*
*
*
0
0.1
1
5
Gemcitabine (μM)
Pretreatment
Viable cells
1.2
1
0.8
0.6
0.4
0.2
0
Control
CoQ10
*
*
*
0
0.1
1
5
Gemcitabine (μM)

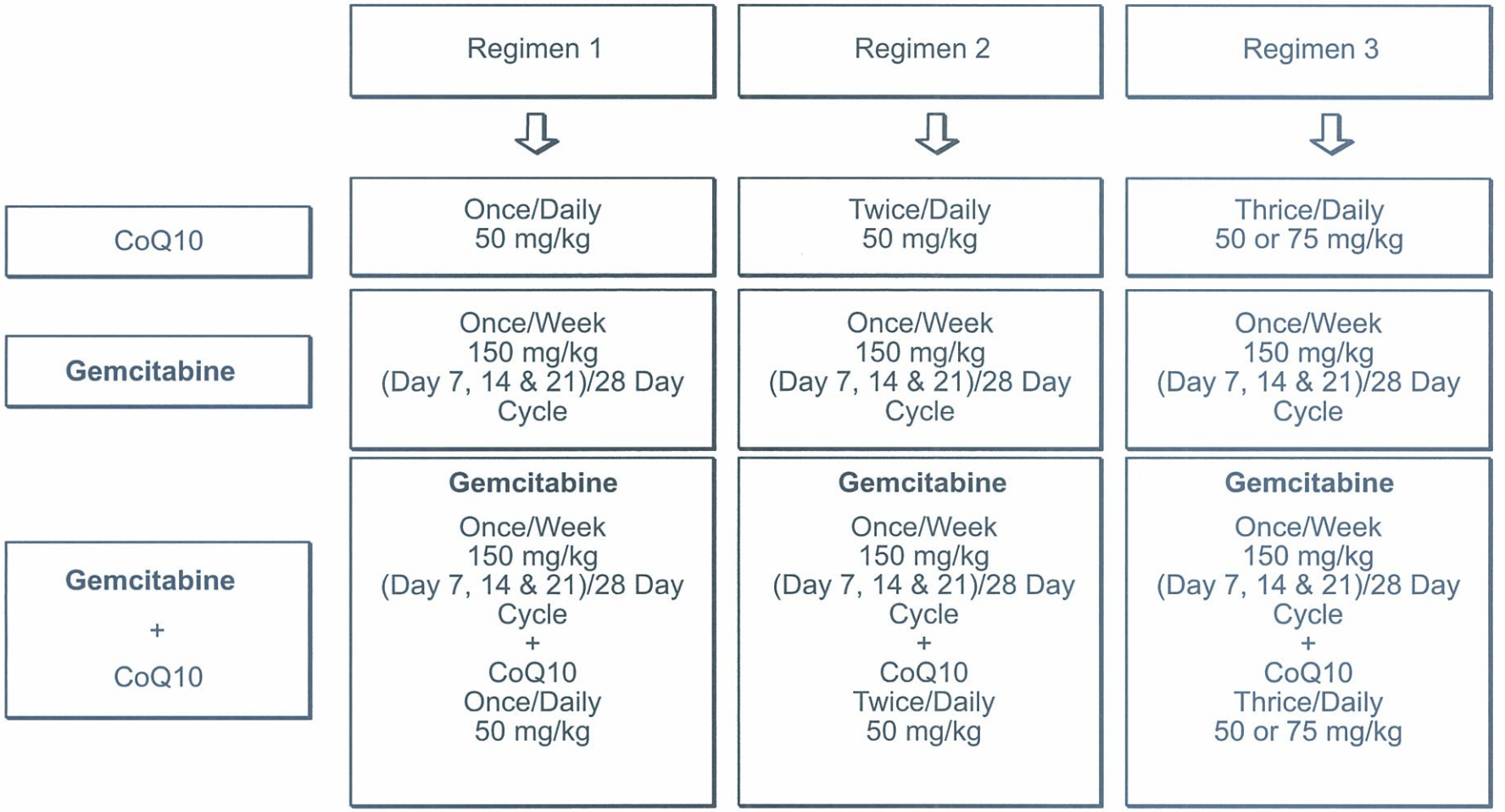

Regimen 1
Regimen 2
Regimen 3
CoQ10
Once/Daily
50 mg/kg
Twice/Daily
50 mg/kg
Thrice/Daily
50 or 75 mg/kg
Gemcitabine
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
Gemcitabine
+
CoQ10
Gemcitabine
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
+
CoQ10
Once/Daily
50 mg/kg
Gemcitabine
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
+
CoQ10
Twice/Daily
50 mg/kg
Gemcitabine
Once/Week
150 mg/kg
(Day 7, 14 & 21)/28 Day
Cycle
+
CoQ10
Thrice/Daily
50 or 75 mg/kg

Figure 27

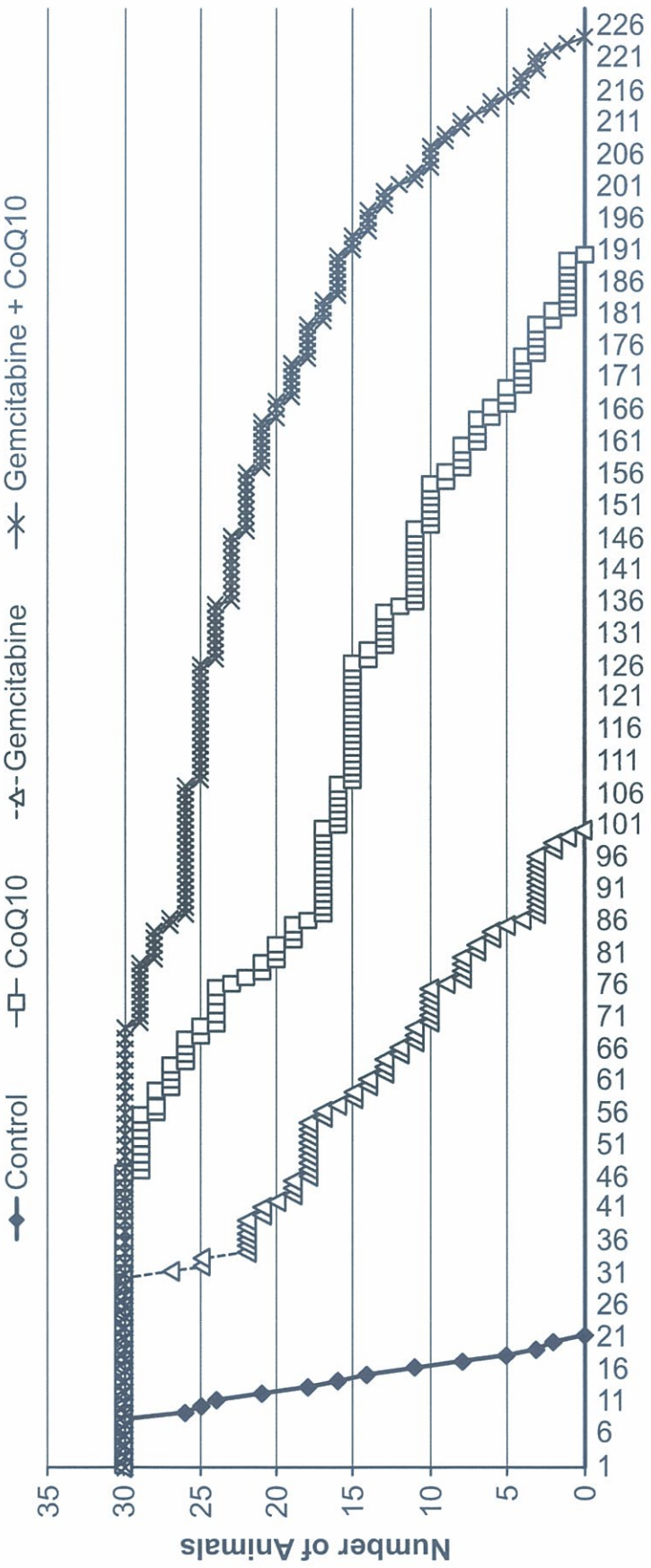

Control
CoQ10
Gemcitabine
Gemcitabine + CoQ10
Number of Animals
35
30
25
20
15
10
5
0
226
221
216
211
206
201
196
191
186
181
176
171
166
161
156
151
146
141
136
131
126
121
116
111
106
101
96
91
86
81
76
71
66
61
56
51
46
41
36
31
26
21
16
11
6
1

Figure 28

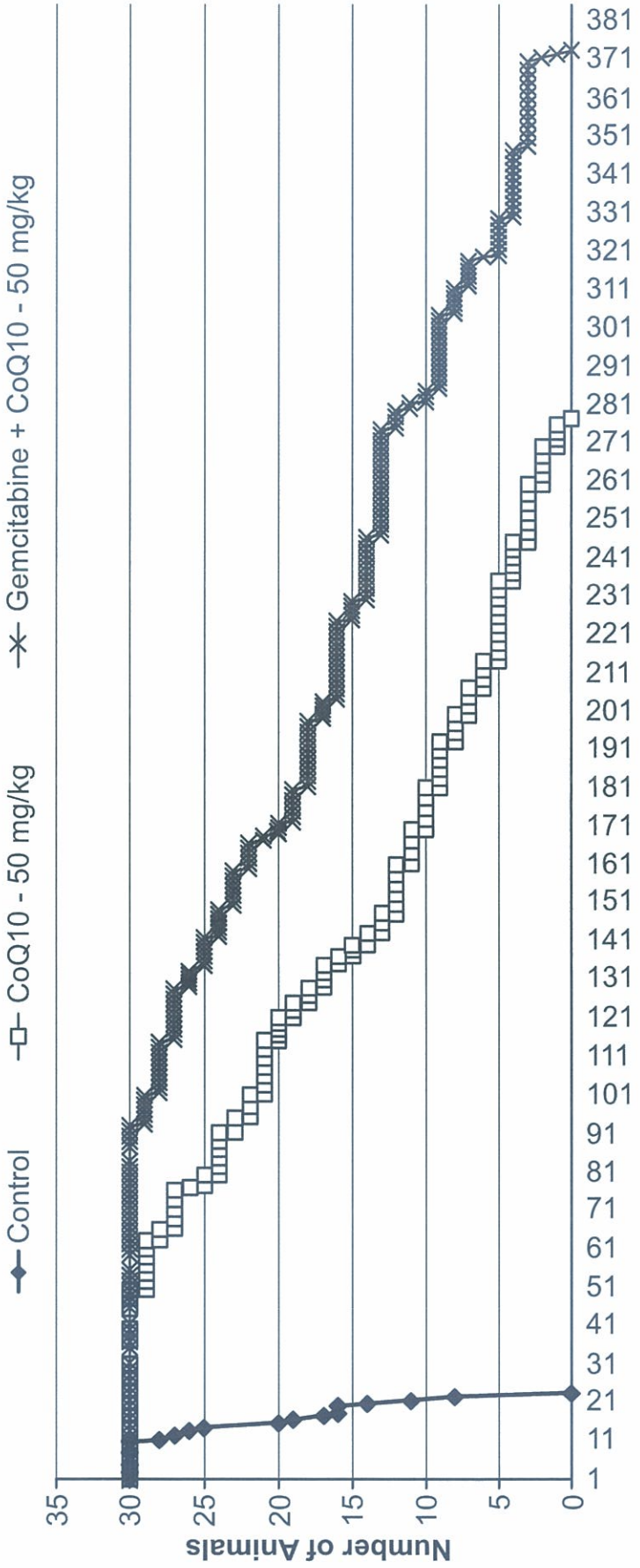

Control
CoQ10 - 50 mg/kg
Gemcitabine + CoQ10 - 50 mg/kg
Number of Animals
0
5
10
15
20
25
30
35
1
11
21
31
41
51
61
71
81
91
101
111
121
131
141
151
161
171
181
191
201
211
221
231
241
251
261
271
281
291
301
311
321
331
341
351
361
371
381

Figure 29

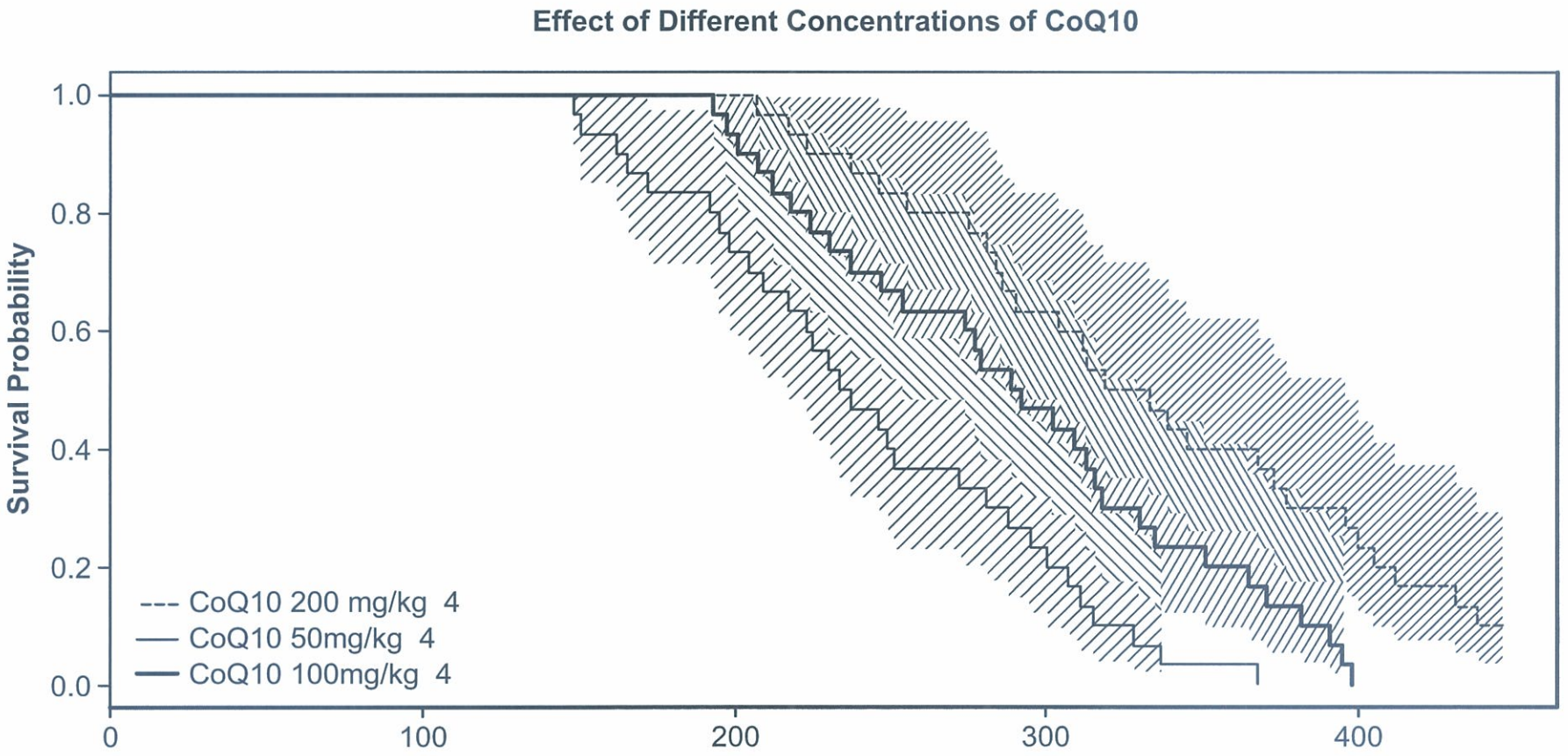

Effect of Different Concentrations of CoQ10
Survival Probability
1.0
0.8
0.6
0.4
0.2
0.0
0
100
200
300
400
--- CoQ10 200 mg/kg 4
— CoQ10 50mg/kg 4
— CoQ10 100mg/kg 4

Figure 30

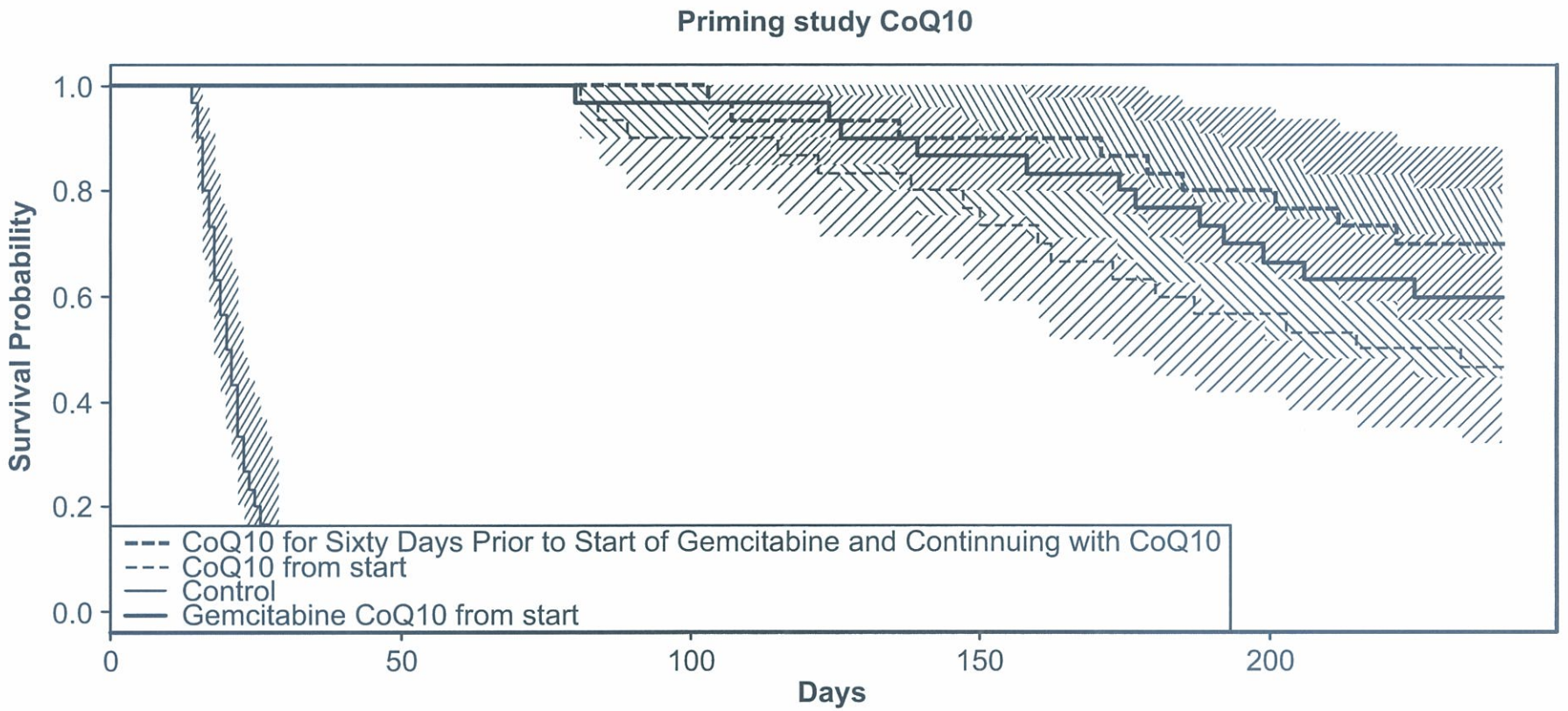

Priming study CoQ10
Survival Probability
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
Days
CoQ10 for Sixty Days Prior to Start of Gemcitabine and Continnuing with CoQ10
CoQ10 from start
Control
Gemcitabine CoQ10 from start

Figure 31