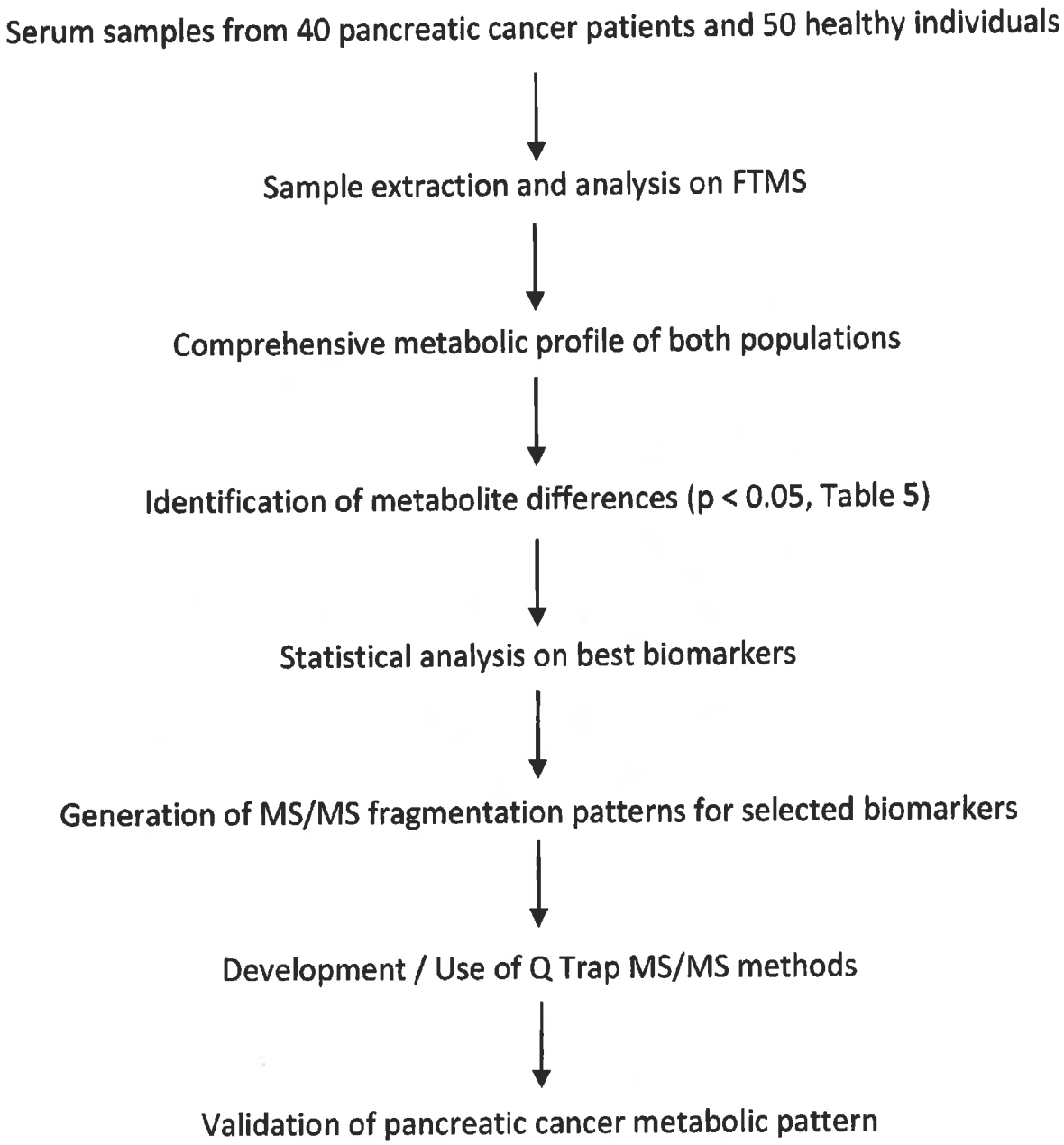

Serum samples from 40 pancreatic cancer patients and 50 healthy individuals
Sample extraction and analysis on FTMS
Comprehensive metabolic profile of both populations
Identification of metabolite differences (p < 0.05, Table 5)
Statistical analysis on best biomarkers
Generation of MS/MS fragmentation patterns for selected biomarkers
Development / Use of Q Trap MS/MS methods
Validation of pancreatic cancer metabolic pattern

**Figure 1**

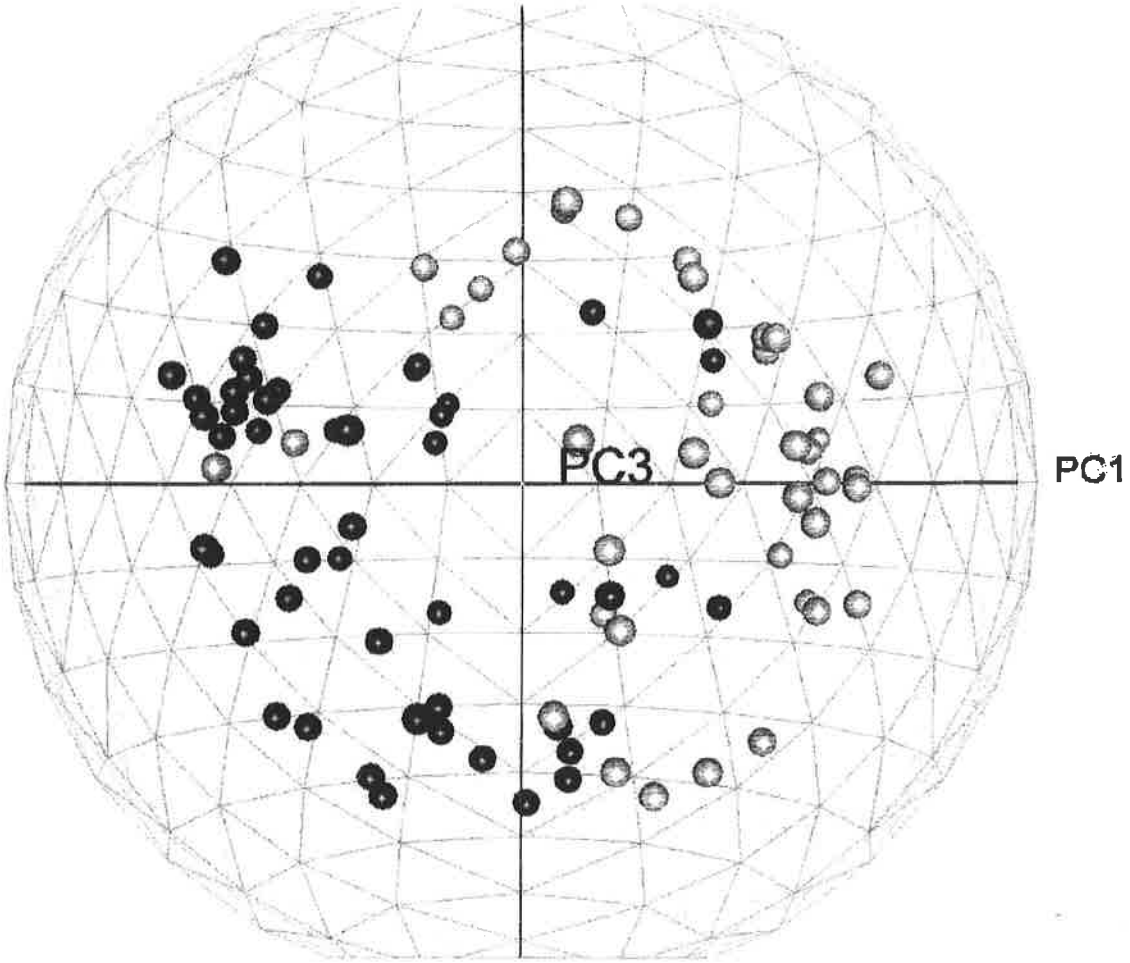



**Figure 2**

**a)**

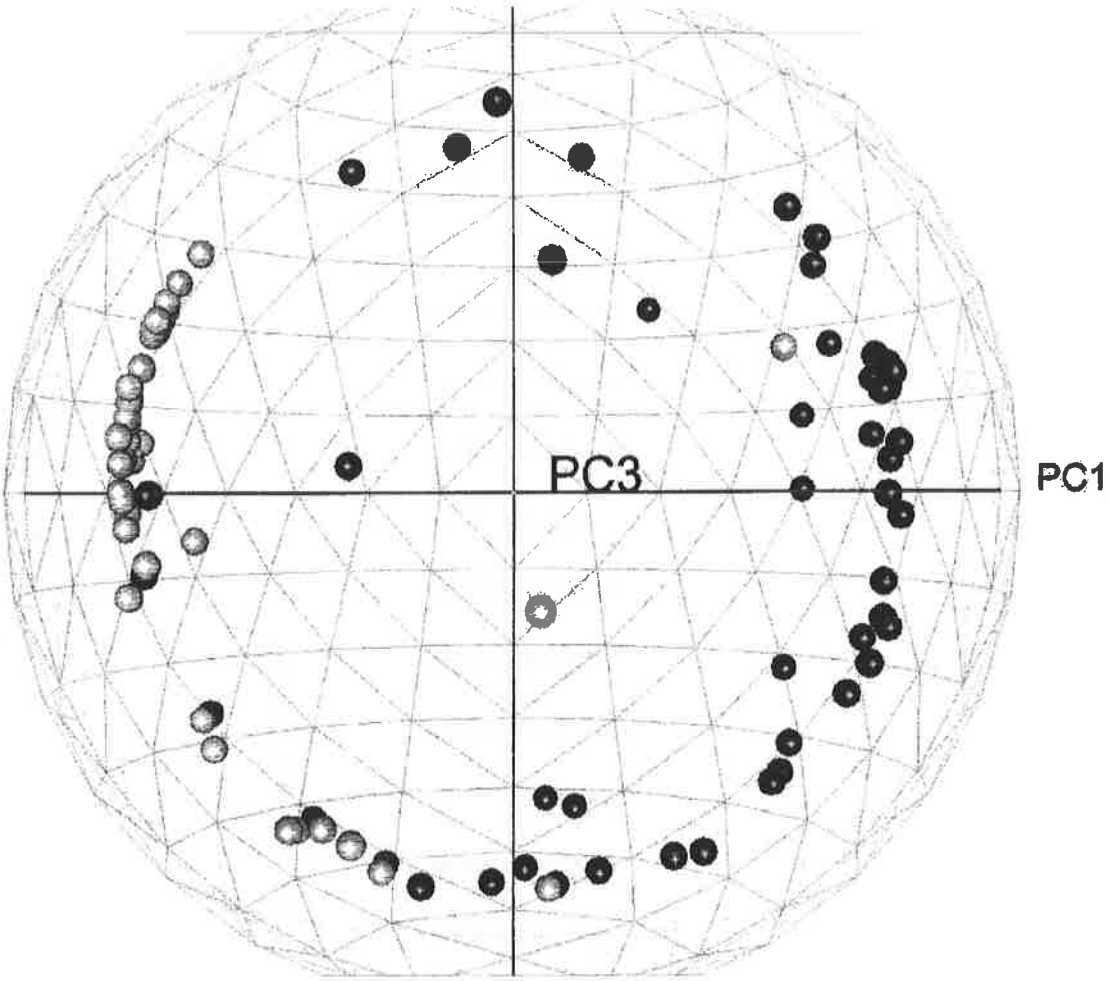
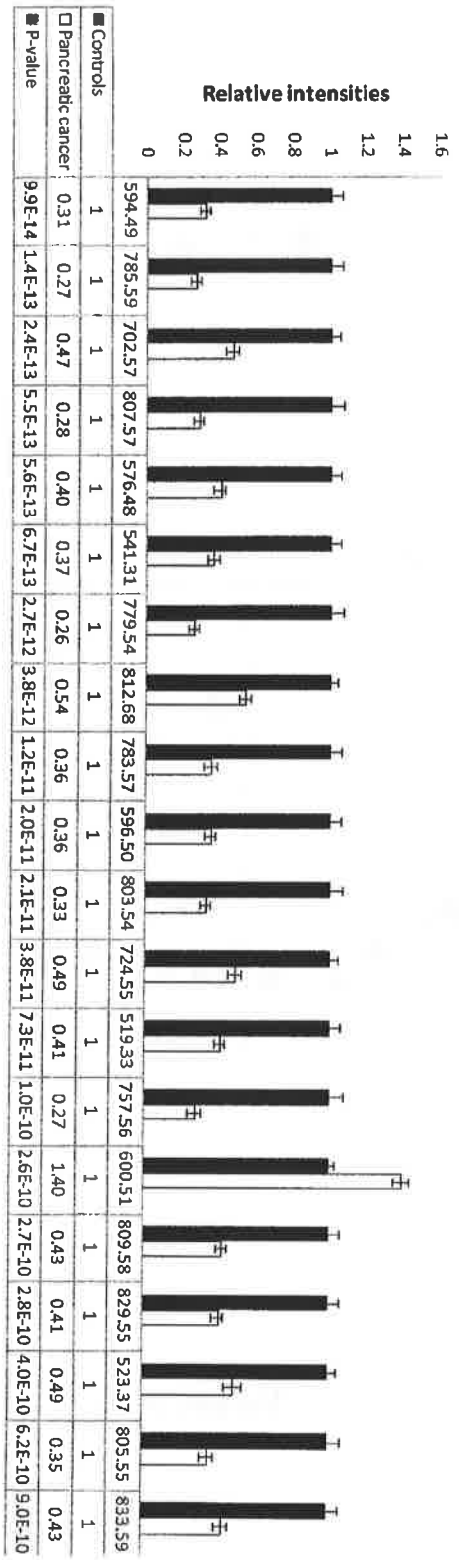



**Figure 3**

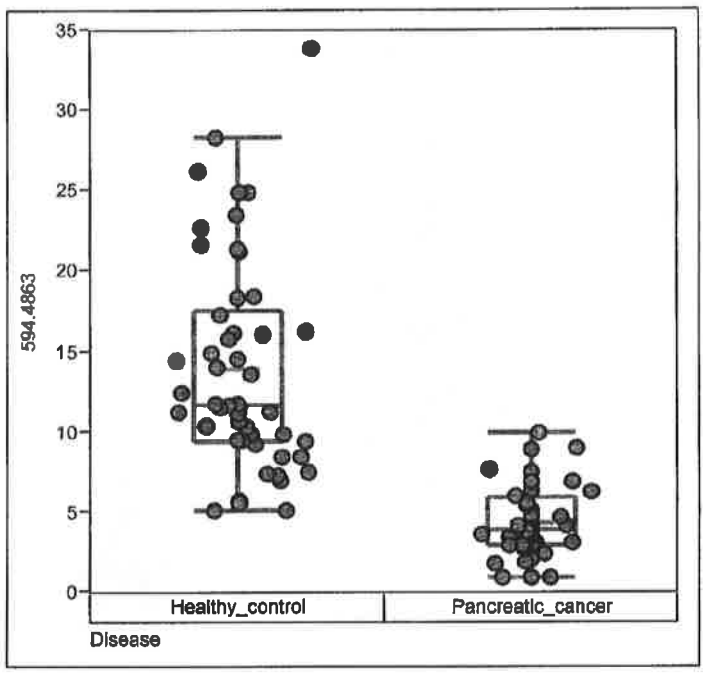
b)




| | 594.49 | 785.59 | 702.57 | 807.57 | 576.48 | 541.31 | 779.54 | 812.68 | 783.57 | 596.50 | 803.54 | 724.55 | 519.33 | 757.56 | 600.51 | 809.58 | 829.55 | 523.37 | 805.55 | 833.59 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| □ Pancreatic cancer | 0.31 | 0.27 | 0.47 | 0.28 | 0.40 | 0.37 | 0.26 | 0.54 | 0.36 | 0.36 | 0.33 | 0.49 | 0.41 | 0.27 | 1.40 | 0.43 | 0.41 | 0.49 | 0.35 | 0.43 |
| ■ P-value | 9.9E-14 | 1.4E-13 | 2.4E-13 | 5.5E-13 | 5.6E-13 | 6.7E-13 | 2.7E-12 | 3.8E-12 | 1.2E-11 | 2.0E-11 | 2.1E-11 | 3.8E-11 | 7.3E-11 | 1.0E-10 | 2.6E-10 | 2.7E-10 | 2.8E-10 | 4.0E-10 | 6.2E-10 | 9.0E-10 |

**Figure 3 (Cont.)**

**(a)**


35
30
25
20
15
10
5
0
594.4863
Healthy_control
Pancreatic_cancer
Disease

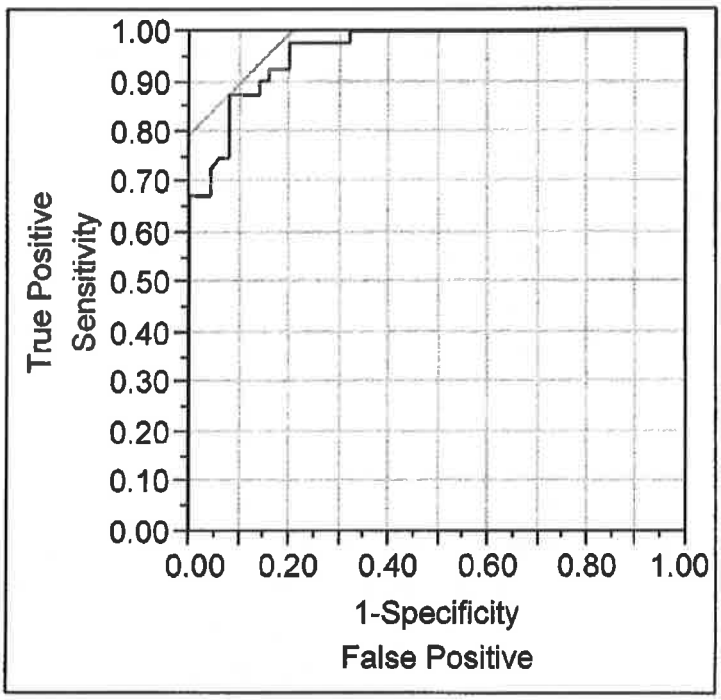
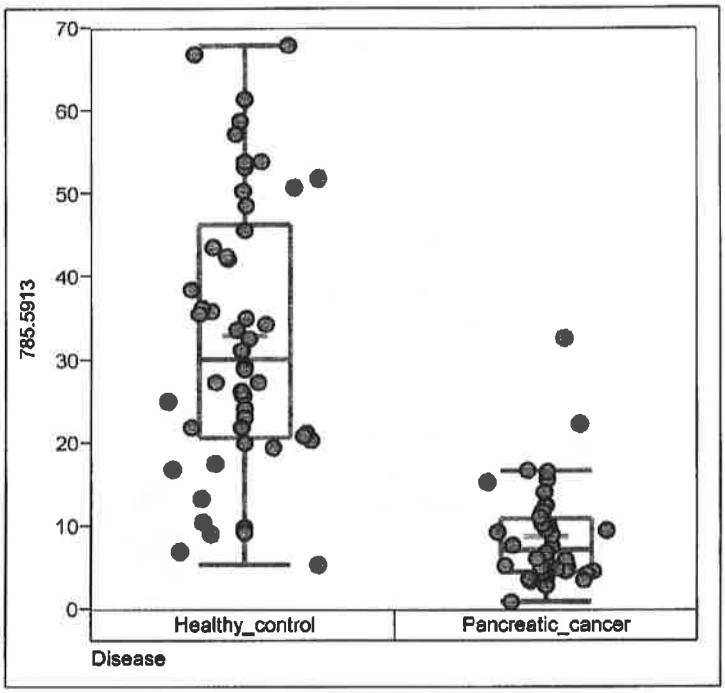

1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
True Positive
Sensitivity
0.00
0.20
0.40
0.60
0.80
1.00
1-Specificity
False Positive

**Figure 4**

**(b)**



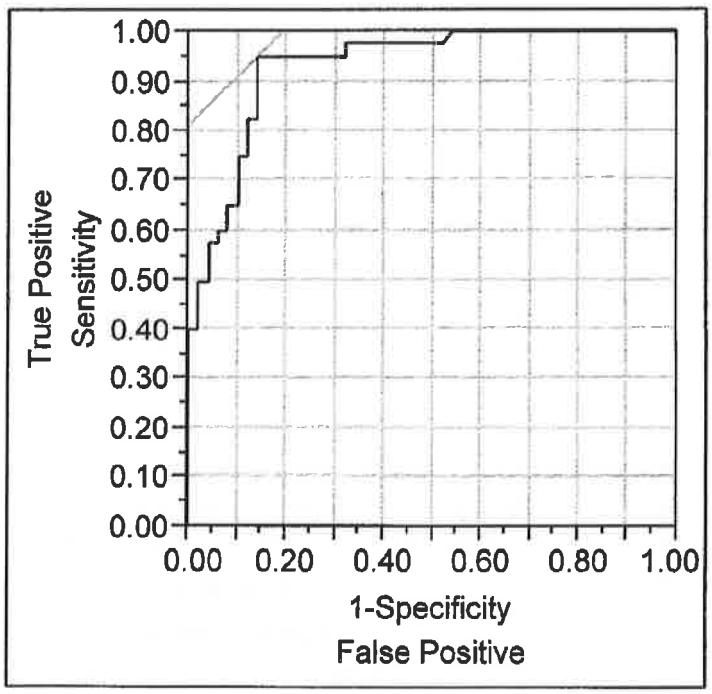
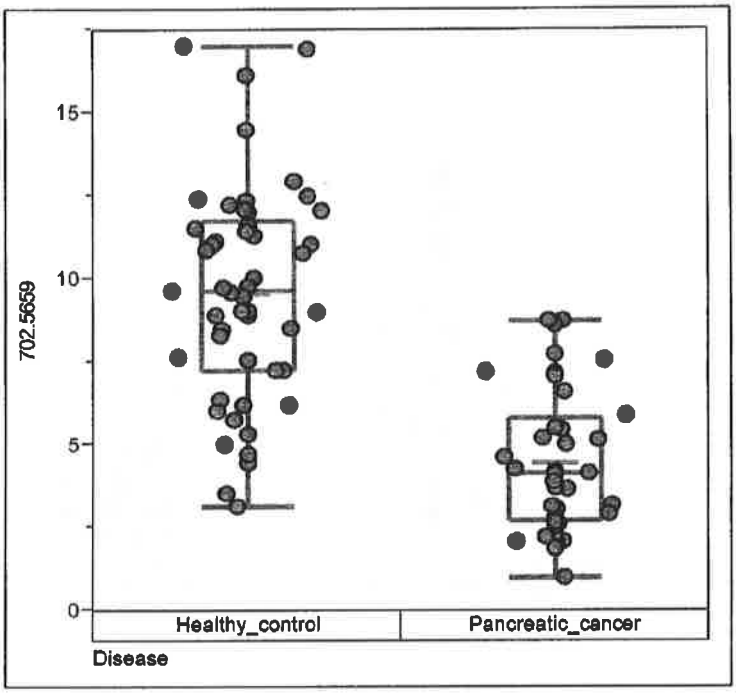




**Figure 4 (cont.)**

**(c)**



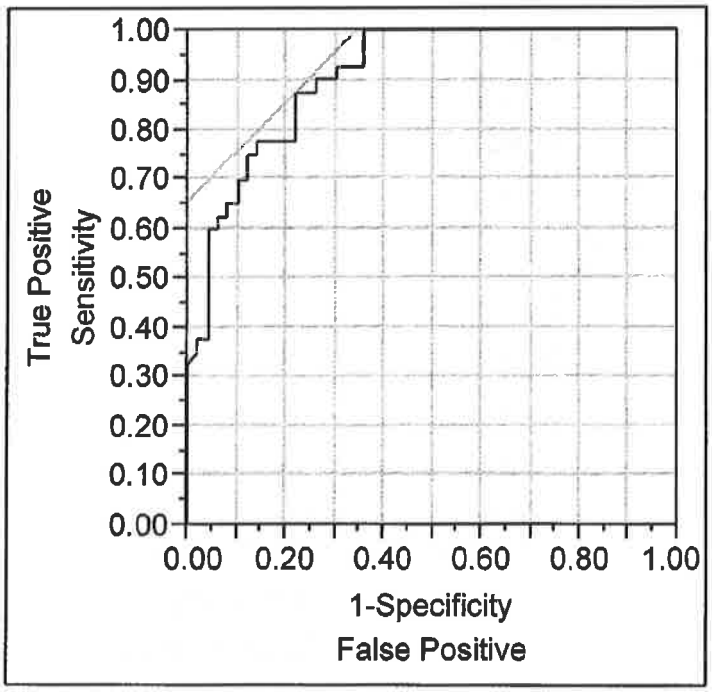
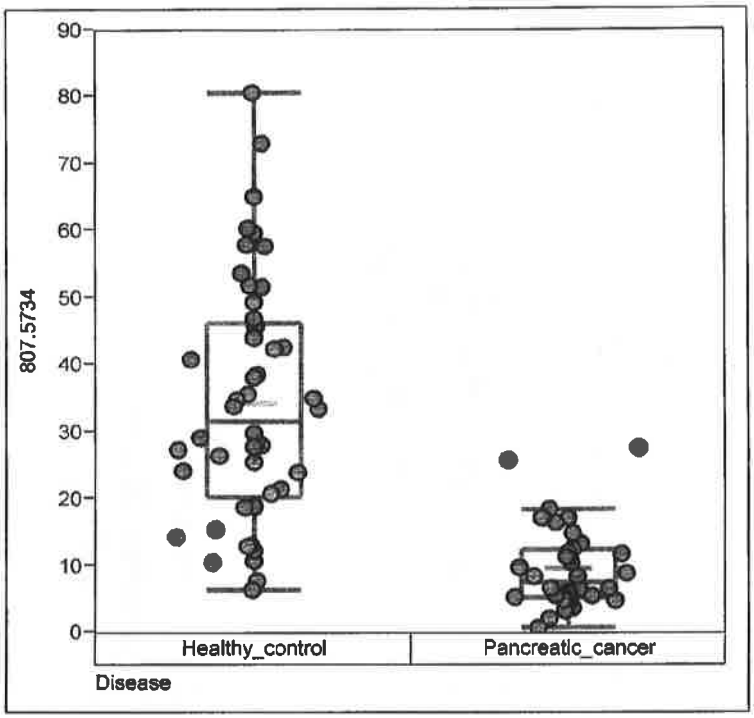




**Figure 4 (cont.)**

**(d)**



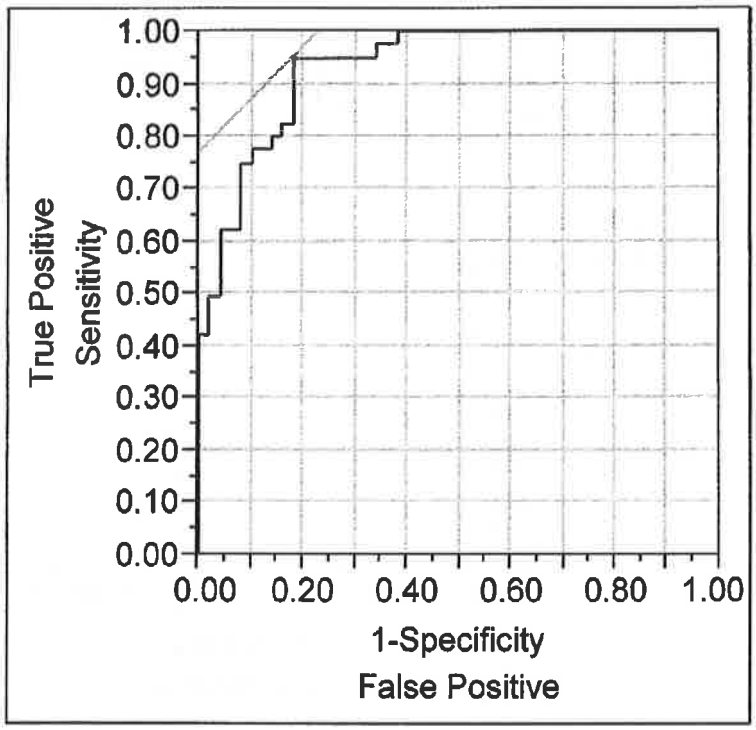
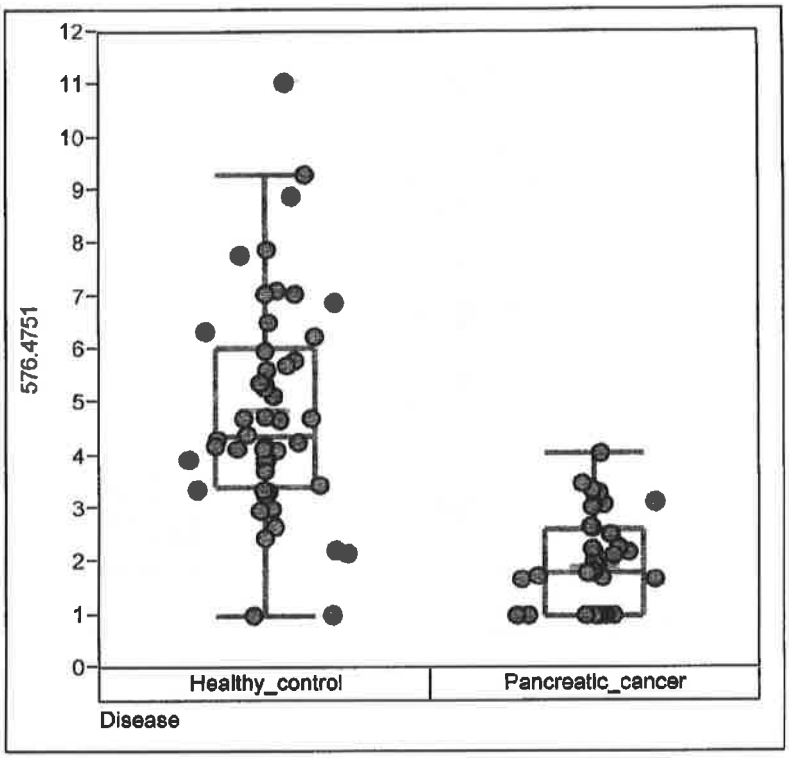




**Figure 4 (cont.)**

**(e)**



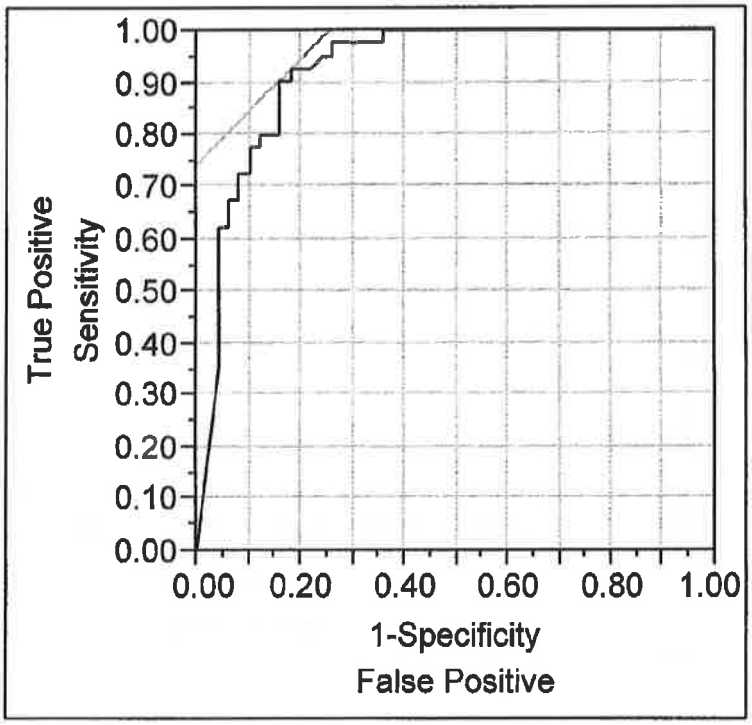
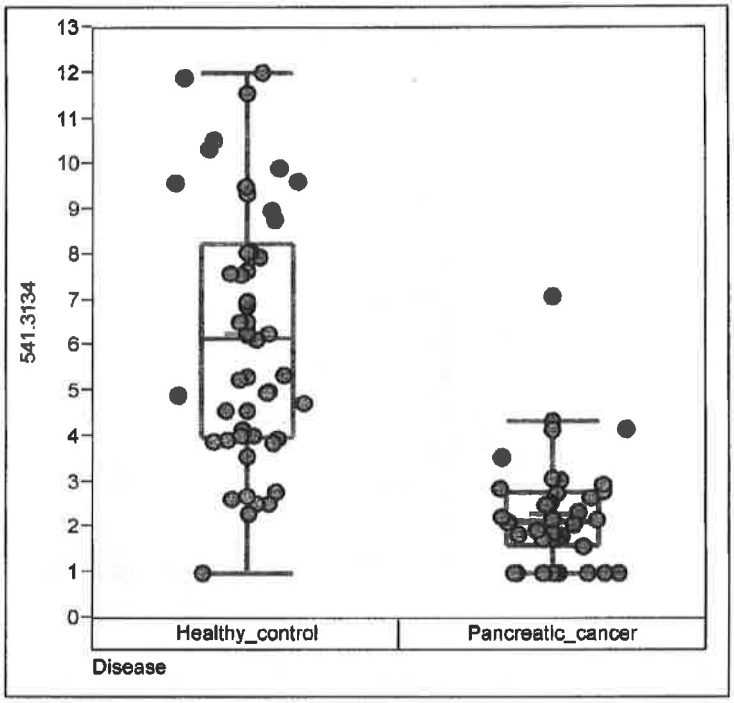




**Figure 4 (cont.)**

**(f)**



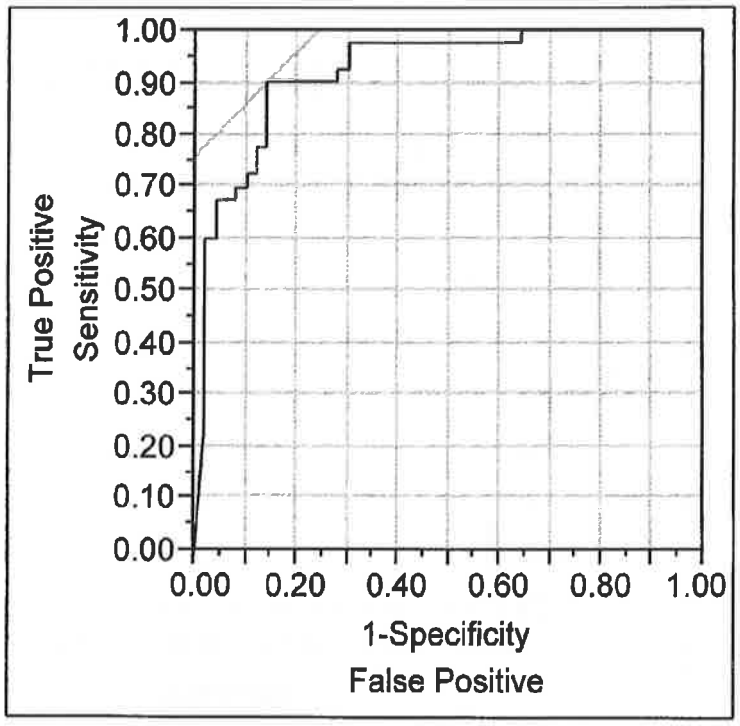
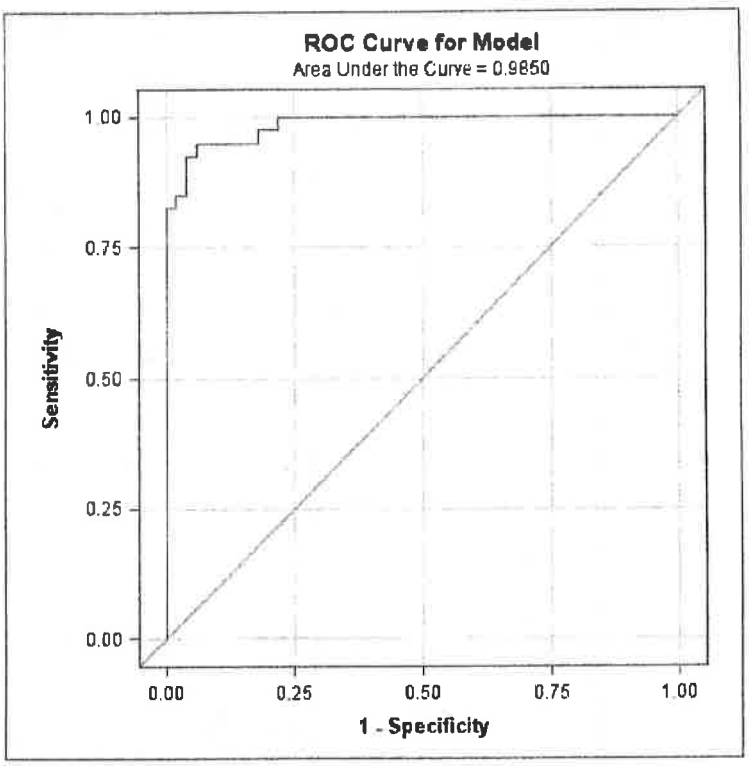




**Figure 4 (cont.)**

**(a)**




**(b)**

Classification Table

| Prob Level | Correct | | Incorrect | | Percentages | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Event | Non-Event | Event | Non-Event | Correct | Sensi-tivity | Speci-ficity | FALSE | FALSE NEG |
| 0.05 | 38 | 36 | 14 | 2 | 82.2 | 95 | 72 | 26.9 | 5.3 |
| 0.1 | 38 | 40 | 10 | 2 | 86.7 | 95 | 80 | 20.8 | 4.8 |
| 0.15 | 38 | 41 | 9 | 2 | 87.8 | 95 | 82 | 19.1 | 4.7 |
| 0.2 | 38 | 42 | 8 | 2 | 88.9 | 95 | 84 | 17.4 | 4.5 |
| 0.25 | 38 | 42 | 8 | 2 | 88.9 | 95 | 84 | 17.4 | 4.5 |
| 0.3 | 38 | 42 | 8 | 2 | 88.9 | 95 | 84 | 17.4 | 4.5 |
| 0.35 | 38 | 42 | 8 | 2 | 88.9 | 95 | 84 | 17.4 | 4.5 |
| 0.4 | 37 | 43 | 7 | 3 | 88.9 | 92.5 | 86 | 15.9 | 6.5 |
| 0.45 | 37 | 43 | 7 | 3 | 88.9 | 92.5 | 86 | 15.9 | 6.5 |
| 0.5 | 37 | 44 | 6 | 3 | 90 | 92.5 | 88 | 14 | 6.4 |
| 0.55 | 36 | 44 | 6 | 4 | 88.9 | 90 | 88 | 14.3 | 8.3 |
| 0.6 | 34 | 45 | 5 | 6 | 87.8 | 85 | 90 | 12.8 | 11.8 |
| 0.65 | 34 | 45 | 5 | 6 | 87.8 | 85 | 90 | 12.8 | 11.8 |
| 0.7 | 33 | 46 | 4 | 7 | 87.8 | 82.5 | 92 | 10.8 | 13.2 |
| 0.75 | 33 | 48 | 2 | 7 | 90 | 82.5 | 96 | 5.7 | 12.7 |
| 0.8 | 33 | 48 | 2 | 7 | 90 | 82.5 | 96 | 5.7 | 12.7 |
| 0.85 | 31 | 48 | 2 | 9 | 87.8 | 77.5 | 96 | 6.1 | 15.8 |
| 0.9 | 28 | 48 | 2 | 12 | 84.4 | 70 | 96 | 6.7 | 20 |
| 0.95 | 25 | 49 | 1 | 15 | 82.2 | 62.5 | 98 | 3.8 | 23.4 |
| 1 | 0 | 50 | 0 | 40 | 55.6 | 0 | 100 | . | 44.4 |

**Figure 5**

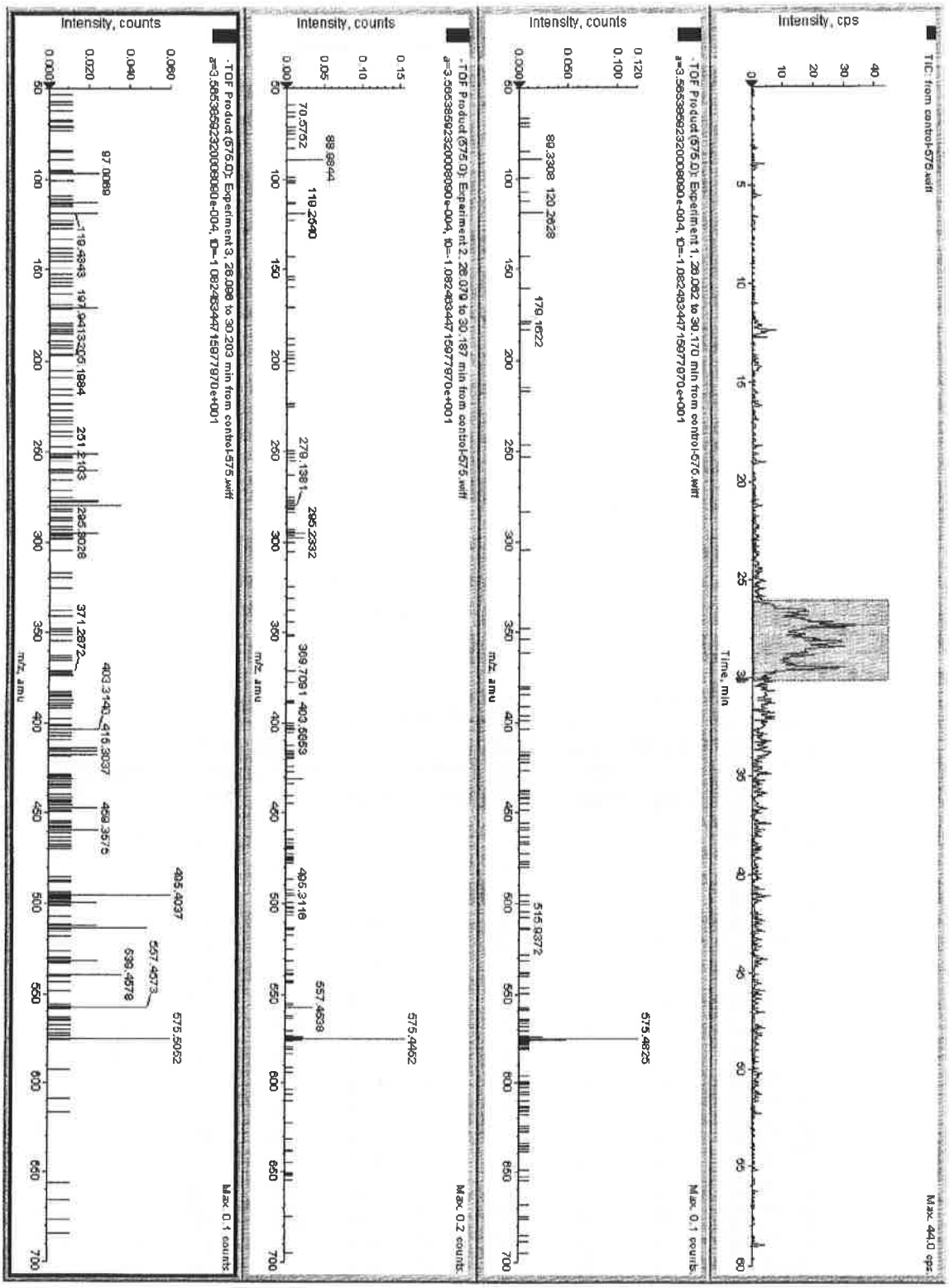

TIC: from control-575.wiff
Intensity, cps
Time, min
Max. 44.0 cps.
- TOF Product (575.0): Experiment 1, 28.062 to 30.170 min from control-575.wiff
a=3.56538592320008060e-004, t0=-1.08249344715977970e+001
Intensity, counts
m/z, amu
Max. 0.1 counts
89.3308
120.2628
179.1622
515.9372
575.4825
- TOF Product (575.0): Experiment 2, 28.079 to 30.187 min from control-575.wiff
a=3.56538592320008060e-004, t0=-1.08249344715977970e+001
Max. 0.2 counts
70.5752
88.9844
119.2540
279.1381
295.2332
369.7091
403.5663
495.3116
557.4528
575.4462
- TOF Product (575.0): Experiment 3, 28.096 to 30.203 min from control-575.wiff
a=3.56538592320008060e-004, t0=-1.08249344715977970e+001
Max. 0.1 counts
97.0069
119.4843
191.9413
205.1894
251.1103
295.3028
371.2872
403.3140
415.3037
459.3575
495.4037
557.4573
639.4579
575.5052

**Figure 6**

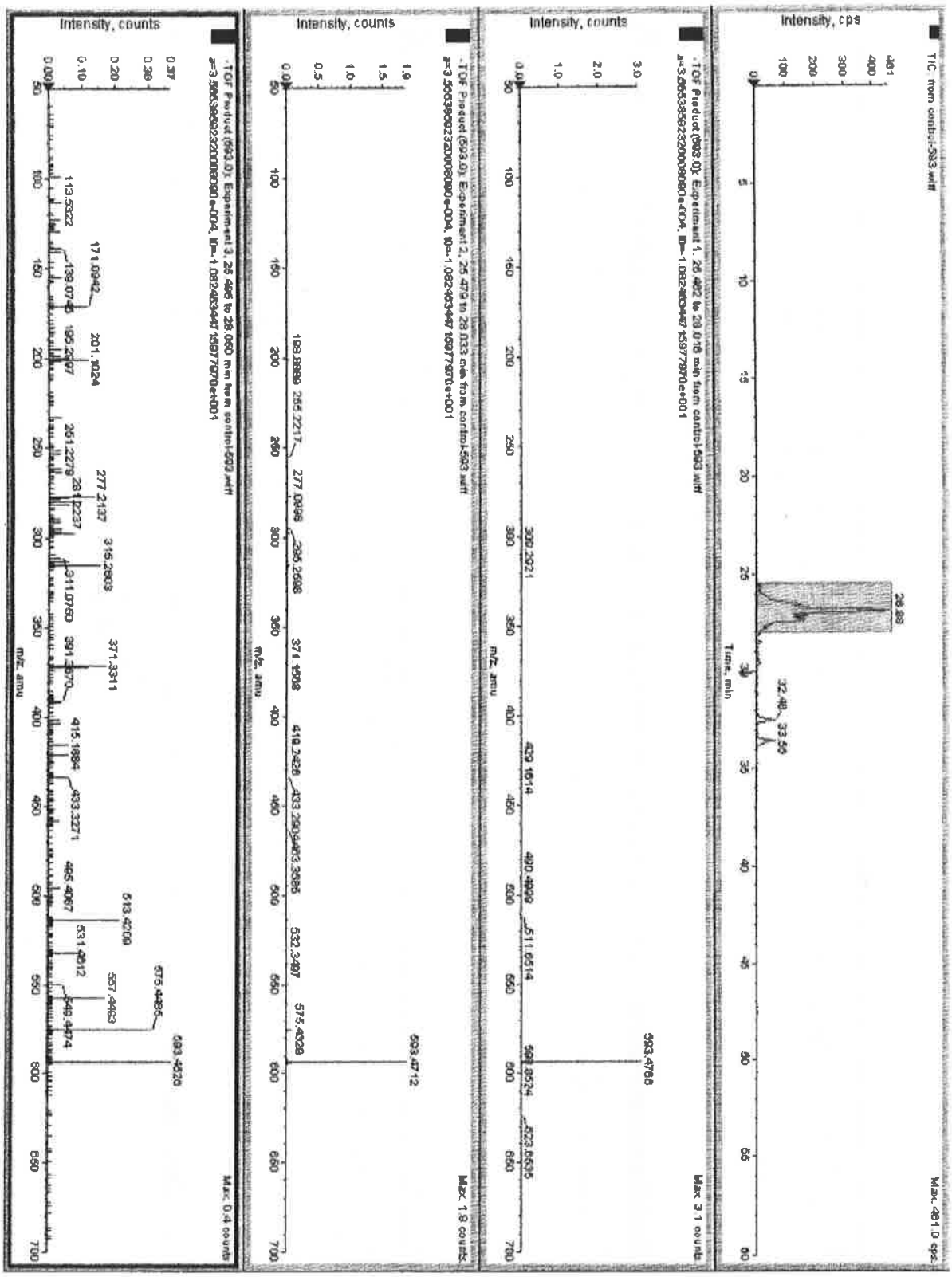

TIC from control-593.wiff
Intensity, cps
Time, min
Max. 481.0 cps.
28.88
32.49
33.59
Intensity, counts
m/z, amu
Max. 3.1 counts.
300.2021
429.1614
490.4999
511.0514
593.4768
523.8535
Max. 1.9 counts.
193.8889
255.2217
277.0998
295.2698
371.1008
410.2426
433.2905
483.3985
532.3497
575.4328
593.4712
Max. 0.4 counts.
171.0942
201.1024
277.2137
315.2603
371.3311
513.4200
575.4485
593.4628

**Figure 7**

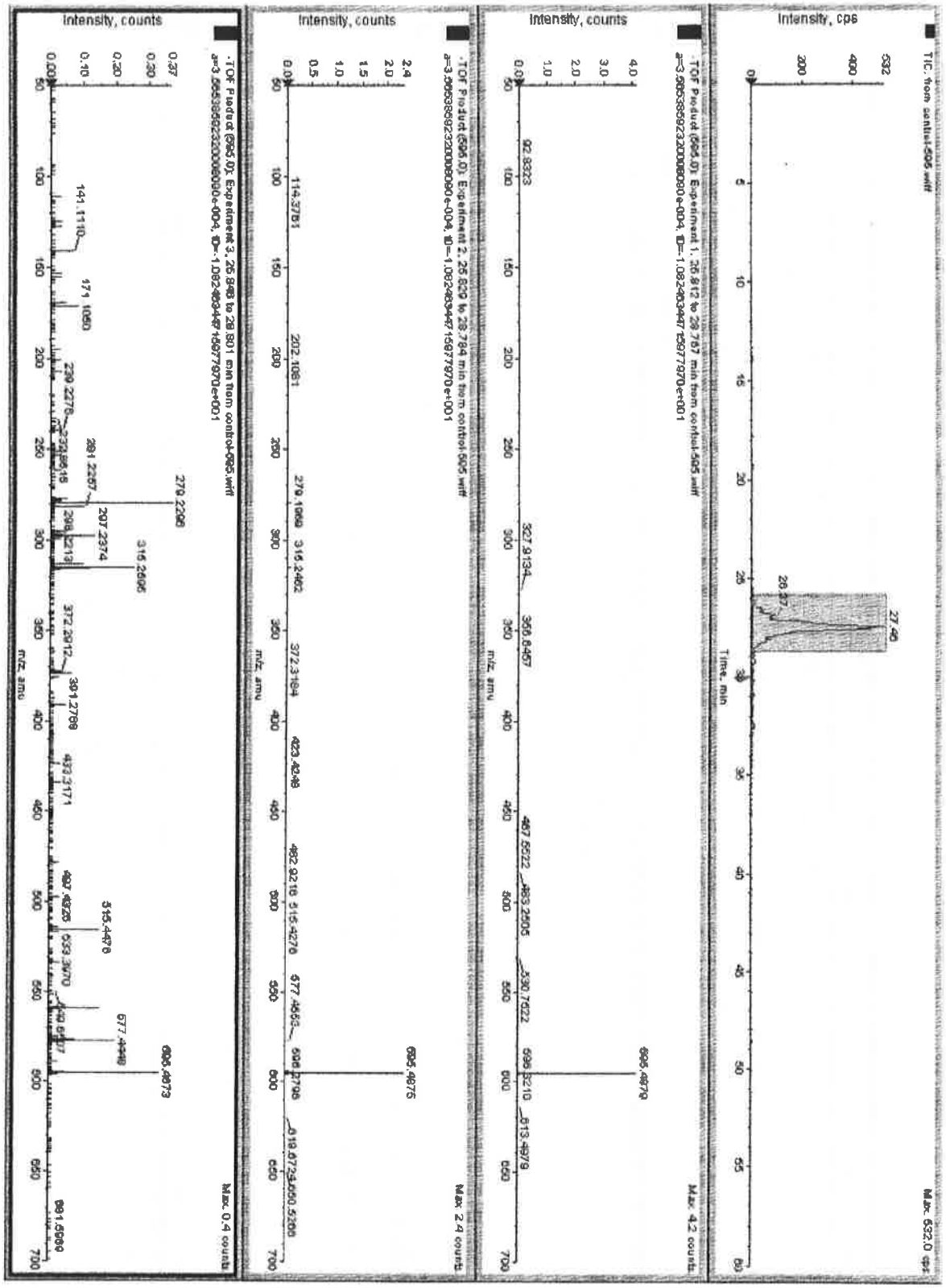

TIC: from sentiel-505.wiff
Intensity, cps
Time, min
27.49
28.37
Max. 532.0 cps
-TOF Product (595.0): Experiment 1, 25.812 to 28.767 min from control-505.wiff
Intensity, counts
m/z, amu
92.8323
327.9134
366.8457
467.5522
483.2505
530.7022
595.4979
613.4979
Max. 4.2 counts
-TOF Product (595.0): Experiment 2, 25.629 to 28.784 min from control-505.wiff
114.3761
202.1061
279.1969
315.2462
372.3184
423.4248
482.9218
515.4276
577.4553
595.4975
619.6723
650.5266
Max. 2.4 counts
-TOF Product (595.0): Experiment 3, 25.948 to 28.801 min from control-505.wiff
141.1110
171.1050
230.2276
261.2267
279.2296
207.2374
315.2695
372.2912
391.2788
433.3171
515.4476
553.3970
595.4973
677.4349
Max. 0.4 counts

**Figure 8**

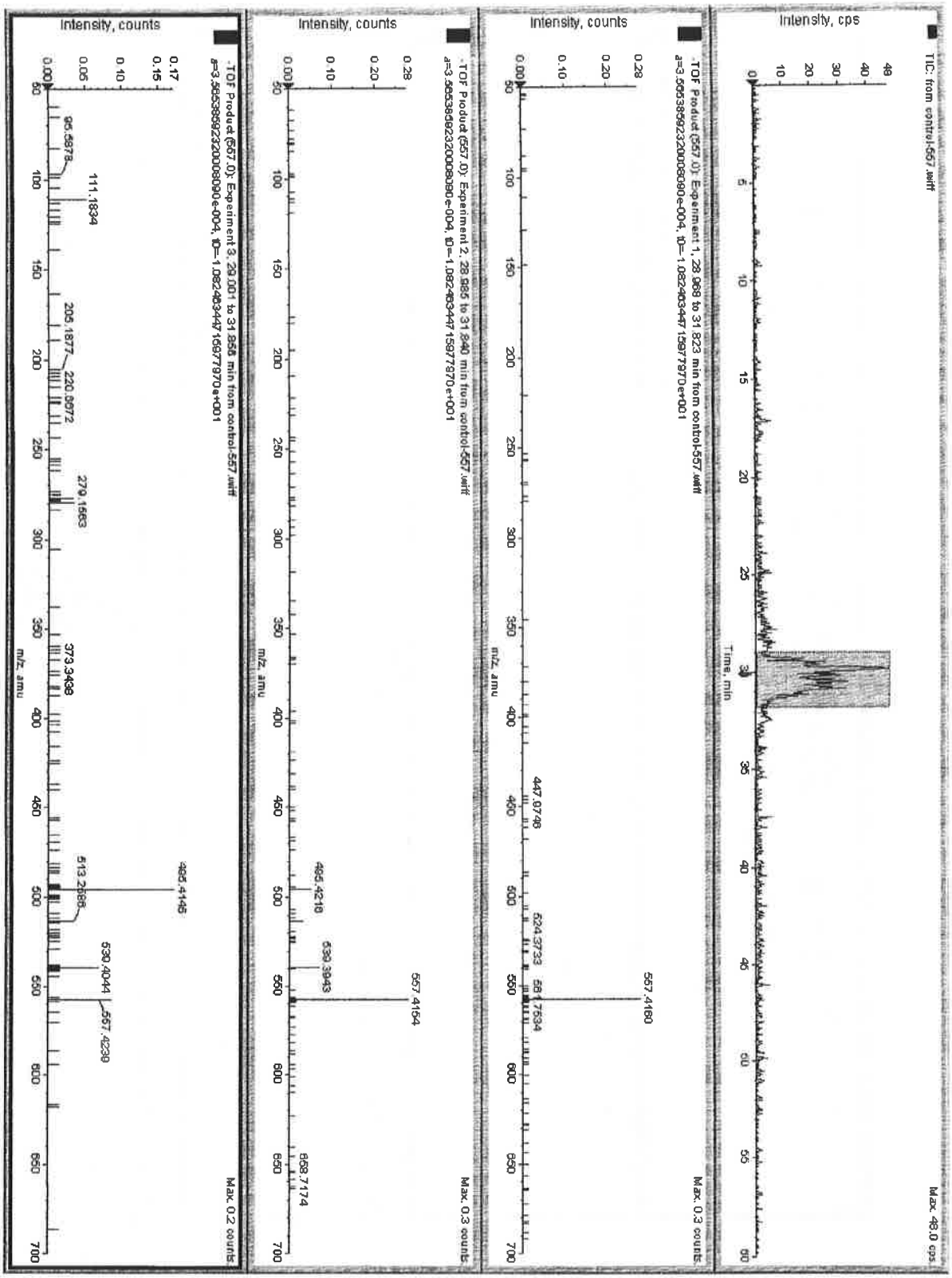

TIC: from control-557.wiff
Intensity, cps
Time, min
Max. 48.0 cps
-TOF Product (557.0): Experiment 1, 28.968 to 31.823 min from control-557.wiff
a=3.56538592320008090e-004, to=-1.08248034471597797970e+001
Intensity, counts
m/z, amu
Max. 0.3 counts
447.0746
524.3733
581.7534
557.4160
-TOF Product (557.0): Experiment 2, 28.885 to 31.840 min from control-557.wiff
a=3.56538592320008090e-004, to=-1.08248034471597797970e+001
Intensity, counts
m/z, amu
Max. 0.3 counts
495.4218
530.3943
557.4154
568.7174
-TOF Product (557.0): Experiment 3, 29.001 to 31.858 min from control-557.wiff
a=3.56538592320008090e-004, to=-1.08248034471597797970e+001
Intensity, counts
m/z, amu
Max. 0.2 counts
95.5878
111.1834
205.1877
220.9572
279.1563
373.3438
485.4145
513.2566
530.4041
557.4239

**Figure 9**

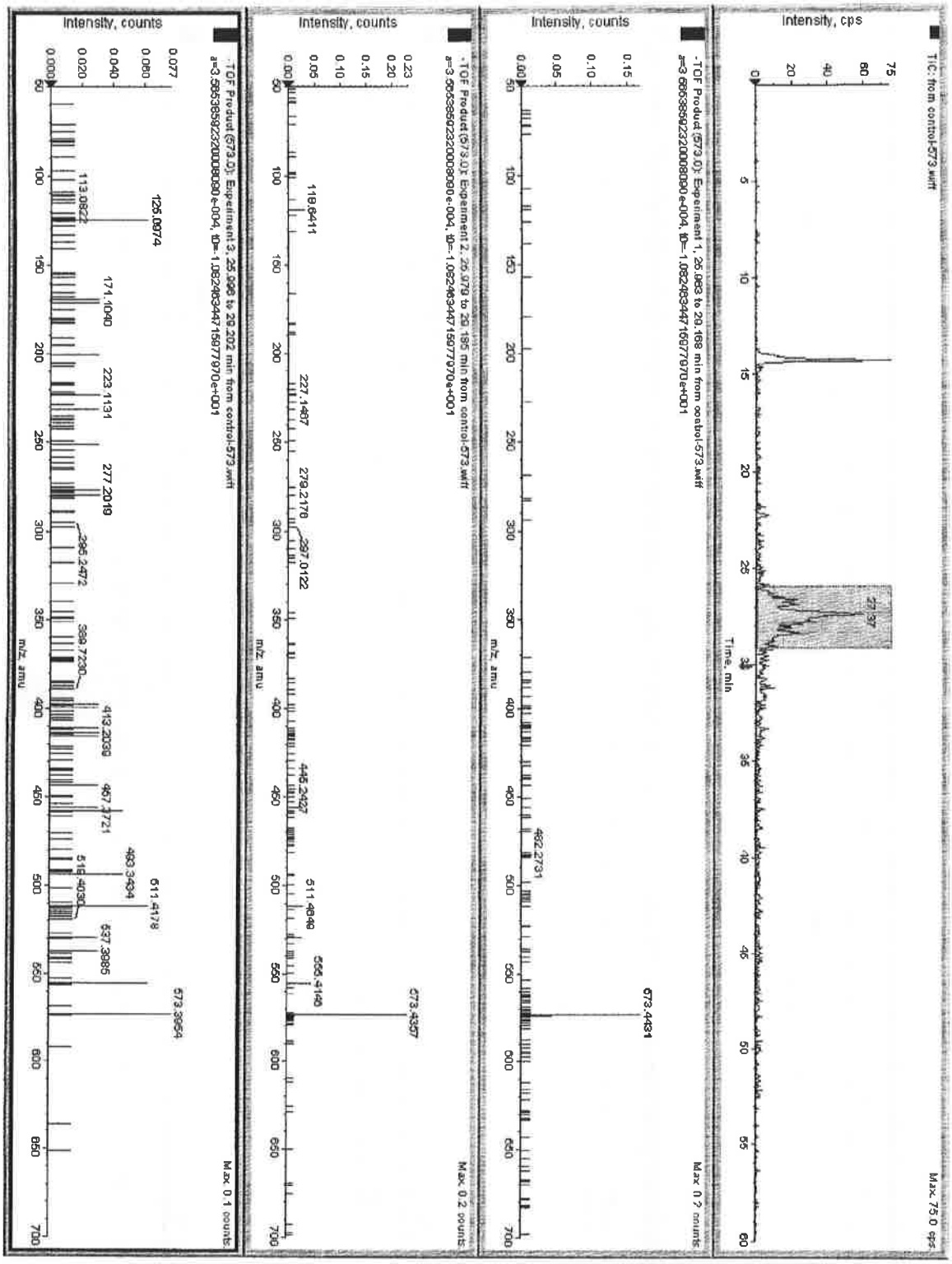

TIC: from control-573.wiff
Intensity, cps
Time, min
Max. 75.0 cps
-TOF Product (573.0): Experiment 1, 25.063 to 29.168 min from control-573.wiff
Intensity, counts
m/z, amu
673.4431
462.2731
Max. 0.2 counts
-TOF Product (573.0): Experiment 2, 25.079 to 29.185 min from control-573.wiff
673.4357
555.4140
511.4040
445.2427
397.0122
279.2176
227.1497
119.0411
Max. 0.2 counts
-TOF Product (573.0): Experiment 3, 25.998 to 29.202 min from control-573.wiff
573.3954
511.4178
493.3404
537.3985
467.3721
413.2039
389.7230
366.2472
277.2019
223.1131
171.1040
125.0974
113.0822
Max. 0.1 counts

**Figure 10**

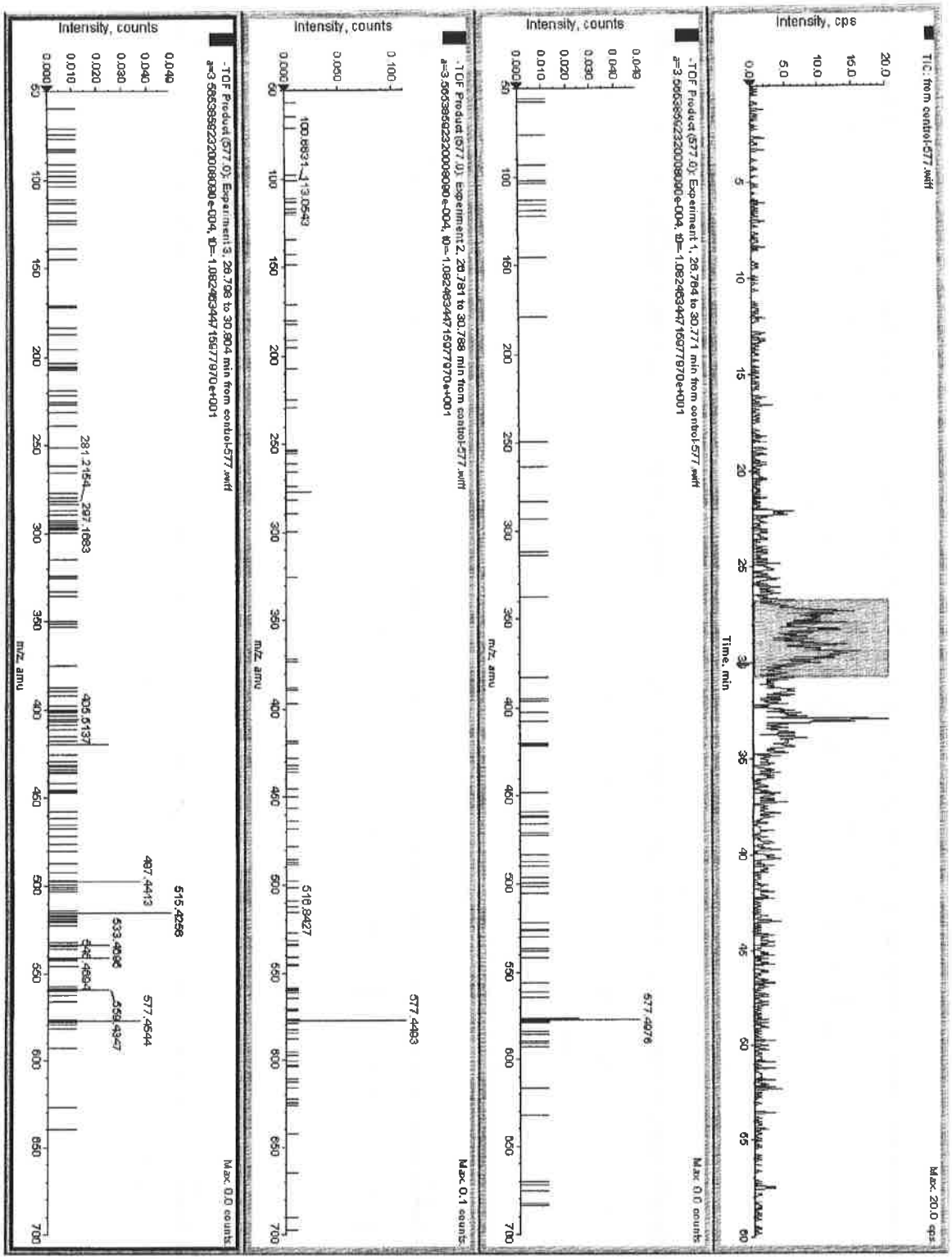

TIC: from control-577.wiff
Intensity, cps
Time, min
Max. 20.0 cps
-TOF Product (577.0): Experiment 1, 26.764 to 30.771 min from control-577.wiff
Intensity, counts
m/z, amu
577.4976
Max. 0.0 counts
-TOF Product (577.0): Experiment 2, 29.781 to 30.788 min from control-577.wiff
100.6691
113.0549
516.8427
577.4983
Max. 0.1 counts
-TOF Product (577.0): Experiment 3, 26.798 to 30.804 min from control-577.wiff
281.2154
297.1663
405.5137
487.4413
515.4258
533.4596
546.4894
559.4347
577.4544
Max. 0.0 counts

**Figure 11**

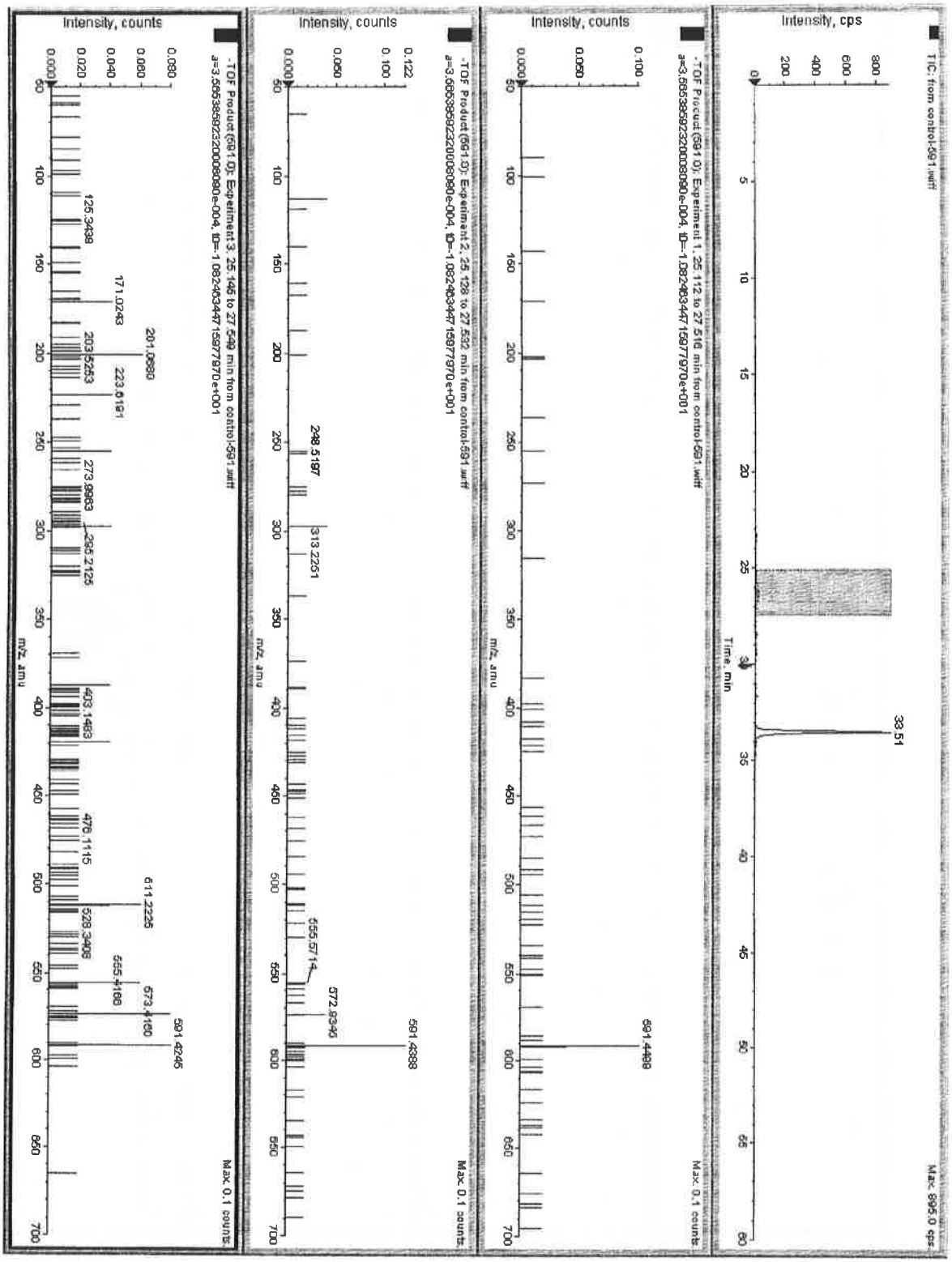

TIC: from control-591.wiff
Intensity, cps
Time, min
33.51
Max. 895.0 cps.
-TOF Product(591.0): Experiment 1, 25.112 to 27.516 min from control-591.wiff
Intensity, counts
m/z, amu
591.4499
Max. 0.1 counts.
-TOF Product(591.0): Experiment 2, 25.128 to 27.532 min from control-591.wiff
248.5197
313.2251
555.5714
572.9345
591.4368
-TOF Product(591.0): Experiment 3, 25.146 to 27.549 min from control-591.wiff
125.3438
171.0243
201.0880
223.0191
273.9963
295.2125
403.1483
476.1115
511.2225
528.3406
555.4166
573.4160
591.4245

**Figure 12**

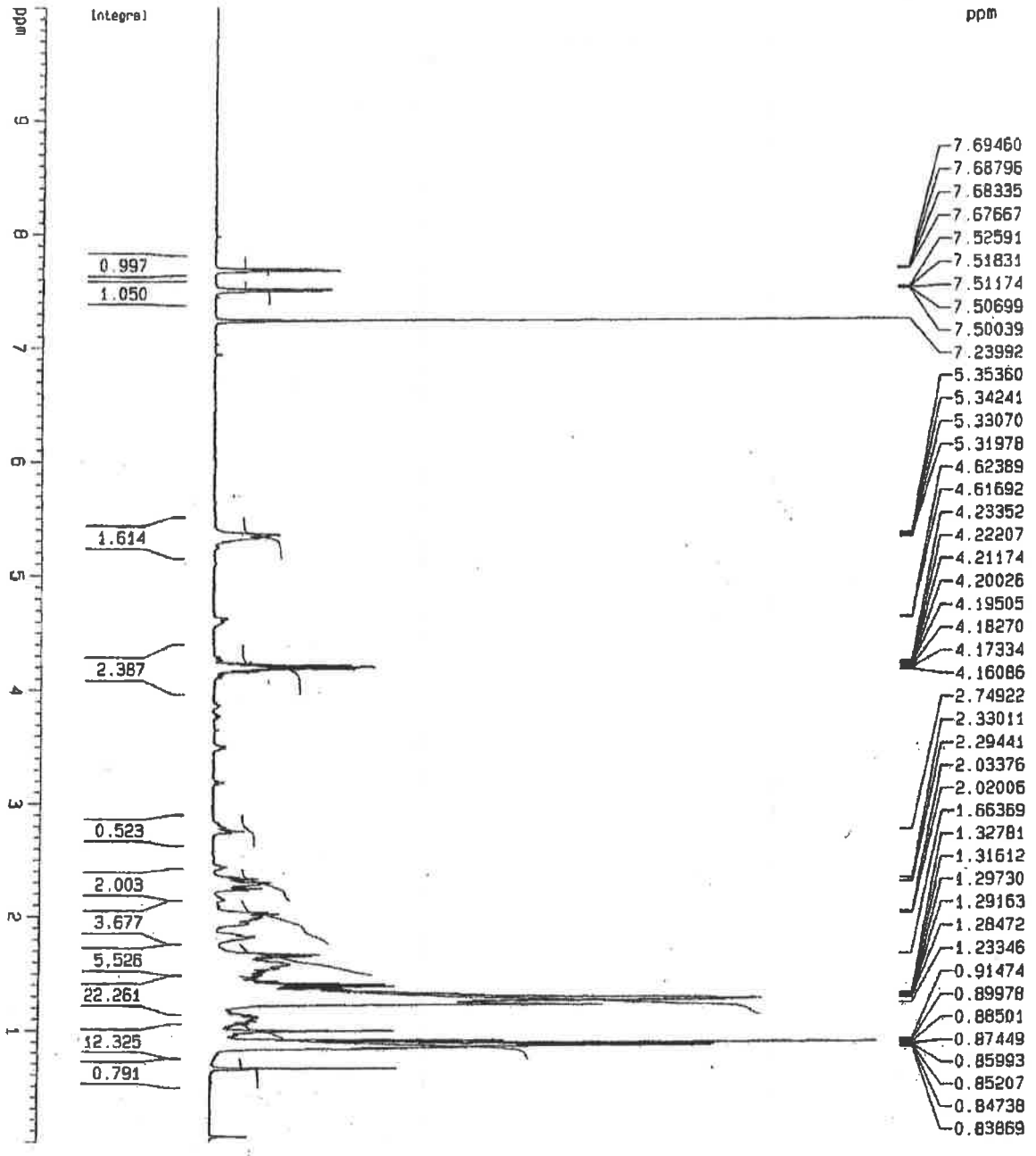

Integral
ppm
0.997
1.050
1.614
2.387
0.523
2.003
3.677
5.526
22.261
12.325
0.791
7.69460
7.68796
7.68335
7.67667
7.52591
7.51831
7.51174
7.50699
7.50039
7.23992
5.35360
5.34241
5.33070
5.31978
4.62389
4.61692
4.23352
4.22207
4.21174
4.20026
4.19505
4.18270
4.17334
4.16086
2.74922
2.33011
2.29441
2.03376
2.02006
1.66369
1.32781
1.31612
1.29730
1.29163
1.28472
1.23346
0.91474
0.89978
0.88501
0.87449
0.85993
0.85207
0.84738
0.83869

**Figure 13**

**(a)**

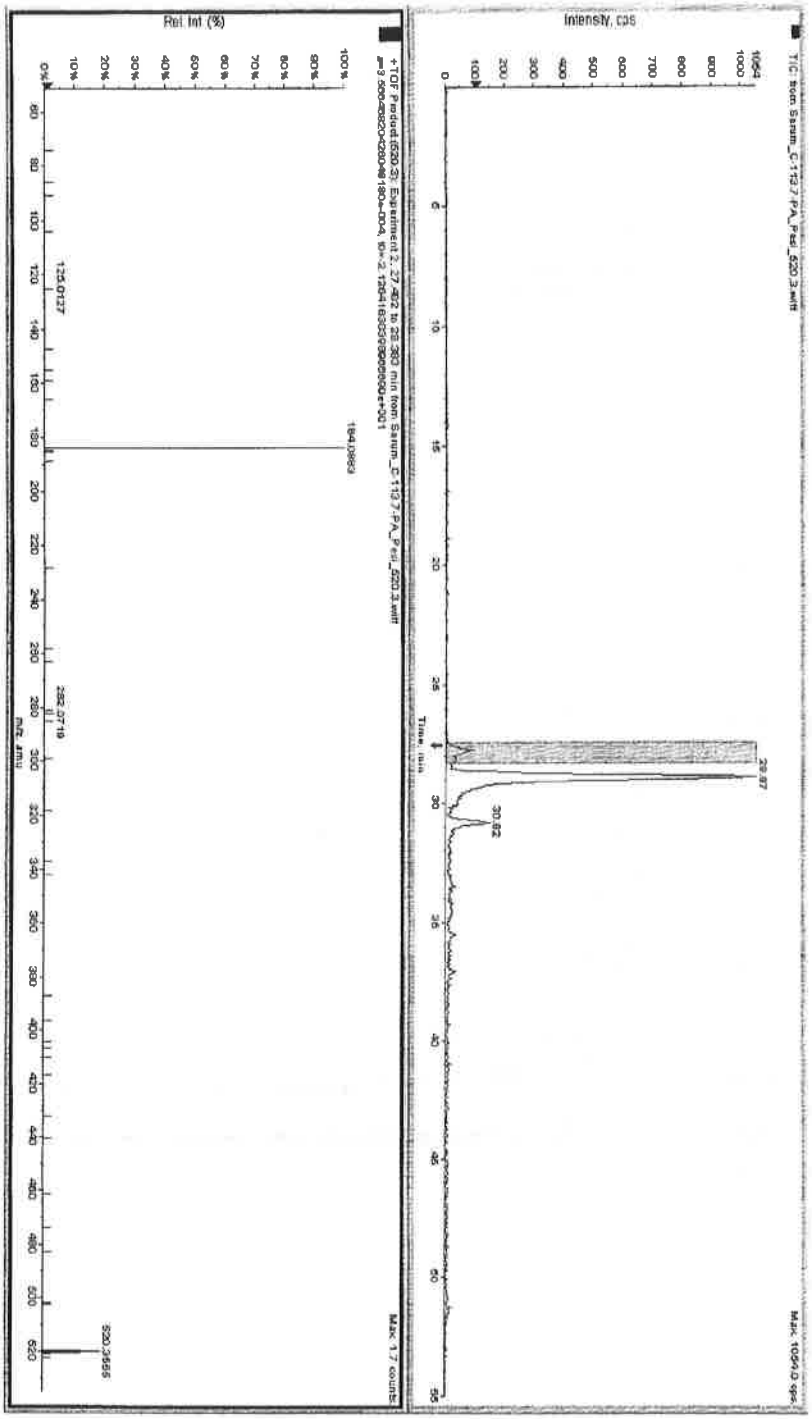

Rel. Int (%)
Intensity, cps
Time, min
m/z, amu
125.0127
184.0969
232.2719
520.3655
29.87
30.82

**Figure 14**

**(b)**

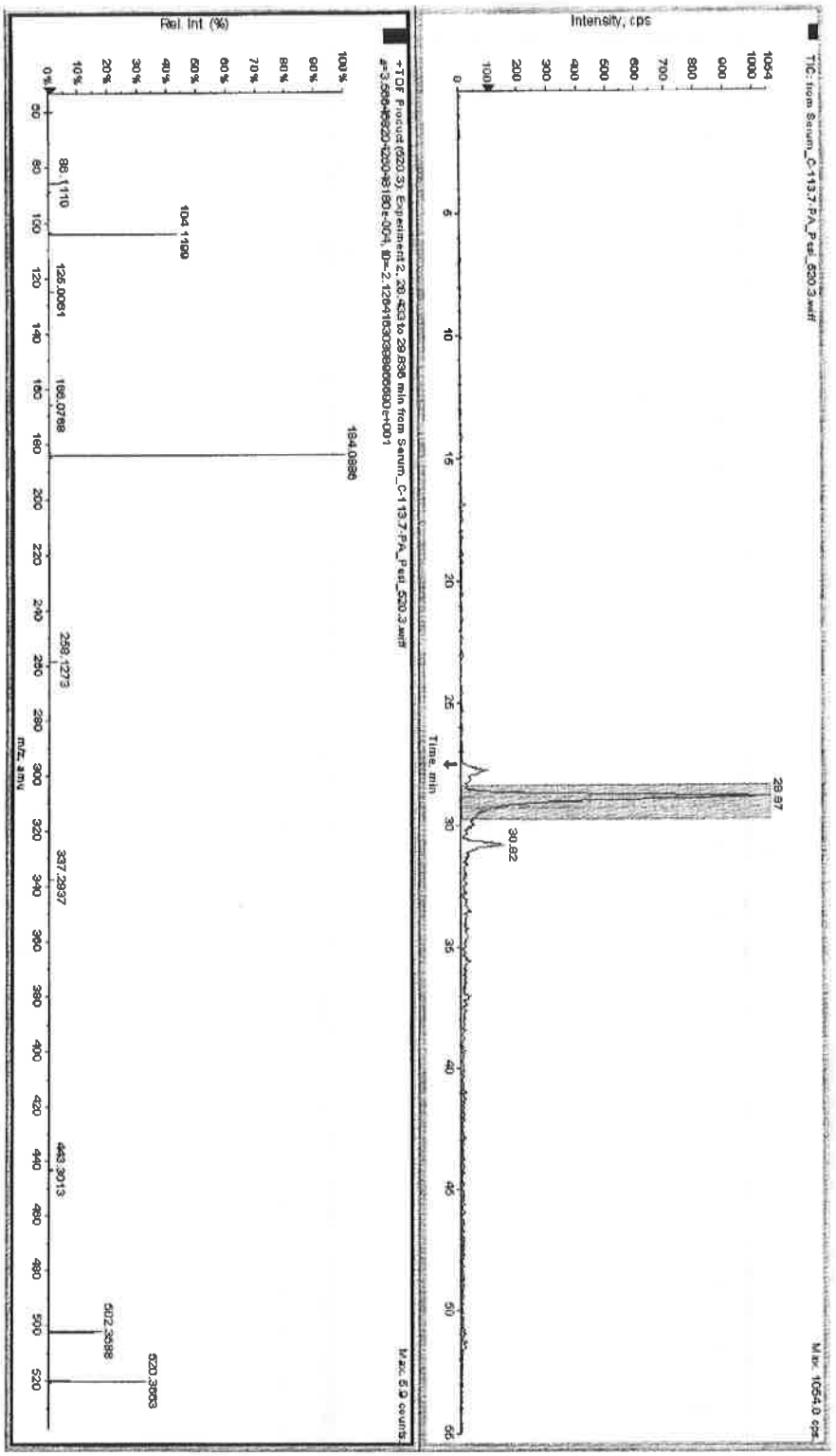



**Figure 14 (cont.)**

**(a)**

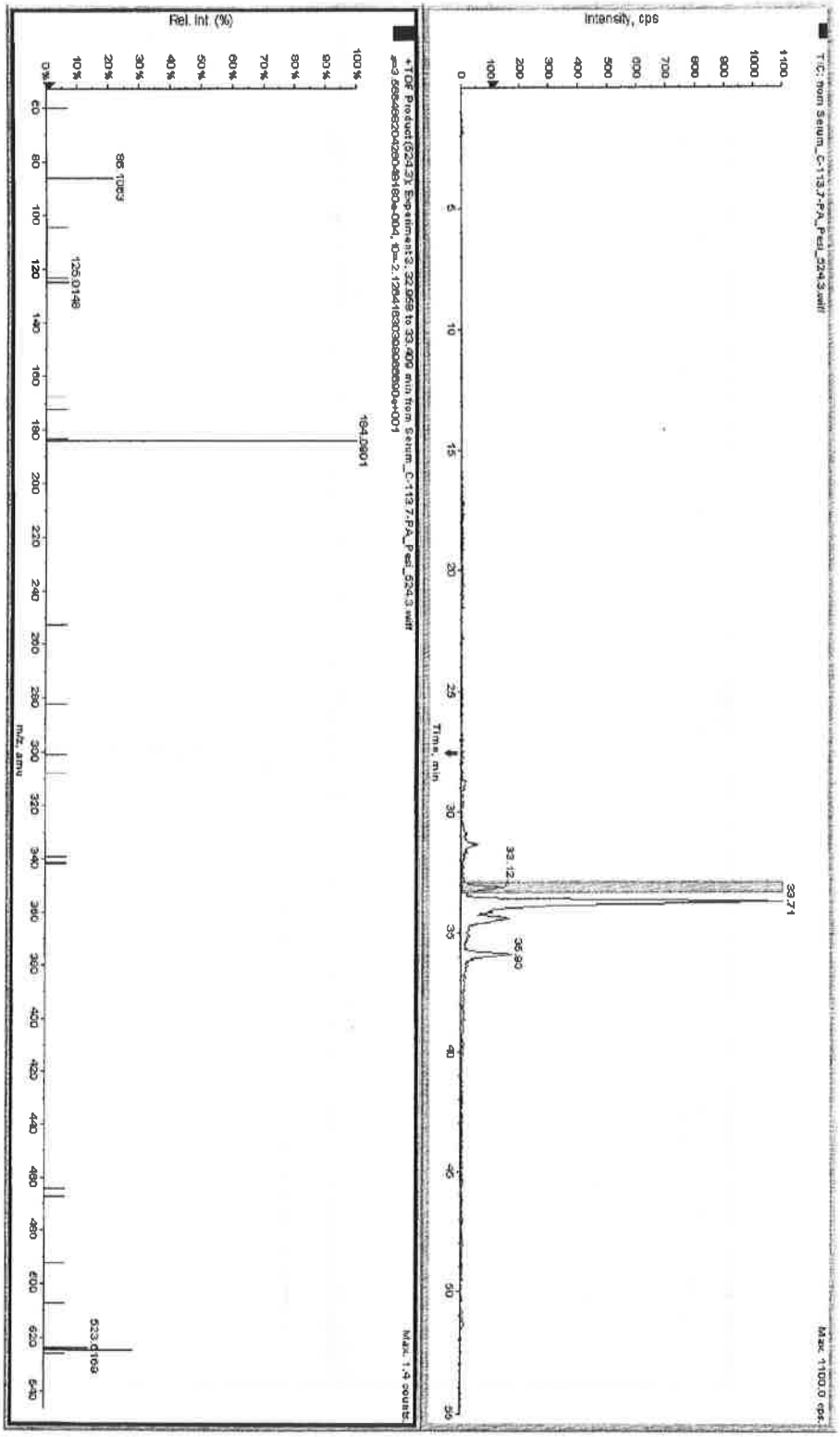

Rel. Int. (%)
Intensity, cps
Time, min
m/z, amu
33.12
33.71
36.80
164.0901
125.0148
95.1053
523.0169

**Figure 15**

**(b)**

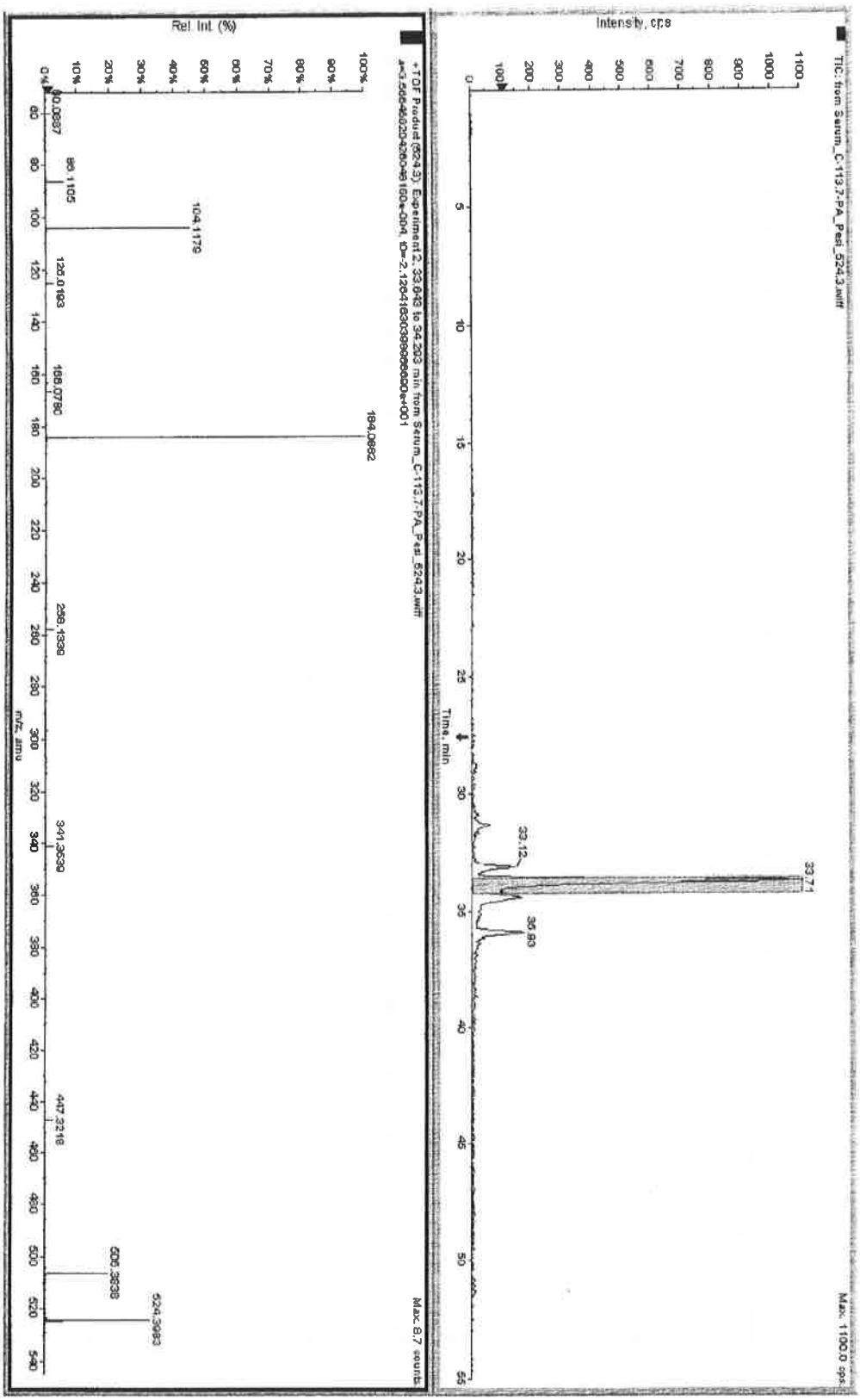



**Figure 15 (cont.)**

**(a)**

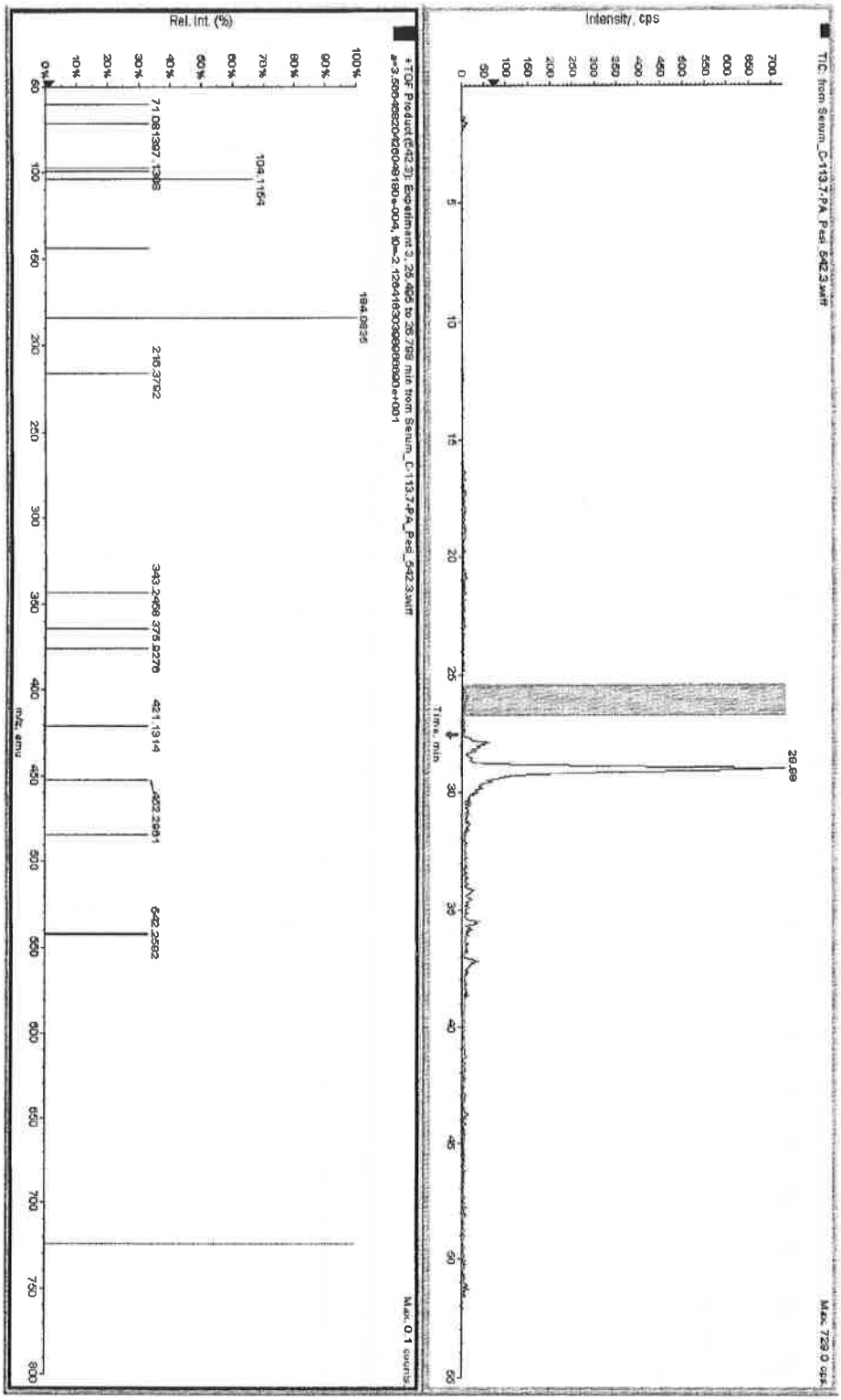

TIC: from Serum_C-113.7-PA_Pest_542.3.wiff
Intensity, cps
Time, min
29.89
Max. 729.0 cps.
+TOF Product (542.3): Experiment 3, 25.485 to 26.789 min from Serum_C-113.7-PA_Pest_542.3.wiff
Rel. Int. (%)
m/z, amu
71.0613
97.1398
104.1154
184.0835
216.3792
343.2456
379.2278
421.1314
462.2681
542.2582
Max. 0.1 counts

**Figure 16**

**(b)**

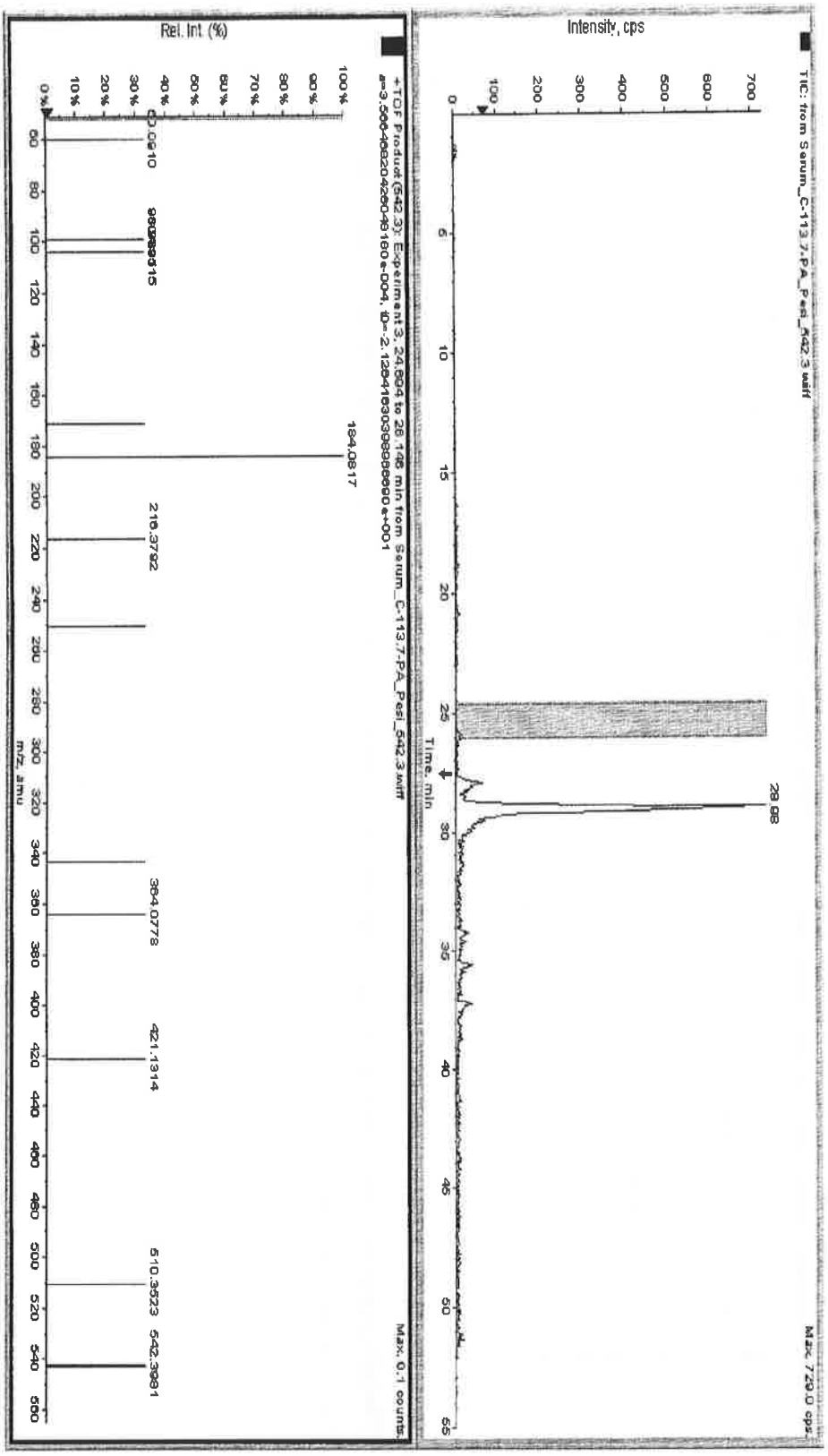



**Figure 16 (cont.)**

**(c)**

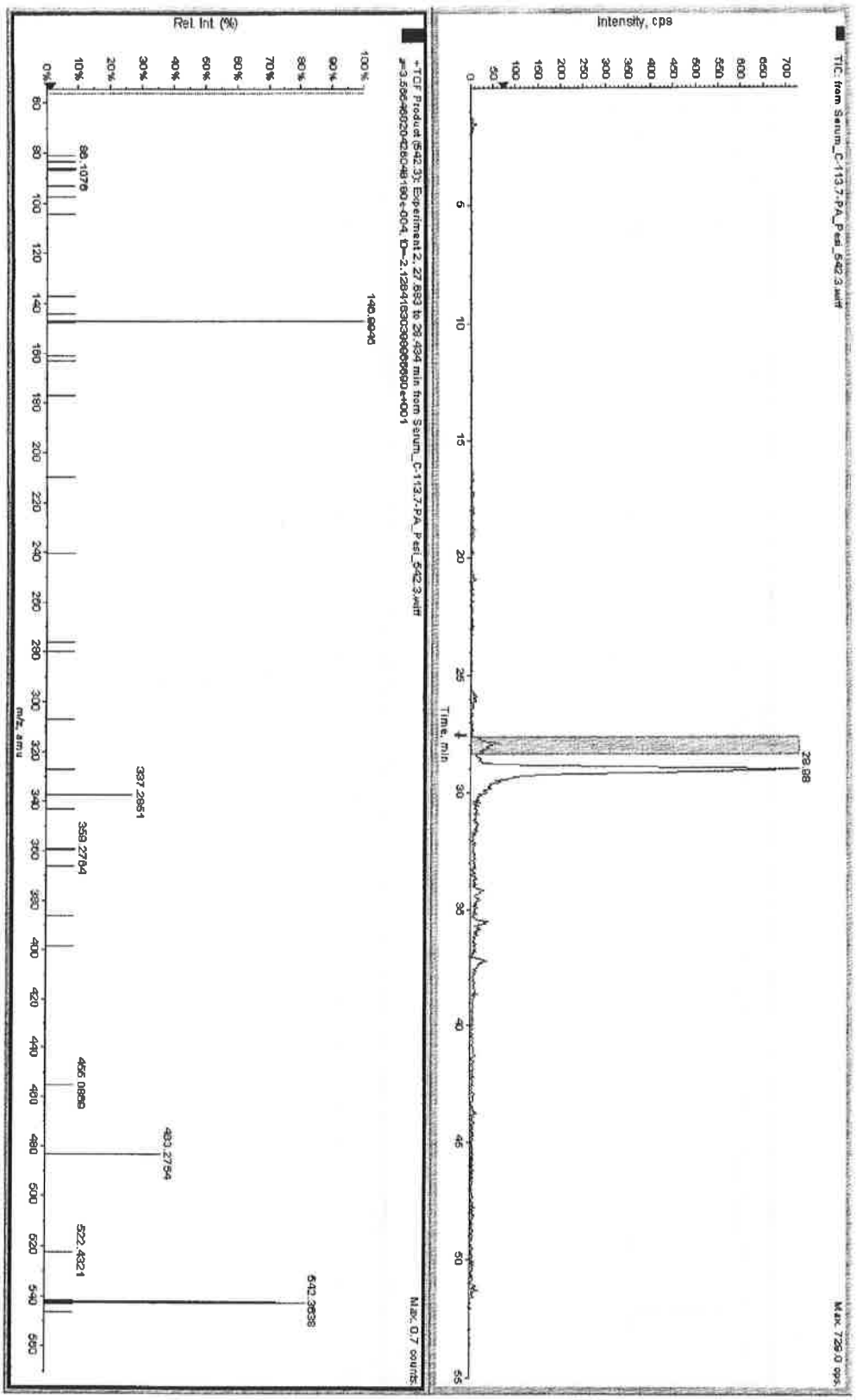



**Figure 16 (cont.)**

**(d)**

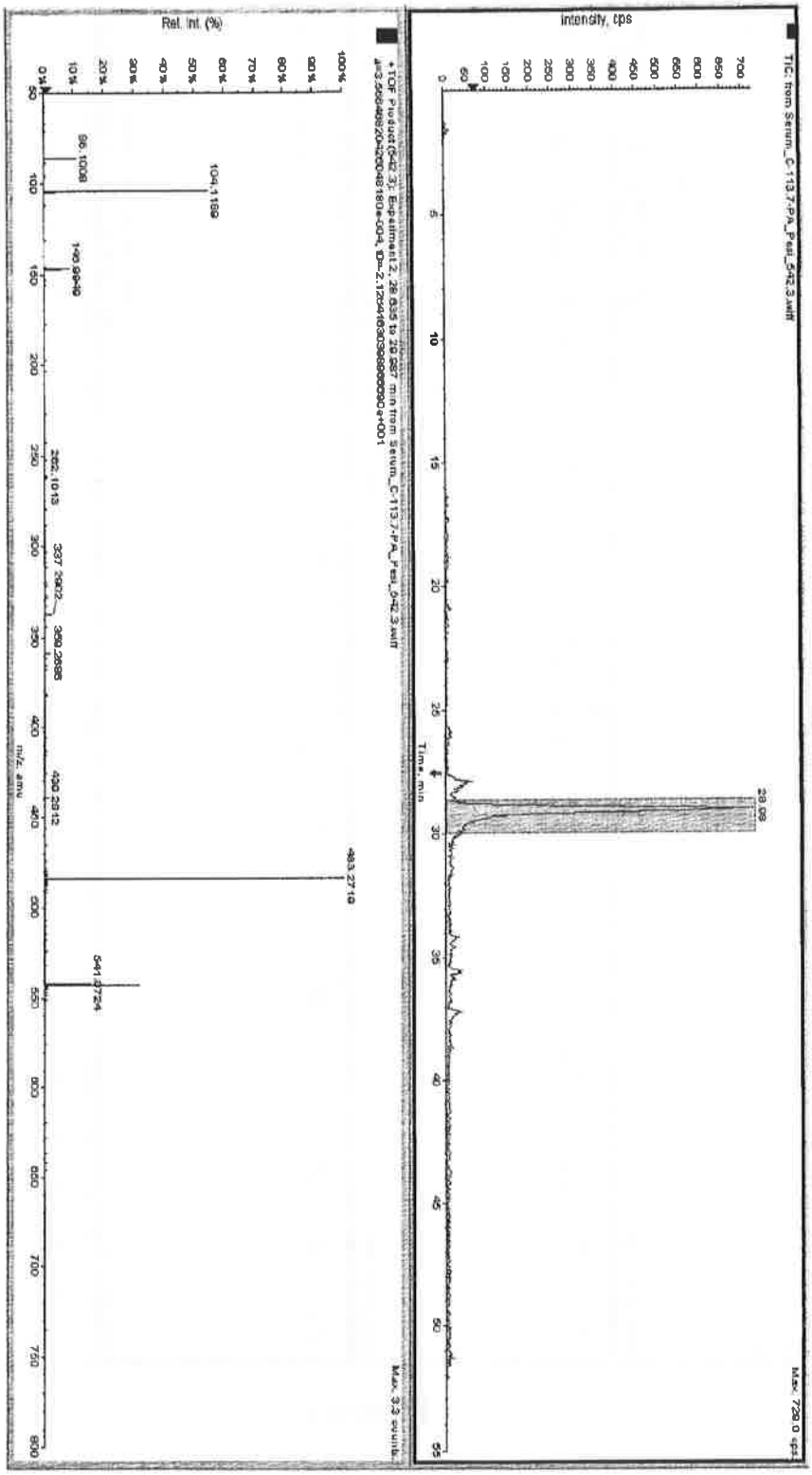



**Figure 16 (cont.)**

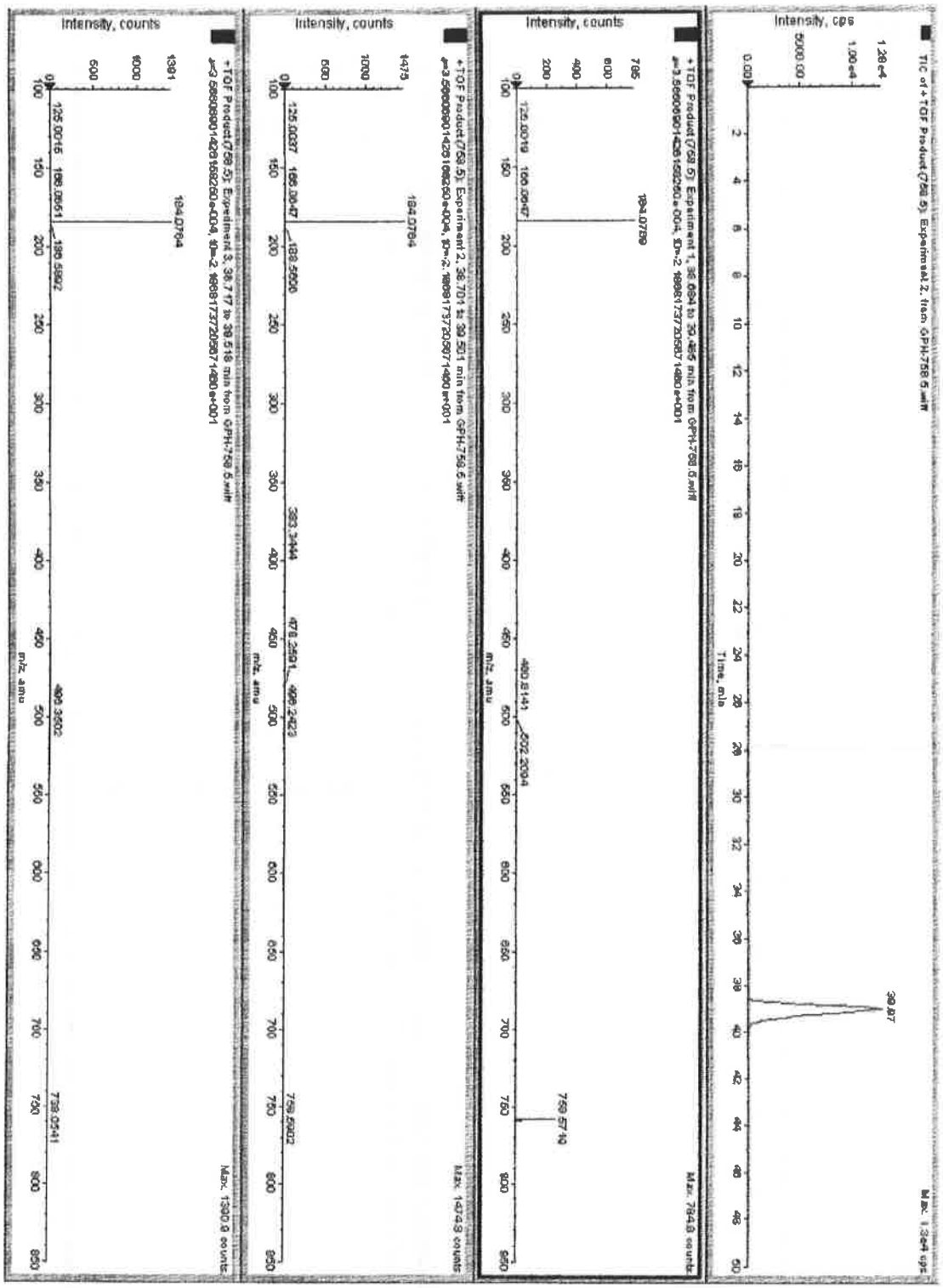

TIC of +TOF Product(759.5): Experiment 2: Item 6PH-759.5.wiff
Intensity, cps
Time, min
39.87
Max: 1.36e4 cps
+TOF Product(759.5): Experiment 1, 36.694 to 39.485 min from 6PH-759.5.wiff
Intensity, counts
184.0759
125.0019
169.0947
490.8141
502.2034
759.5710
Max: 7848 counts
+TOF Product(759.5): Experiment 2, 36.701 to 39.501 min from 6PH-759.5.wiff
Intensity, counts
184.0764
125.0037
169.0947
383.3444
478.2591
498.2423
759.5902
Max: 1473.0 counts
+TOF Product(759.5): Experiment 3, 36.717 to 39.518 min from 6PH-759.5.wiff
Intensity, counts
184.0764
125.0016
169.0951
498.3502
738.0541
Max: 1390.0 counts
m/z, amu

**Figure 17**

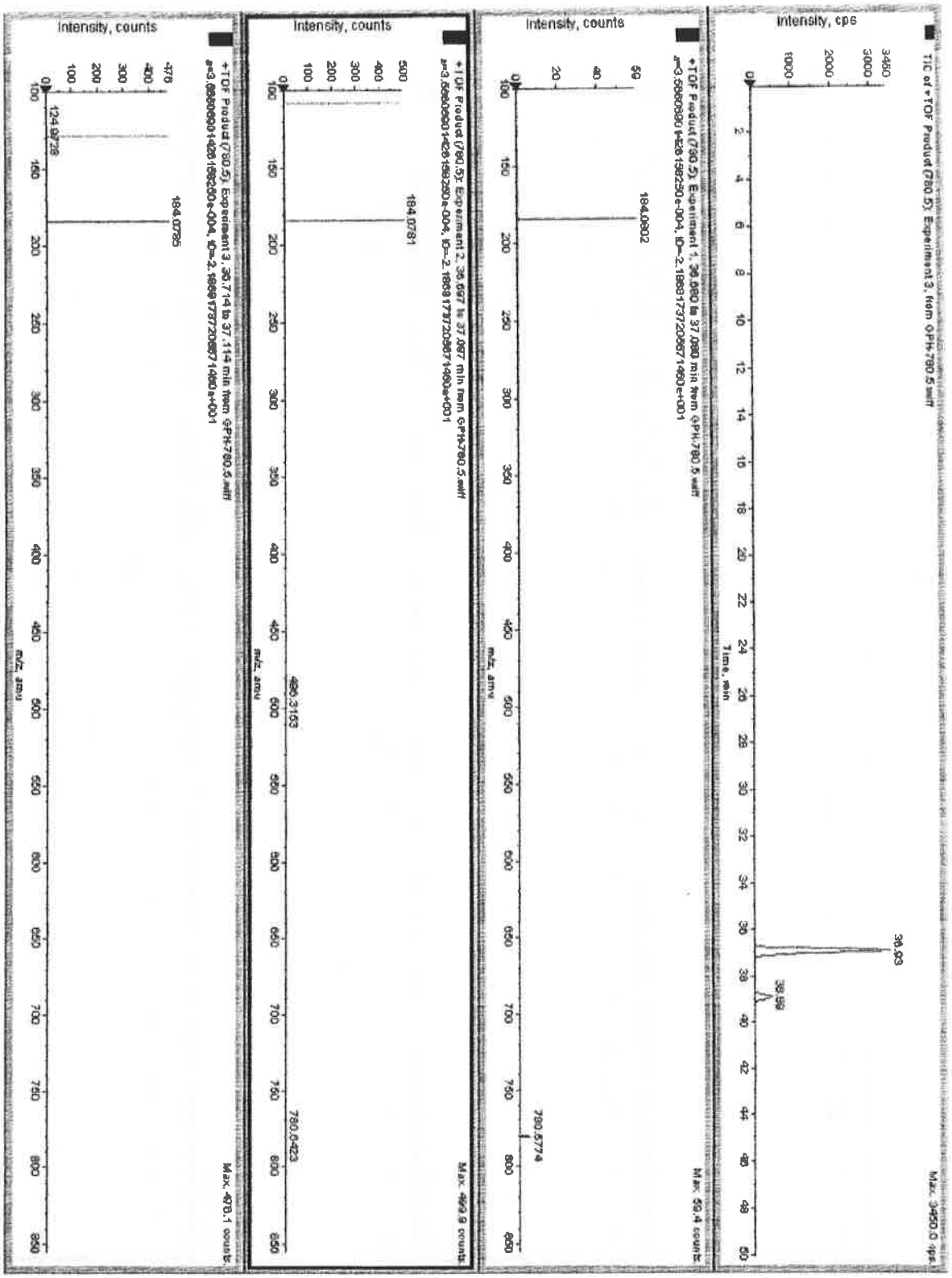

TIC of +TOF Product (780.5): Experiment 3, from GPH-780.5.wiff
Max: 3450.0 cps.
Intensity, cps
Time, min
38.93
38.56
+TOF Product (780.5): Experiment 1, 36.580 to 37.080 min from GPH-780.5.wiff
Max: 59.4 counts.
Intensity, counts
184.0802
780.5774
+TOF Product (780.5): Experiment 2, 36.647 to 37.047 min from GPH-780.5.wiff
Max: 499.9 counts.
Intensity, counts
184.0781
486.3153
780.6423
m/z, amu
+TOF Product (780.5): Experiment 3, 36.714 to 37.114 min from GPH-780.5.wiff
Max: 476.1 counts.
Intensity, counts
184.0785
124.0728
m/z, amu

**Figure 18**

**(a)**

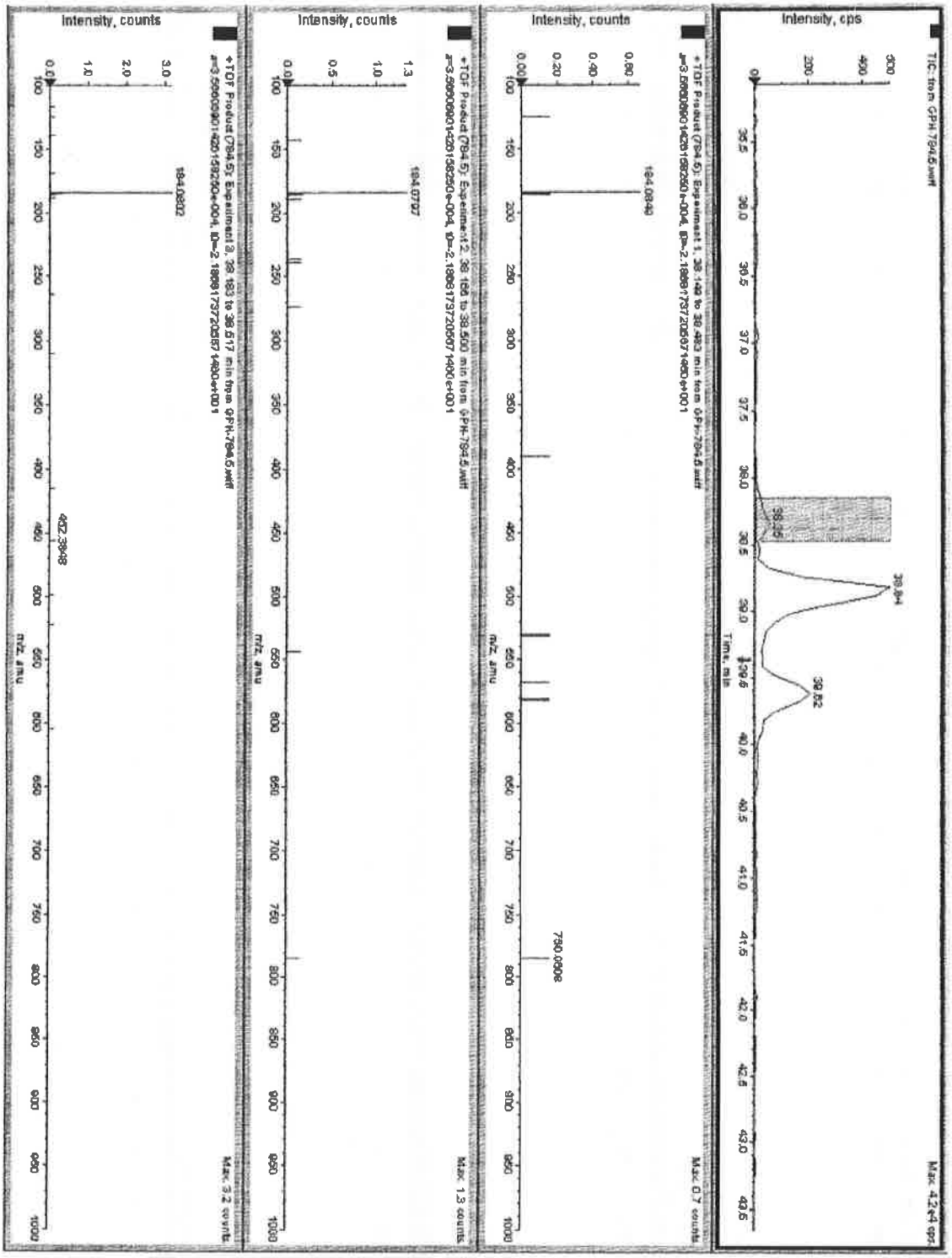

Intensity, cps
Time, min
Intensity, counts
m/z, amu
184.0840
790.0808
184.0707
184.0802
492.3848

**Figure 19**

**(b)**

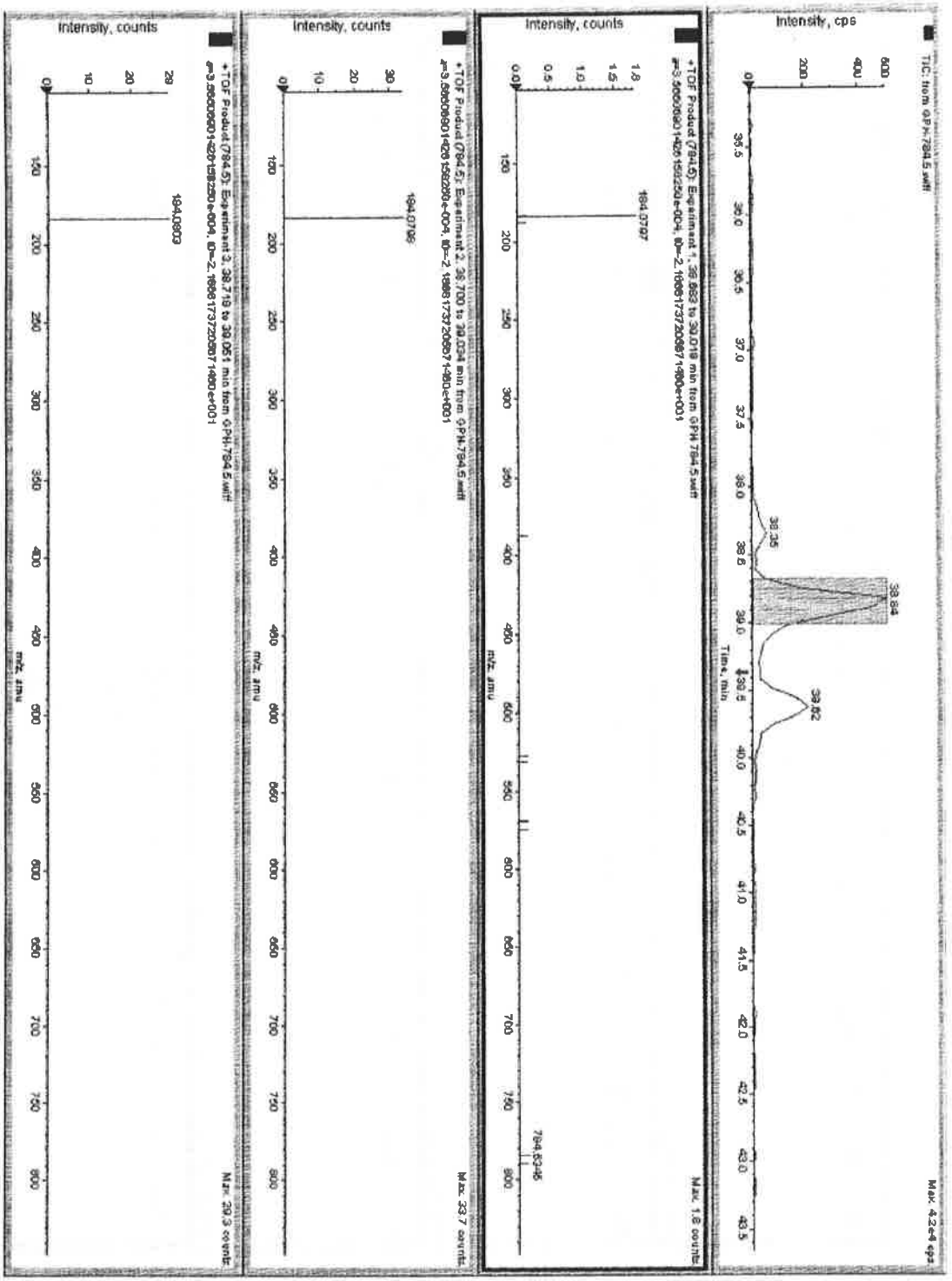



**Figure 19 (Cont.)**

**(c)**

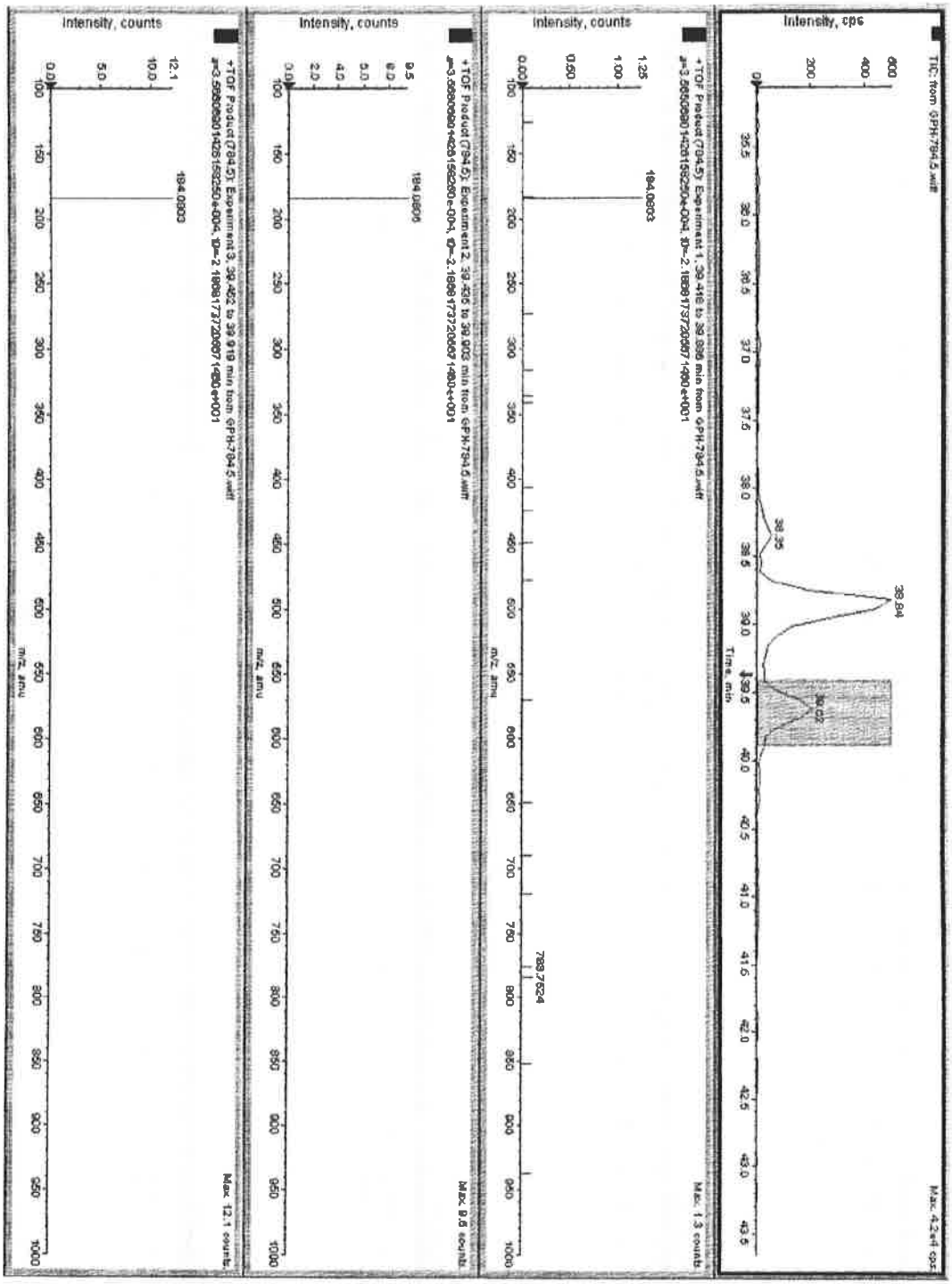



**Figure 19 (Cont.)**

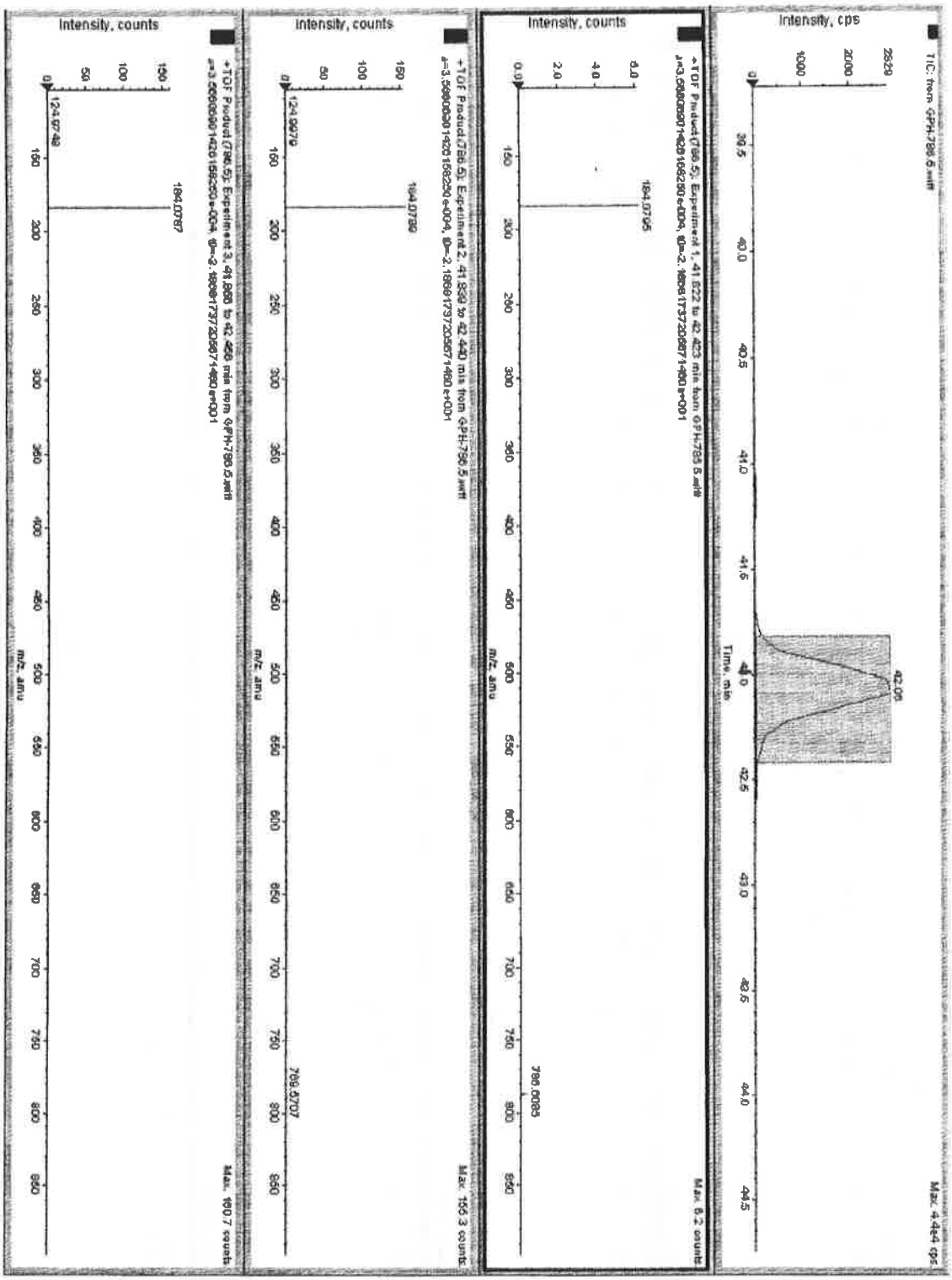

TIC: from GPH-786.5.wiff
Intensity, cps
Time, min
42.05
Max. 4464 cps
+TOF Product(786.5): Experiment 1, 41.622 to 42.423 min from GPH-786.5.wiff
Intensity, counts
184.0795
786.0083
Max. 8.2 counts
+TOF Product(786.5): Experiment 2, 41.838 to 42.440 min from GPH-786.5.wiff
Intensity, counts
124.9979
184.0789
786.0707
Max. 155.3 counts
+TOF Product(786.5): Experiment 3, 41.868 to 42.468 min from GPH-786.5.wiff
Intensity, counts
124.0748
184.0787
Max. 160.7 counts
m/z, amu

**Figure 20**

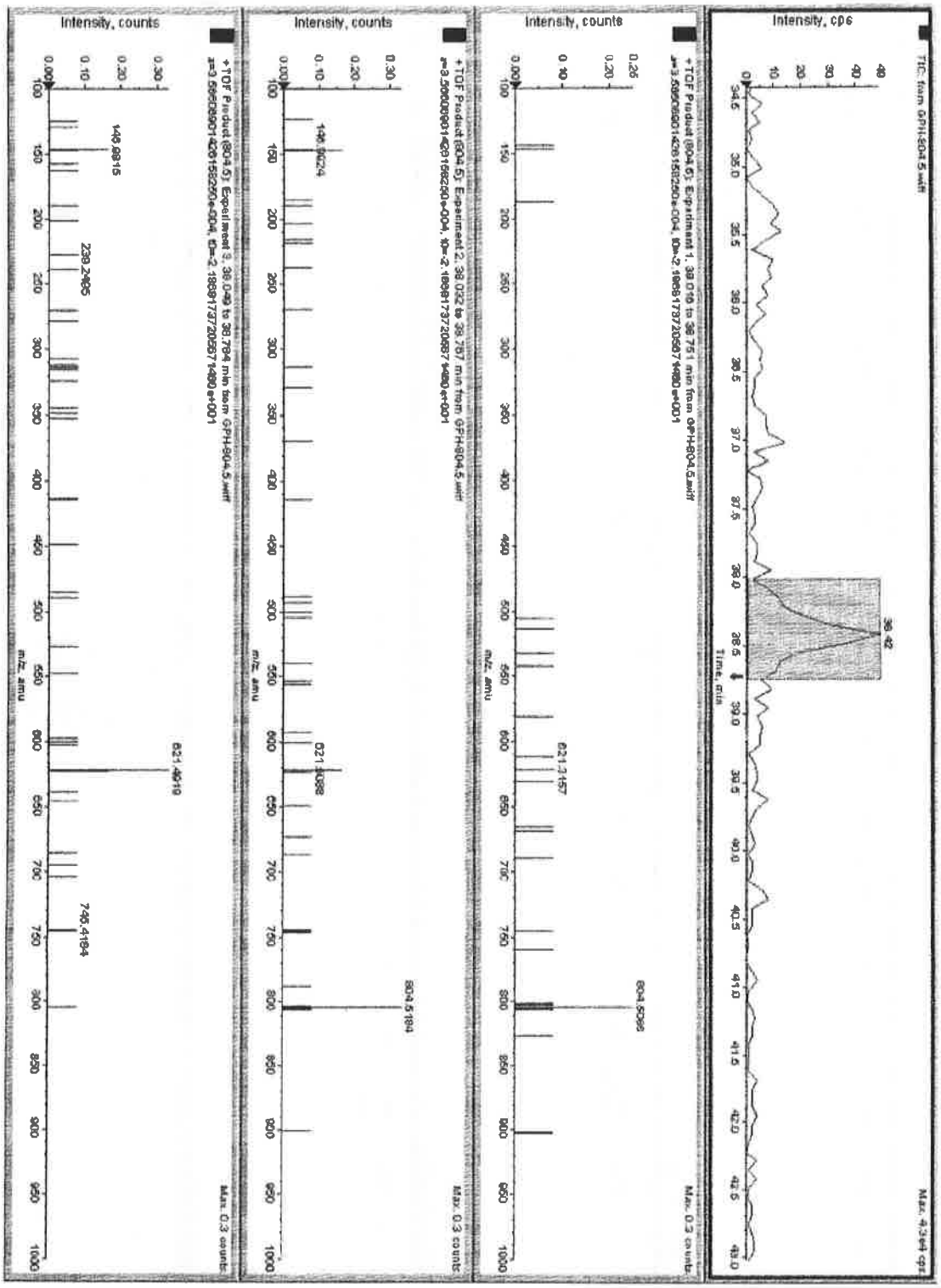

TIC: from GPH-804.5.wiff
Intensity, cps
Time, min
38.42
Max. 43e4 cps
+TOF Product (804.5): Experiment 1, 38.016 to 38.751 min from GPH-804.5.wiff
Intensity, counts
m/z, amu
804.5266
621.3157
Max. 0.3 counts
+TOF Product (804.5): Experiment 2, 38.032 to 38.767 min from GPH-804.5.wiff
804.5184
621.3088
149.0824
Max. 0.3 counts
+TOF Product (804.5): Experiment 3, 38.049 to 38.784 min from GPH-804.5.wiff
804.5184
621.4019
745.4184
239.2485
149.0815
Max. 0.3 counts

**Figure 21**

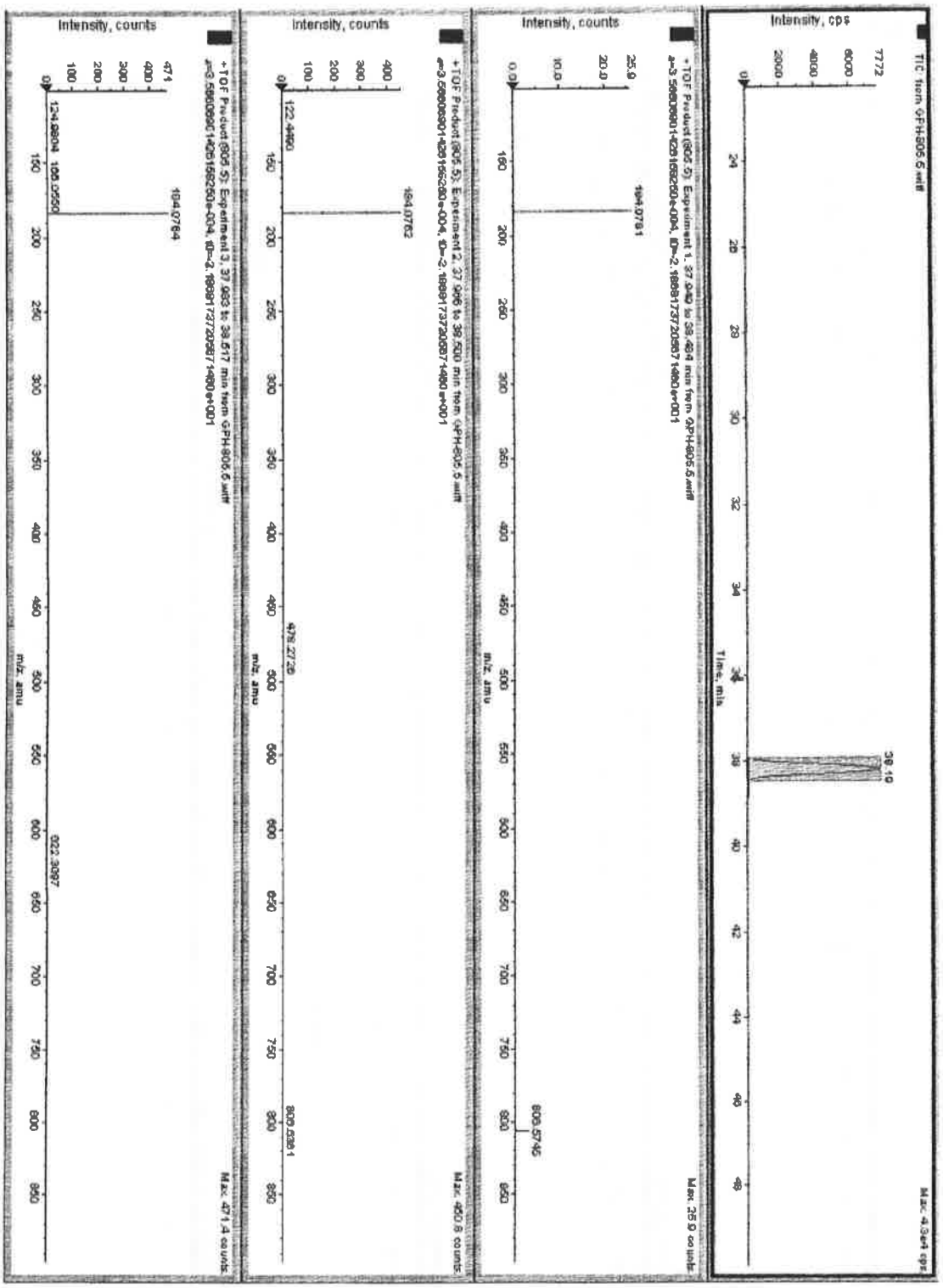

TIC from QPH-806.6.wiff
Intensity, cps
Time, min
38.19
Max: 4.3e4 cps
Intensity, counts
1644.0781
809.5745
Max: 25.9 counts
Intensity, counts
1644.0762
476.2728
809.6381
Max: 450.8 counts
Intensity, counts
1644.0764
1244.9804
1661.0550
922.3097
Max: 471.4 counts
m/z, amu

**Figure 22**

**(a)**

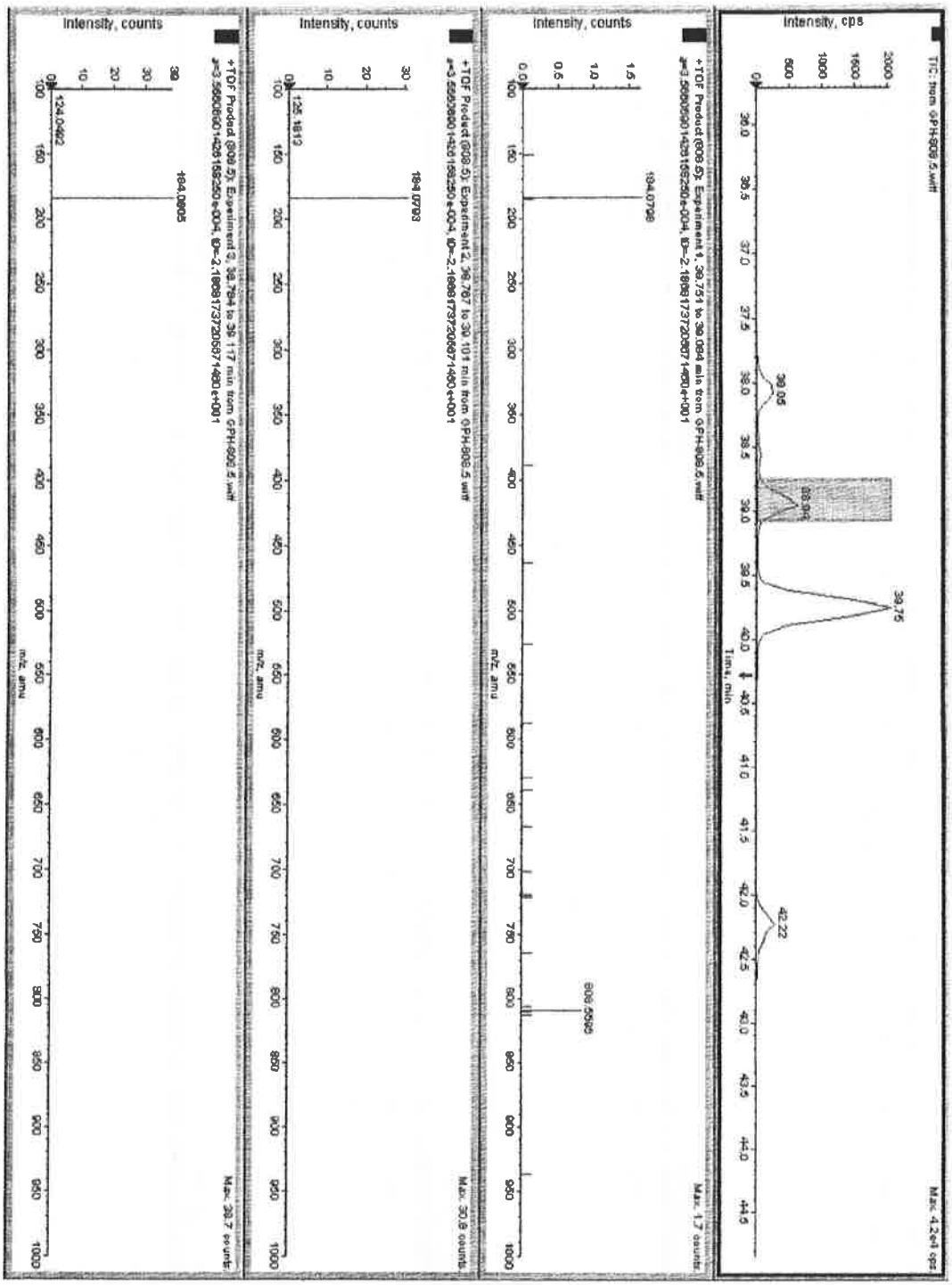

Intensity, cps
Time, min
39.05
39.75
42.22
Intensity, counts
m/z, amu
194.0798
809.5506
Intensity, counts
m/z, amu
194.0793
125.1612
Intensity, counts
m/z, amu
194.0805
124.0462

**Figure 23**

**(b)**

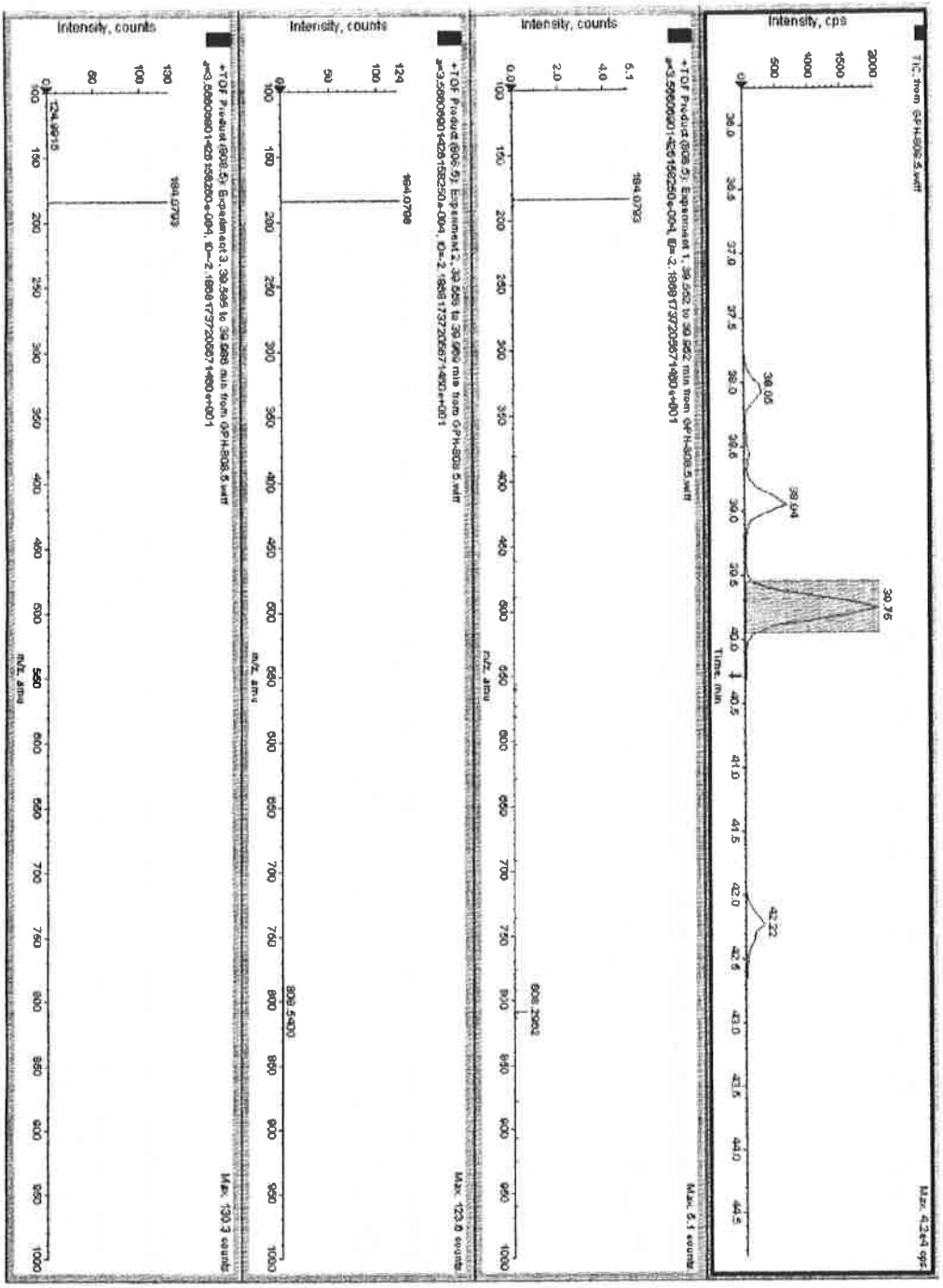



**Figure 23 (Cont.)**

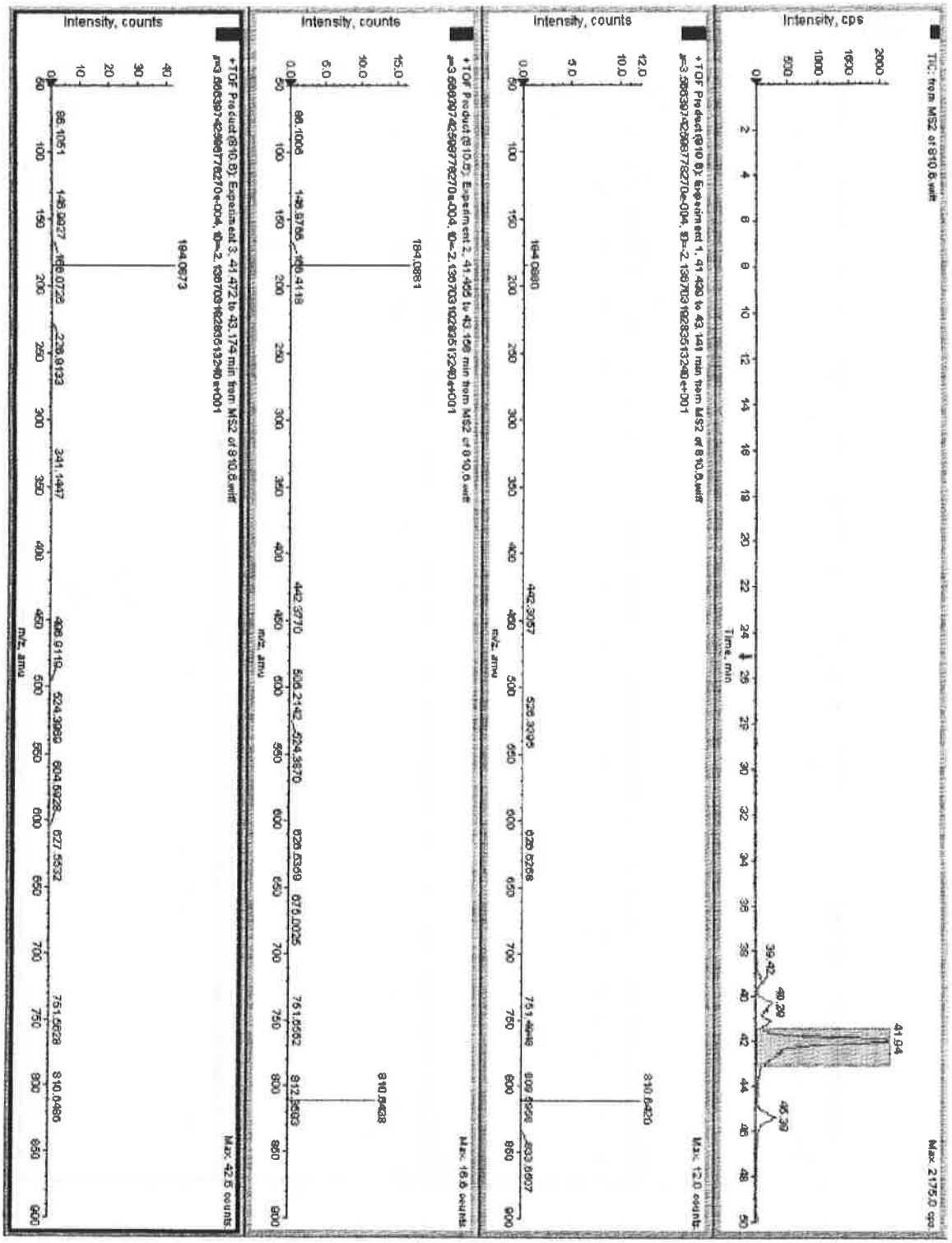

TIC: from MS2 of 810.8.wiff
Intensity, cps
Max. 2175.0 cps.
41.94
39.42
40.29
45.39
Time, min
+TOF Product(810.8): Experiment 1, 41.430 to 43.141 min from MS2 of 810.8.wiff
Intensity, counts
Max. 12.0 counts.
810.8420
184.0880
+TOF Product(810.8): Experiment 2, 41.455 to 43.158 min from MS2 of 810.8.wiff
Intensity, counts
Max. 16.6 counts.
810.8438
184.0881
+TOF Product(810.8): Experiment 3, 41.472 to 43.174 min from MS2 of 810.8.wiff
Intensity, counts
Max. 42.5 counts.
194.0873
m/z, amu

**Figure 24**

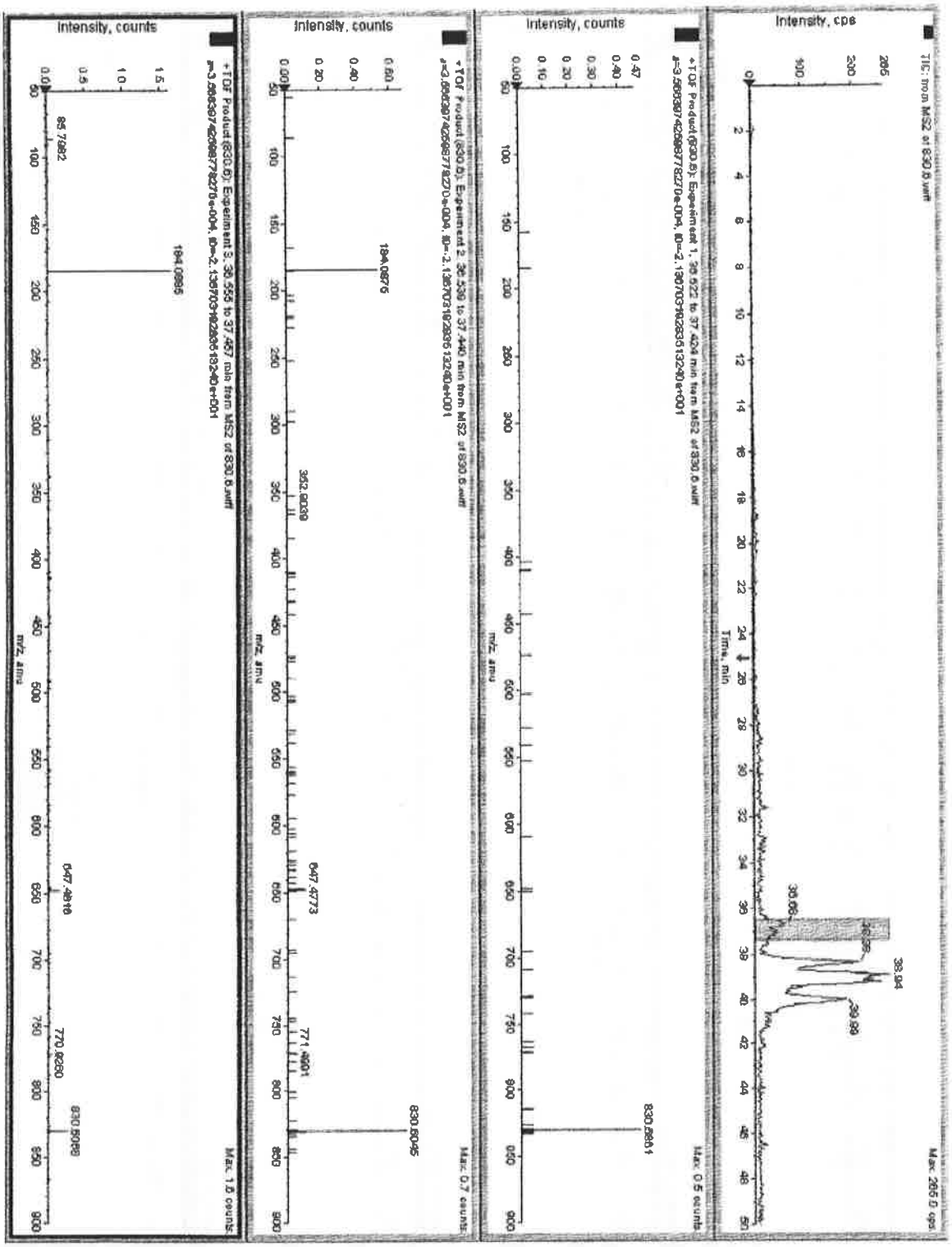

TIC: tmm MS2 of 830.6.wiff
Intensity, cps
Max: 285.0 cps
Time, min
35.06
38.39
38.94
39.99
+TOF Product (830.6): Experiment 1, 36.522 to 37.424 min from MS2 of 830.6.wiff
Intensity, counts
Max: 0.5 counts
830.8861
+TOF Product (830.6): Experiment 2, 36.539 to 37.440 min from MS2 of 830.6.wiff
Intensity, counts
Max: 0.7 counts
184.0875
352.0239
647.4773
771.4001
830.6045
+TOF Product (830.6): Experiment 3, 36.555 to 37.457 min from MS2 of 830.6.wiff
Intensity, counts
Max: 1.5 counts
184.0886
85.7982
647.4816
770.9280
830.5969
m/z, amu

**Figure 25**

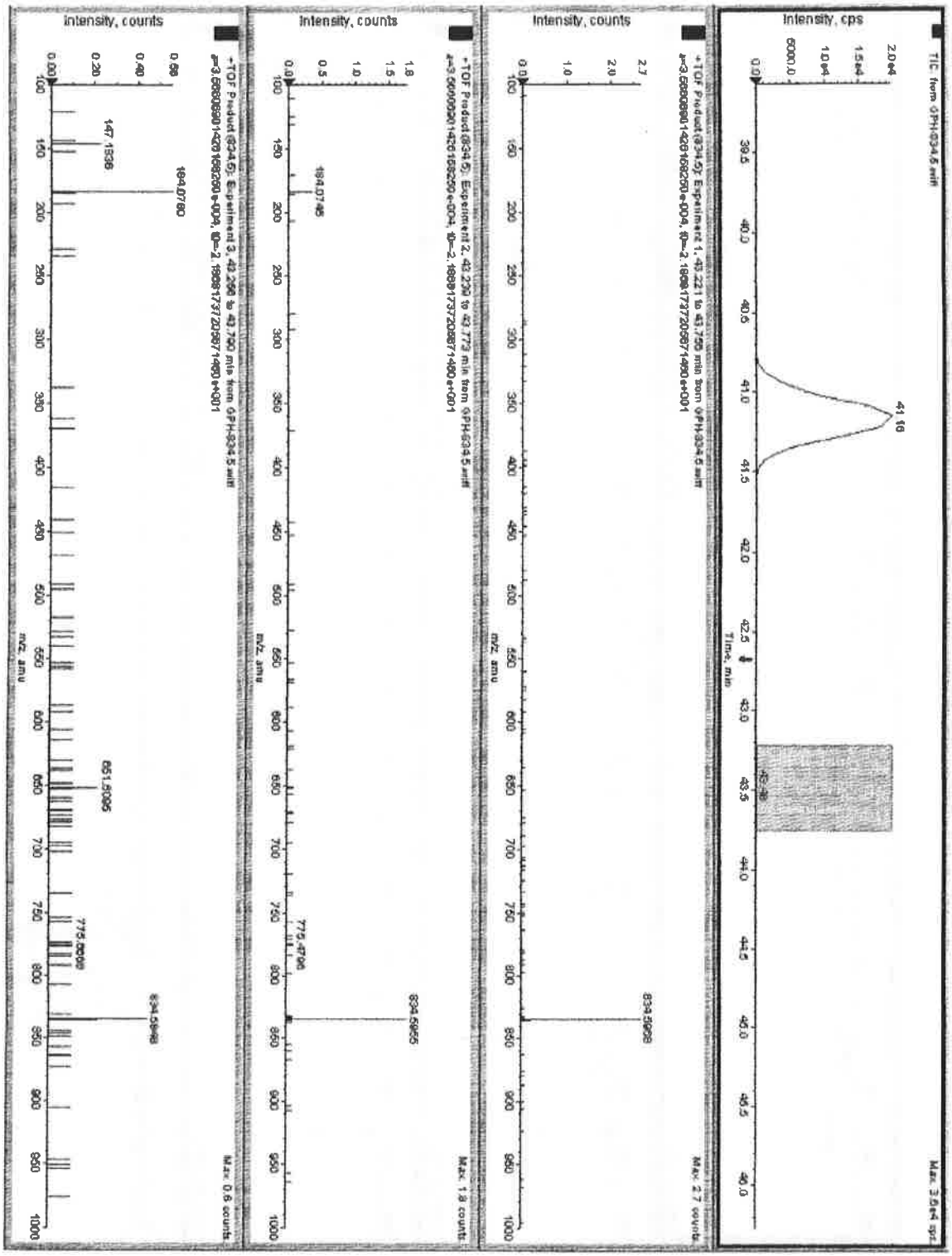

TIC from GPH-834.5.wiff
Intensity, cps
Time, min
41.16
Max. 3.6e4 cps
+TOF Product(834.5): Experiment 1, 43.221 to 43.750 min from GPH-834.5.wiff
Intensity, counts
834.5928
Max. 2.7 counts
+TOF Product(834.5): Experiment 2, 43.239 to 43.773 min from GPH-834.5.wiff
834.5855
775.4796
194.0745
Max. 1.9 counts
+TOF Product(834.5): Experiment 3, 43.266 to 43.700 min from GPH-834.5.wiff
834.5848
775.5056
651.5095
194.0780
147.1536
Max. 0.6 counts
m/z, amu

**Figure 26**

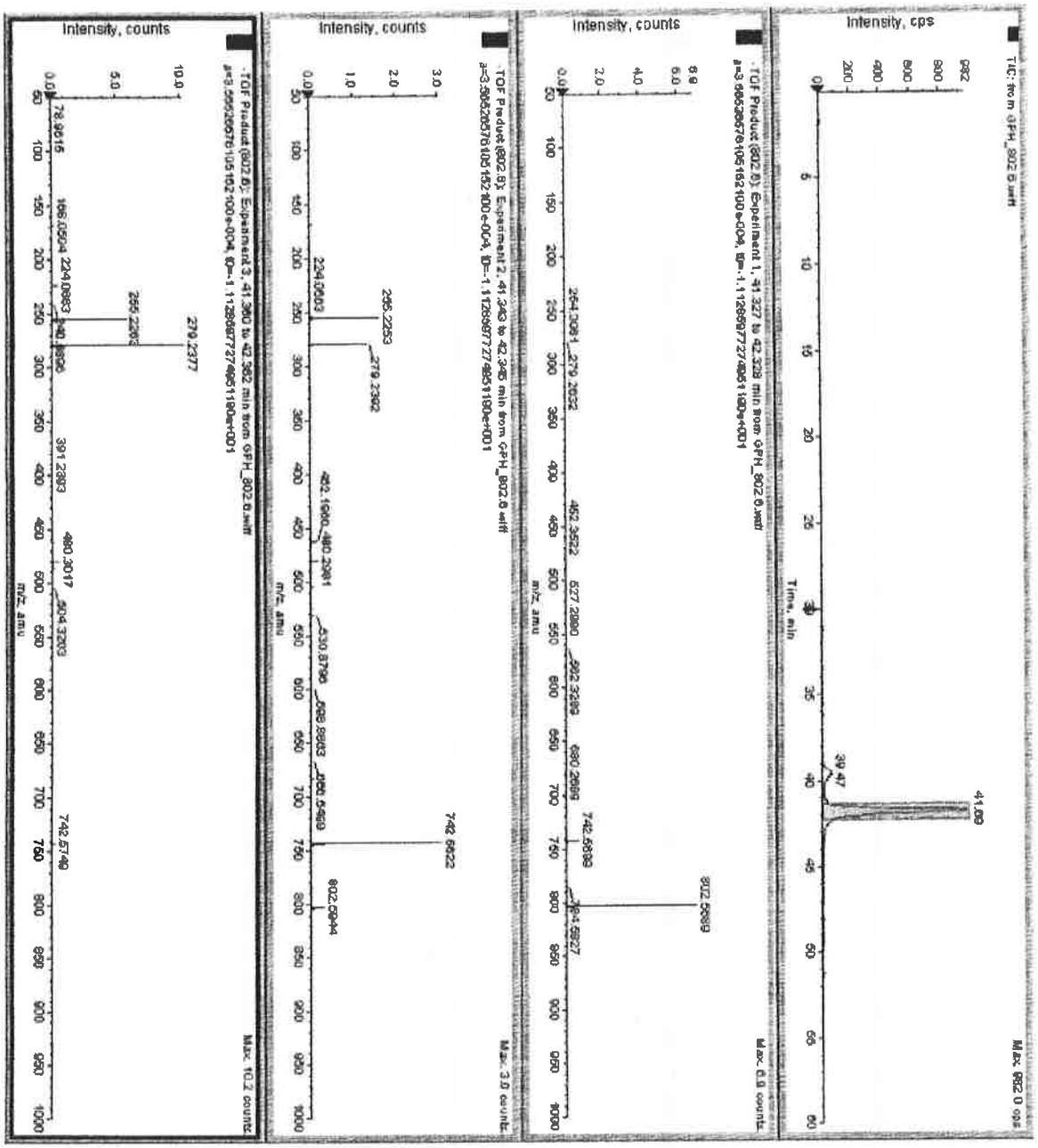

Intensity, cps
Time, min
41.09
39.47
Intensity, counts
m/z, amu
902.5889
742.5938
254.2091
279.2032
Intensity, counts
m/z, amu
742.5922
295.2253
279.2362
Intensity, counts
m/z, amu
279.2377
78.9615
391.2393
480.3017
742.5749

**Figure 27**

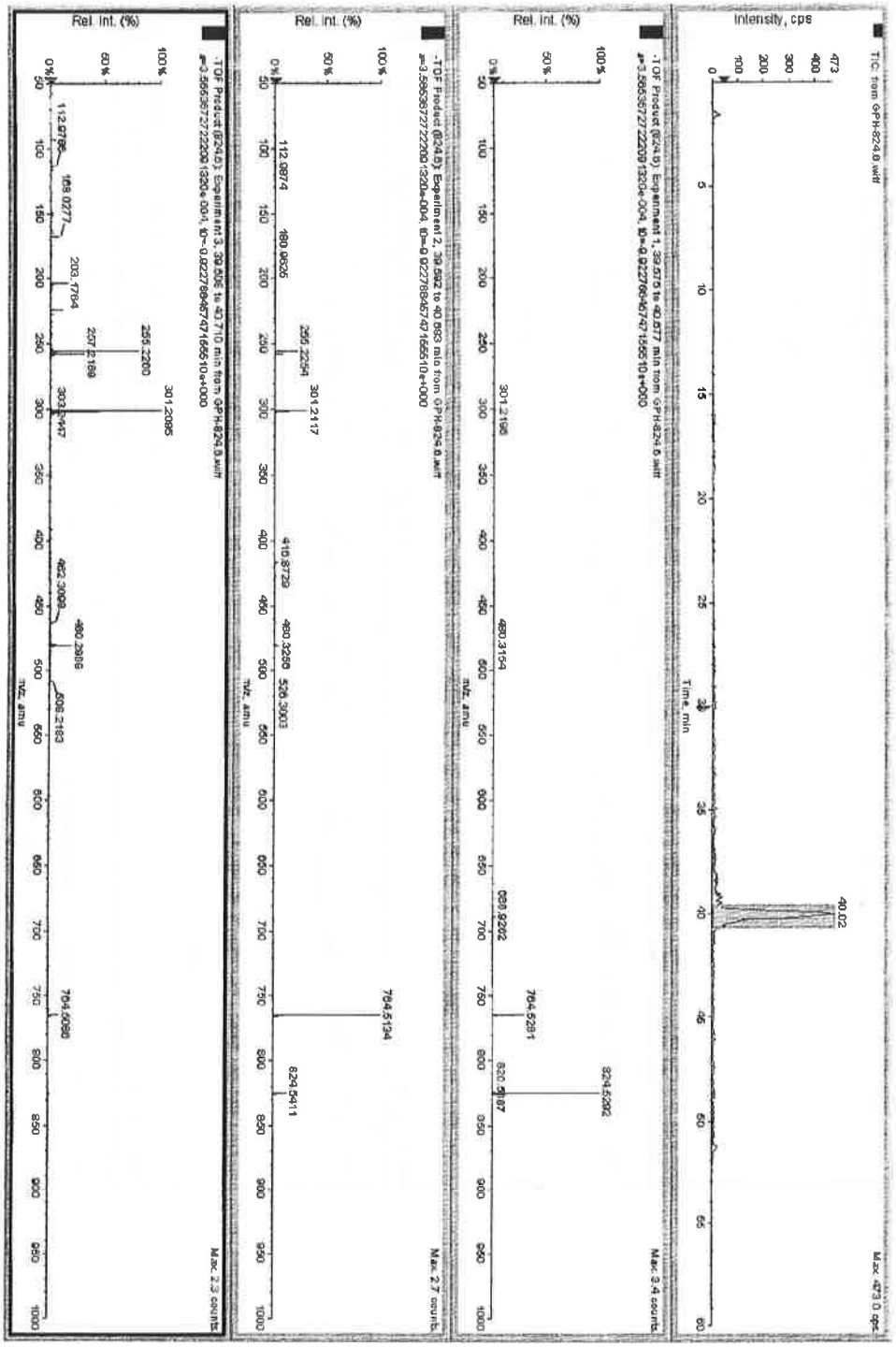

TIC from GPH-824.9.wiff
Intensity, cps
Time, min
40.02
Max. 473.0 cps.
Rel. Int. (%)
m/z, amu
301.2196
480.3154
769.5281
824.5292
Max. 3.4 counts.
Rel. Int. (%)
m/z, amu
112.0874
180.0626
256.2254
301.2117
410.8729
480.3288
526.3003
794.5134
824.5411
Max. 27 counts.
Rel. Int. (%)
m/z, amu
112.0796
168.0277
203.1764
257.2169
301.2085
462.3098
480.2986
506.2163
794.5098
Max. 2.3 counts.

**Figure 28**

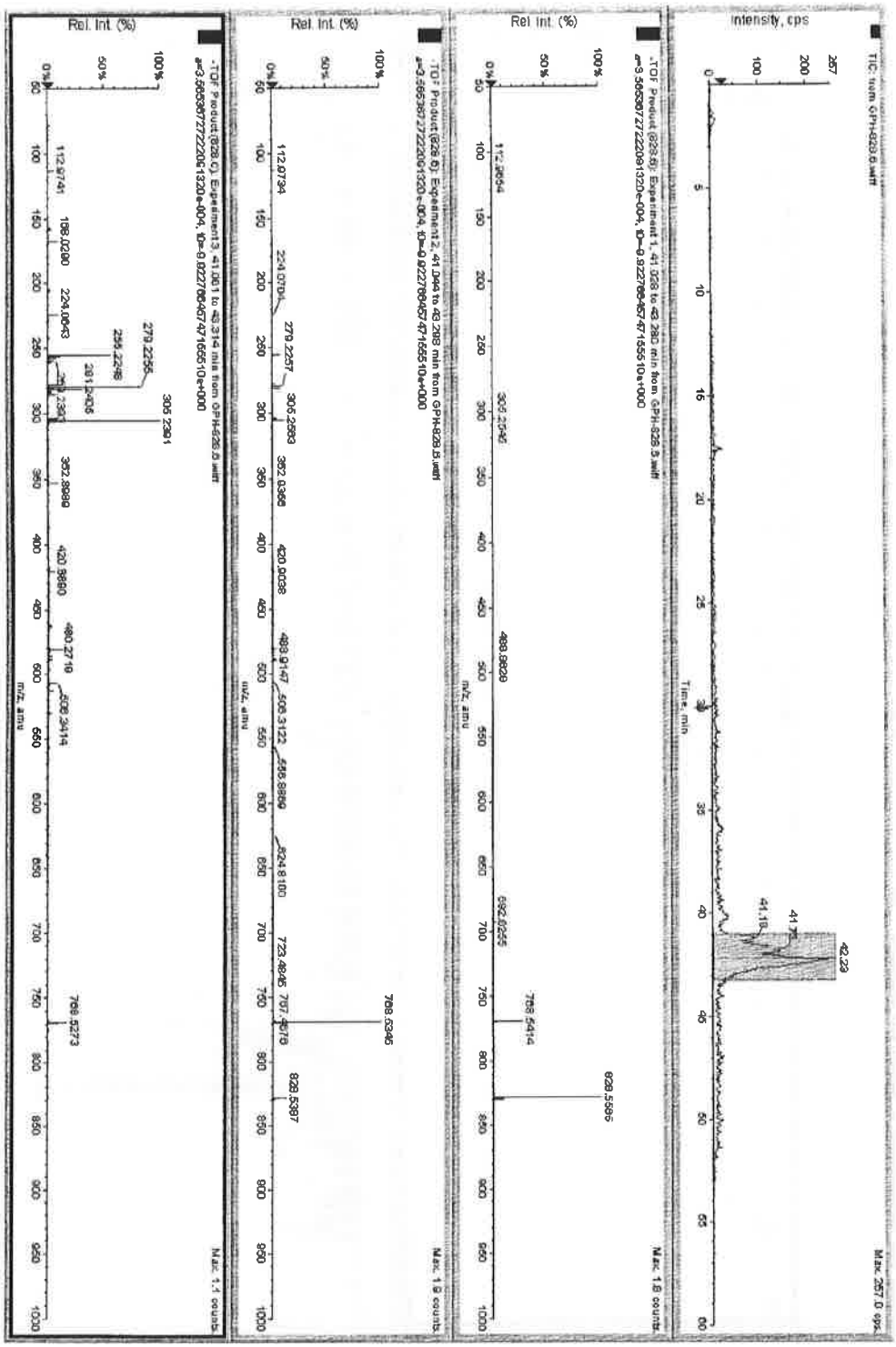

TIC: twin GPH-629.6.wiff
Intensity, cps
Time, min
42.23
41.75
41.19
Max. 267.0 cps.
Rel. Int. (%)
m/z, amu
112.9654
306.2945
488.9629
692.0225
788.5414
828.5985
Max. 1.6 counts
112.9734
224.0704
279.2257
306.2383
382.9368
420.9038
488.9147
508.3122
598.9889
824.8100
723.4045
757.4576
788.5346
828.5387
Max. 1.9 counts
112.9741
106.0280
224.0643
279.2295
259.2246
201.2426
305.2361
352.8989
420.8880
480.2719
508.3414
788.5273
Max. 1.1 counts

**Figure 29**

**(a)**

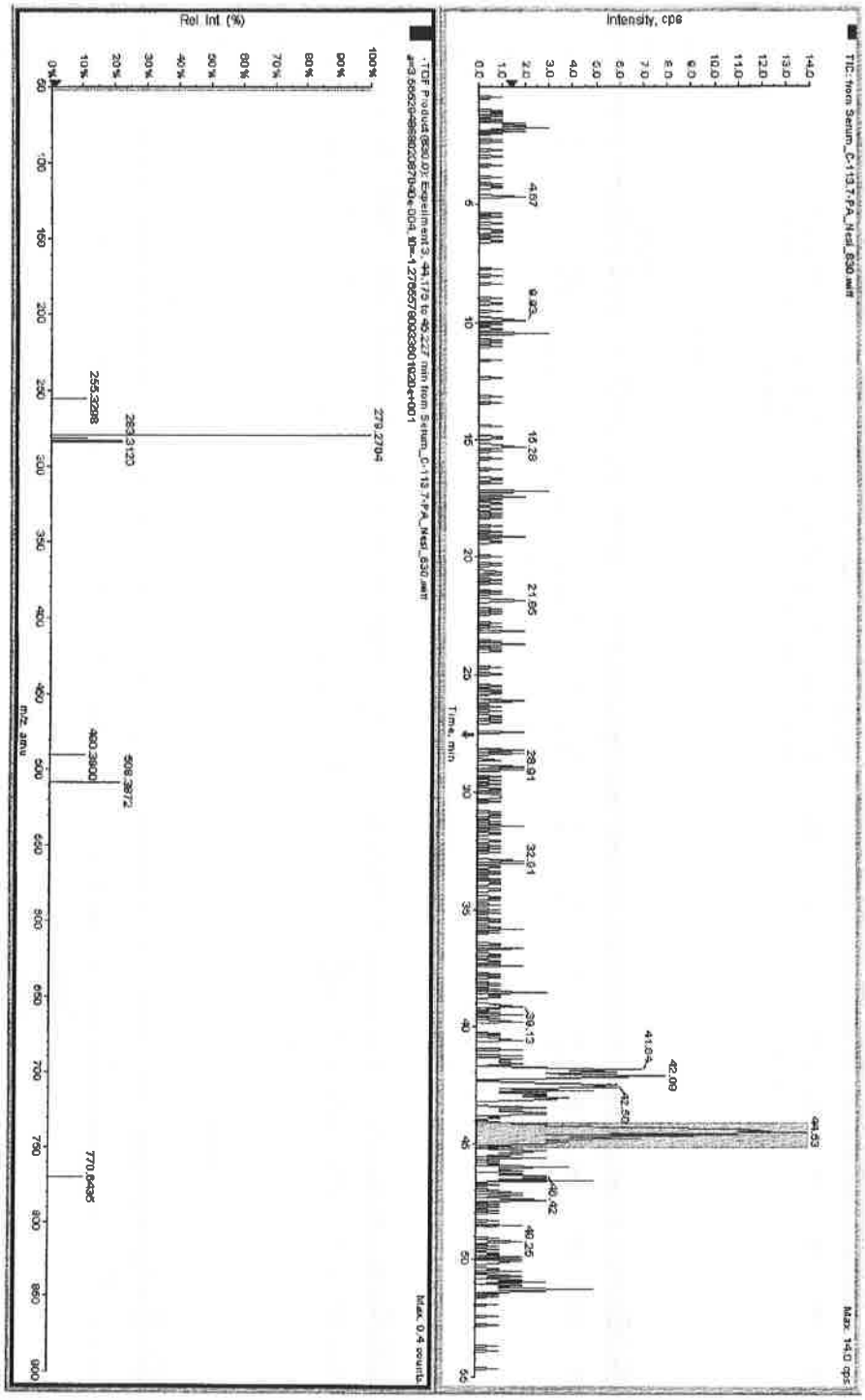

Intensity, cps
Time, min
Rel. Int. (%)
m/z, amu
279.2704
283.3123
254.3288
480.3900
509.3872
770.8435

**Figure 30**

**(b)**

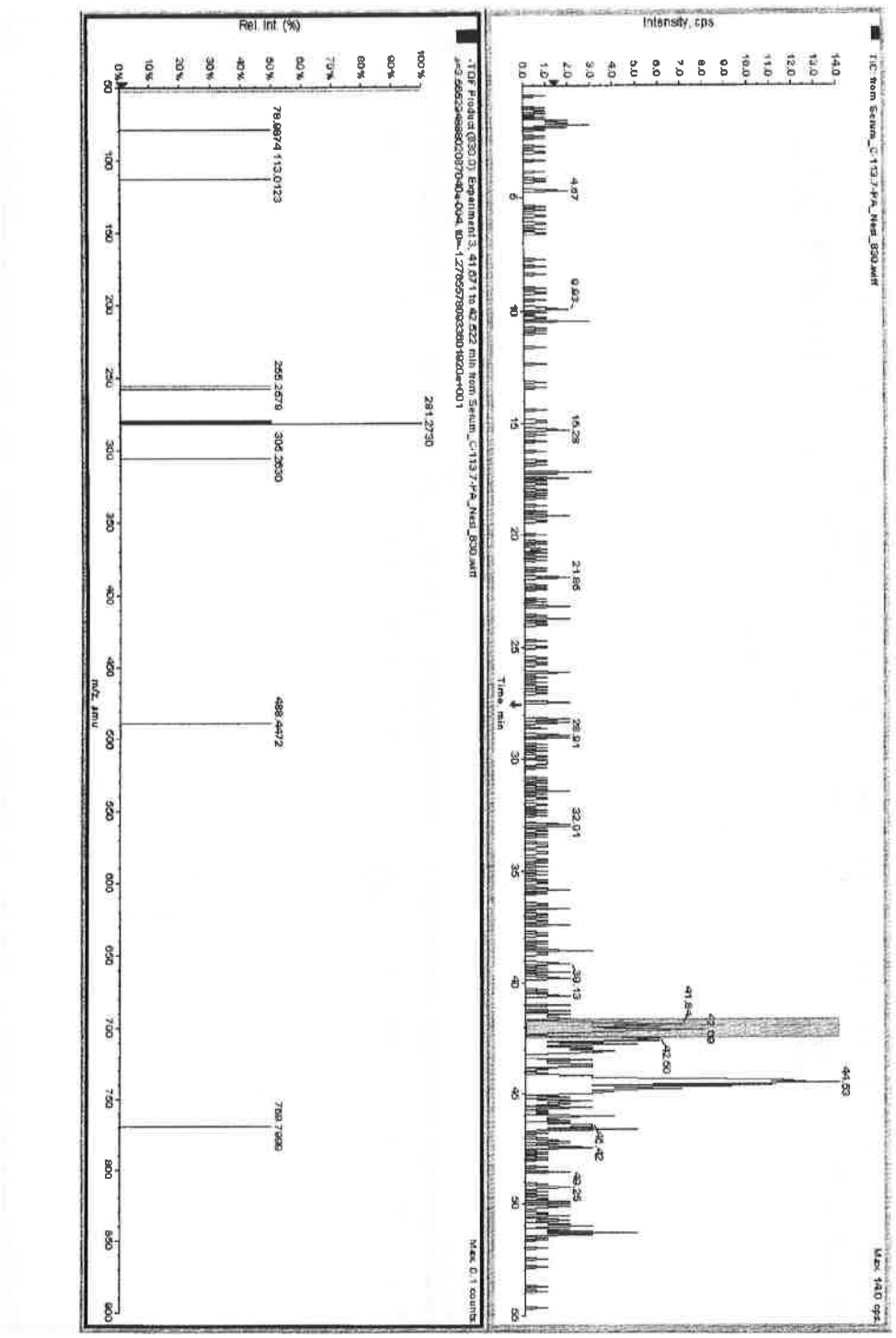



**Figure 30 (cont.)**

**(a)**

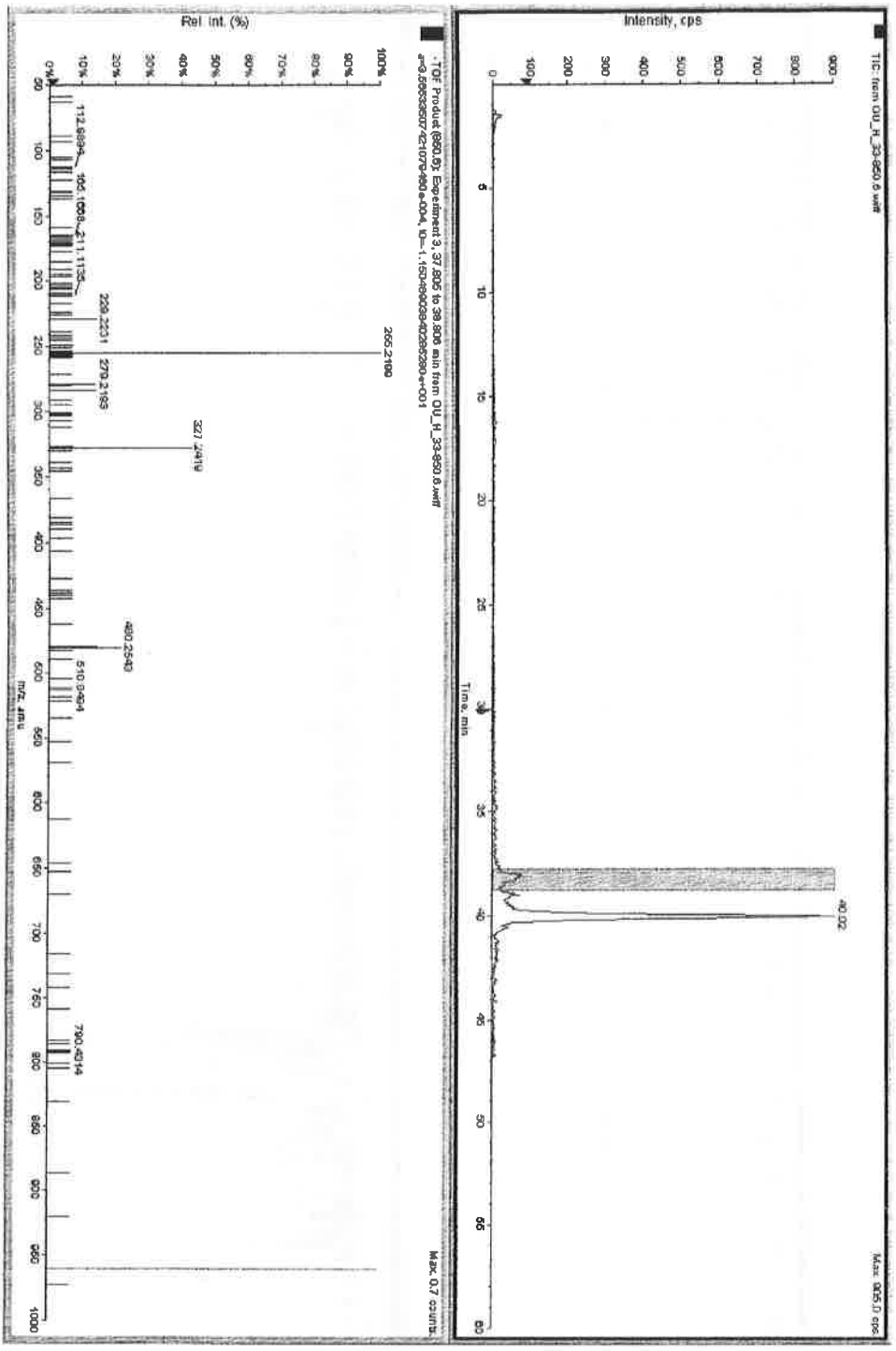

Rel. Int. (%)
Intensity, cps
Time, min
m/z, amu
265.2199
327.2419
480.2540
790.4514
40.02

**Figure 31**

**(b)**

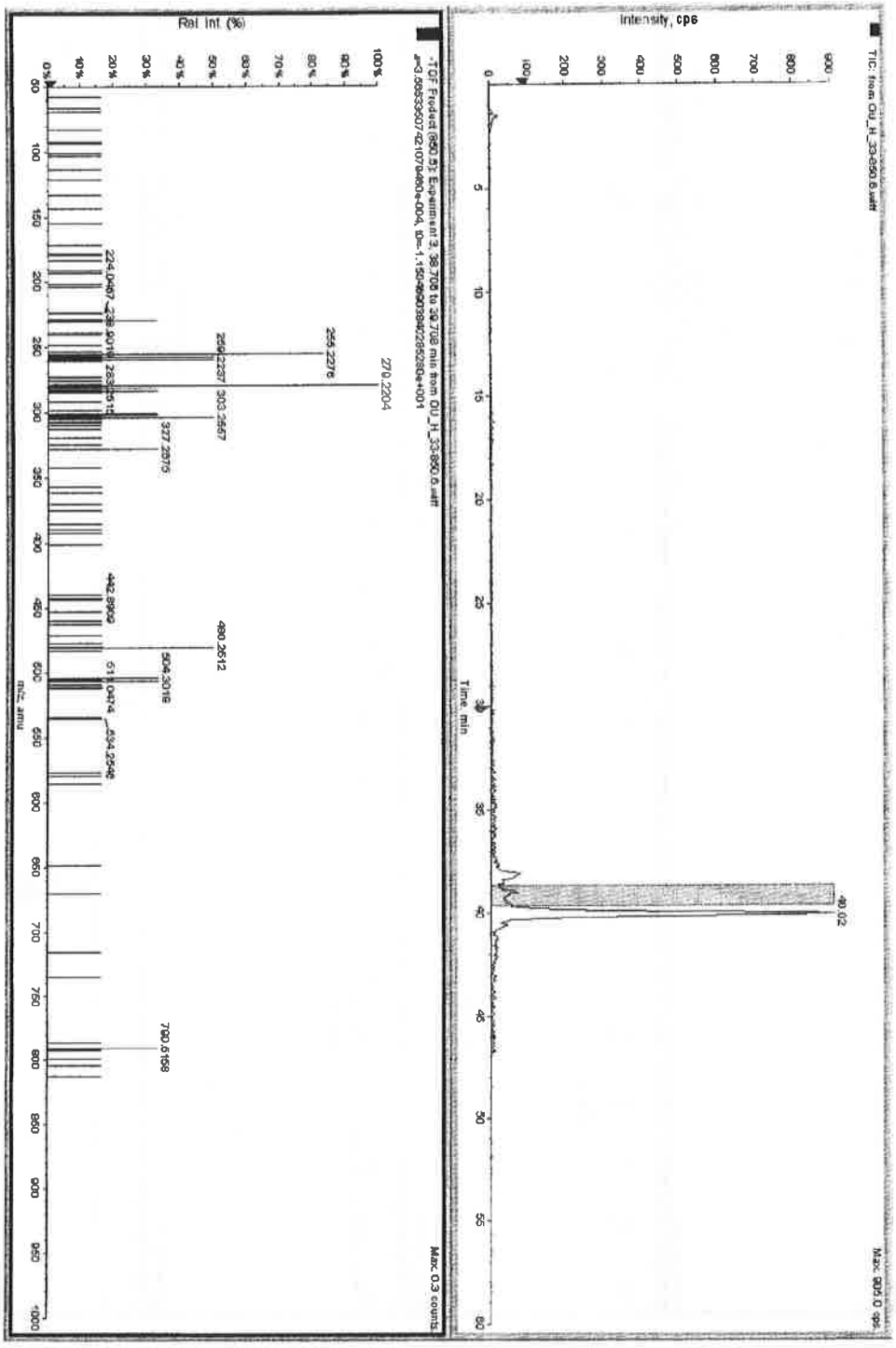



**Figure 31 (cont.)**

**(c)**

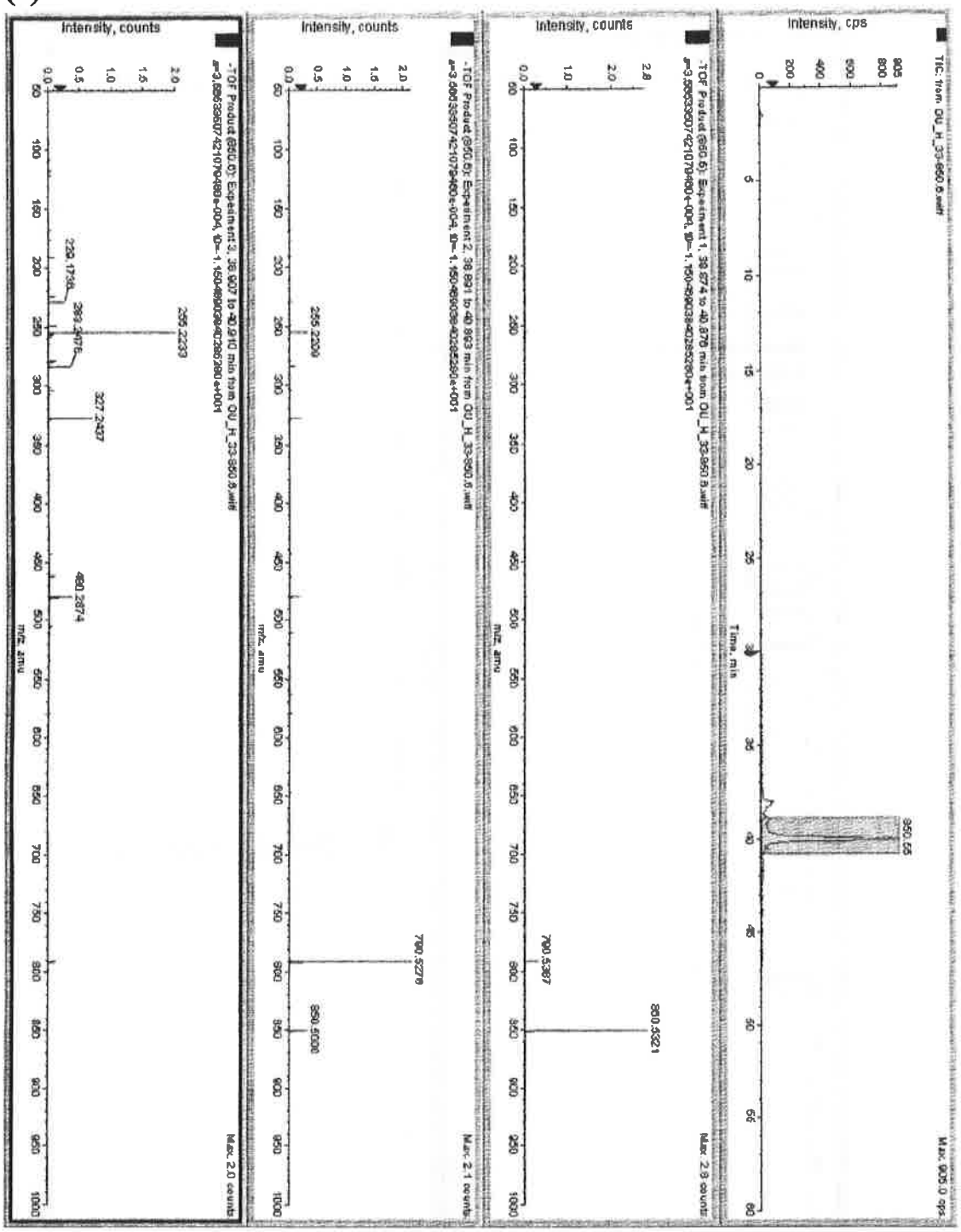



**Figure 31 (cont.)**

**(d)**

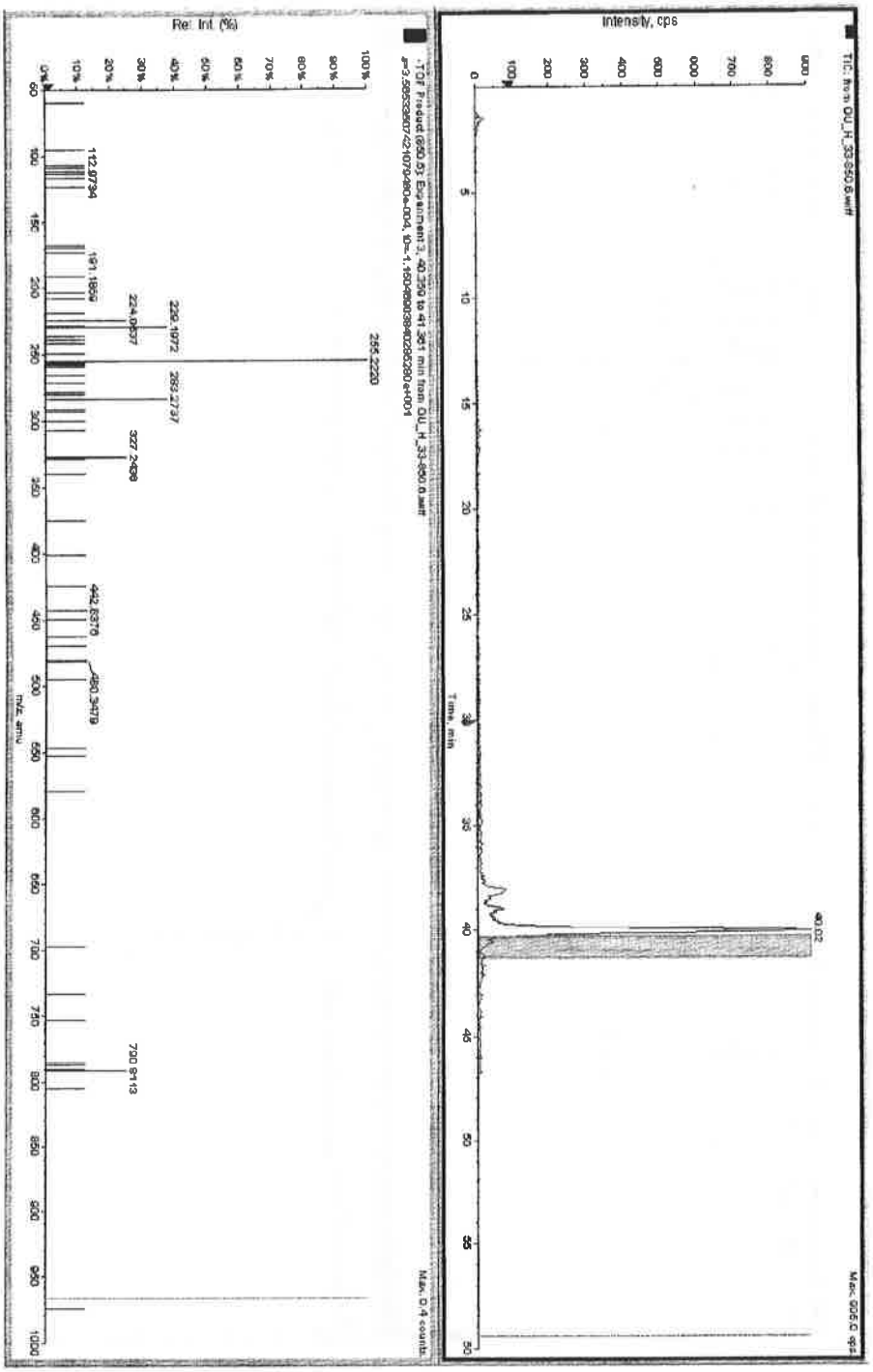



**Figure 31 (cont.)**

**(a)**

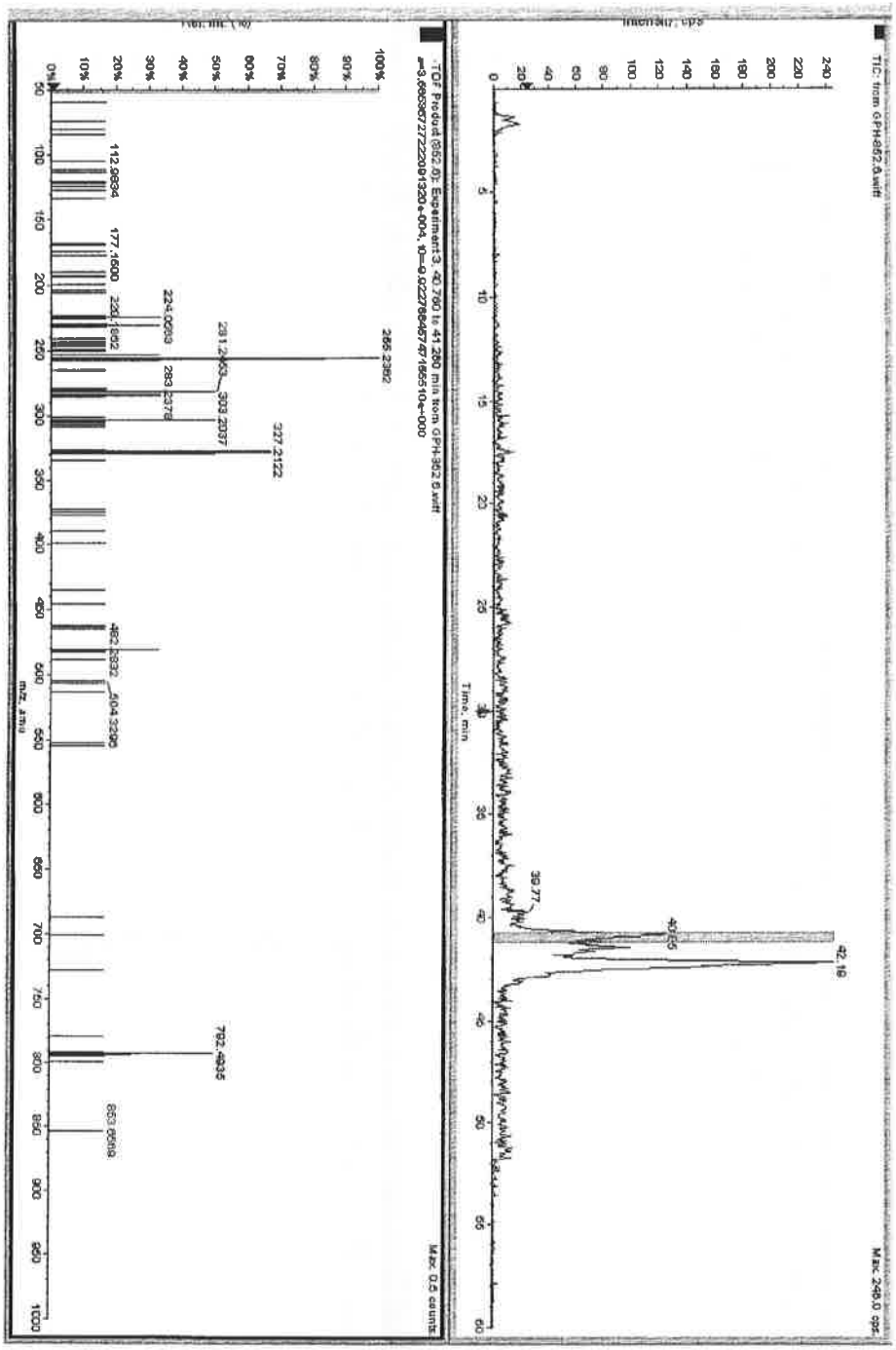

TIC: from GPH-052.0.wiff
Intensity, cps
Time, min
39.77
40.26
42.16
Max: 248.0 cps
TOF Product (652.0): Experiment 3, -42.760 to 41.260 min from GPH-052.0.wiff
Max: 0.5 counts
m/z, amu
112.9834
177.1600
224.0693
265.2362
283.2378
303.2037
327.2122
482.3832
504.3296
792.4935
863.5569

**Figure 32**

**(b)**

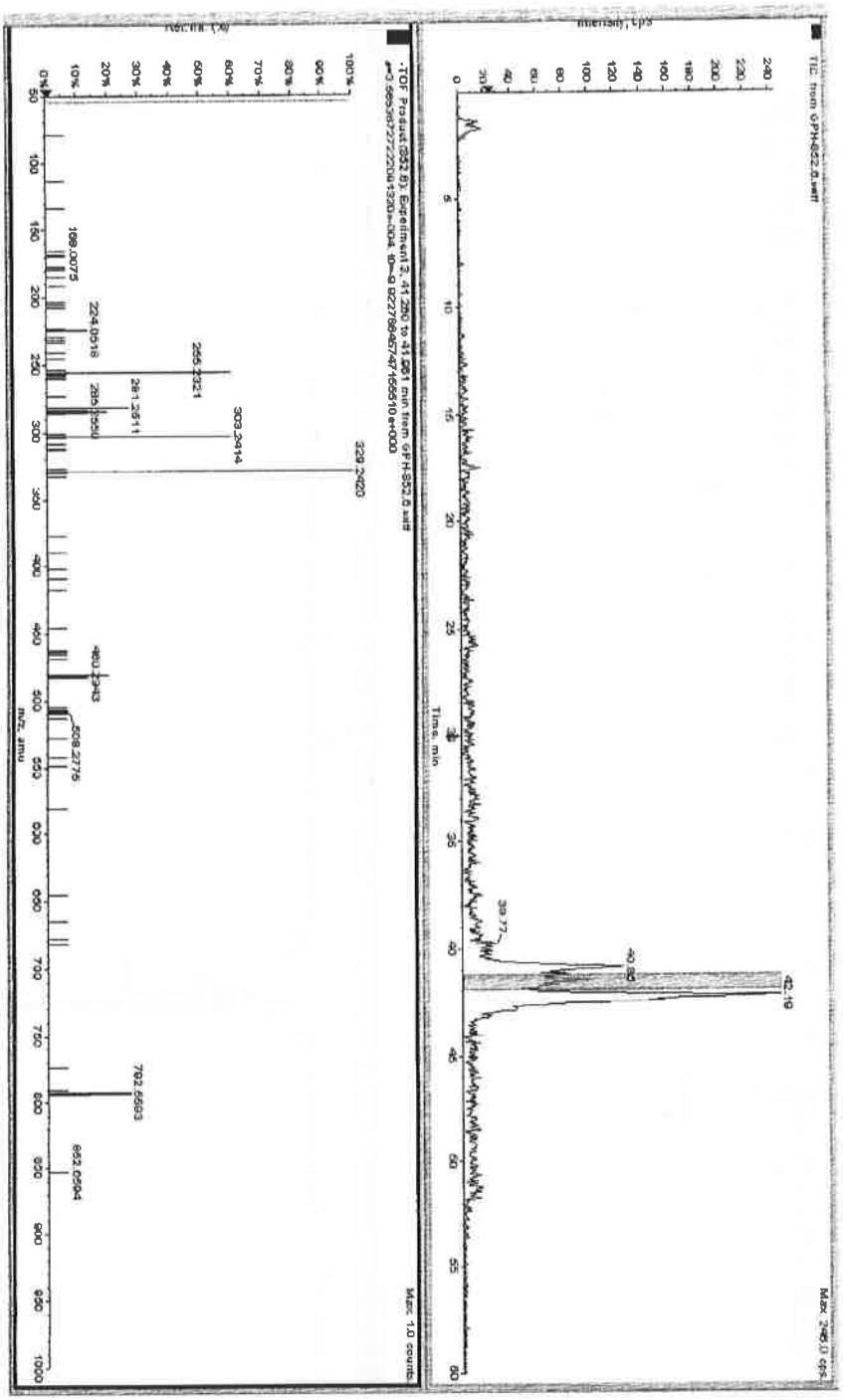



**Figure 32 (cont.)**

**(c)**

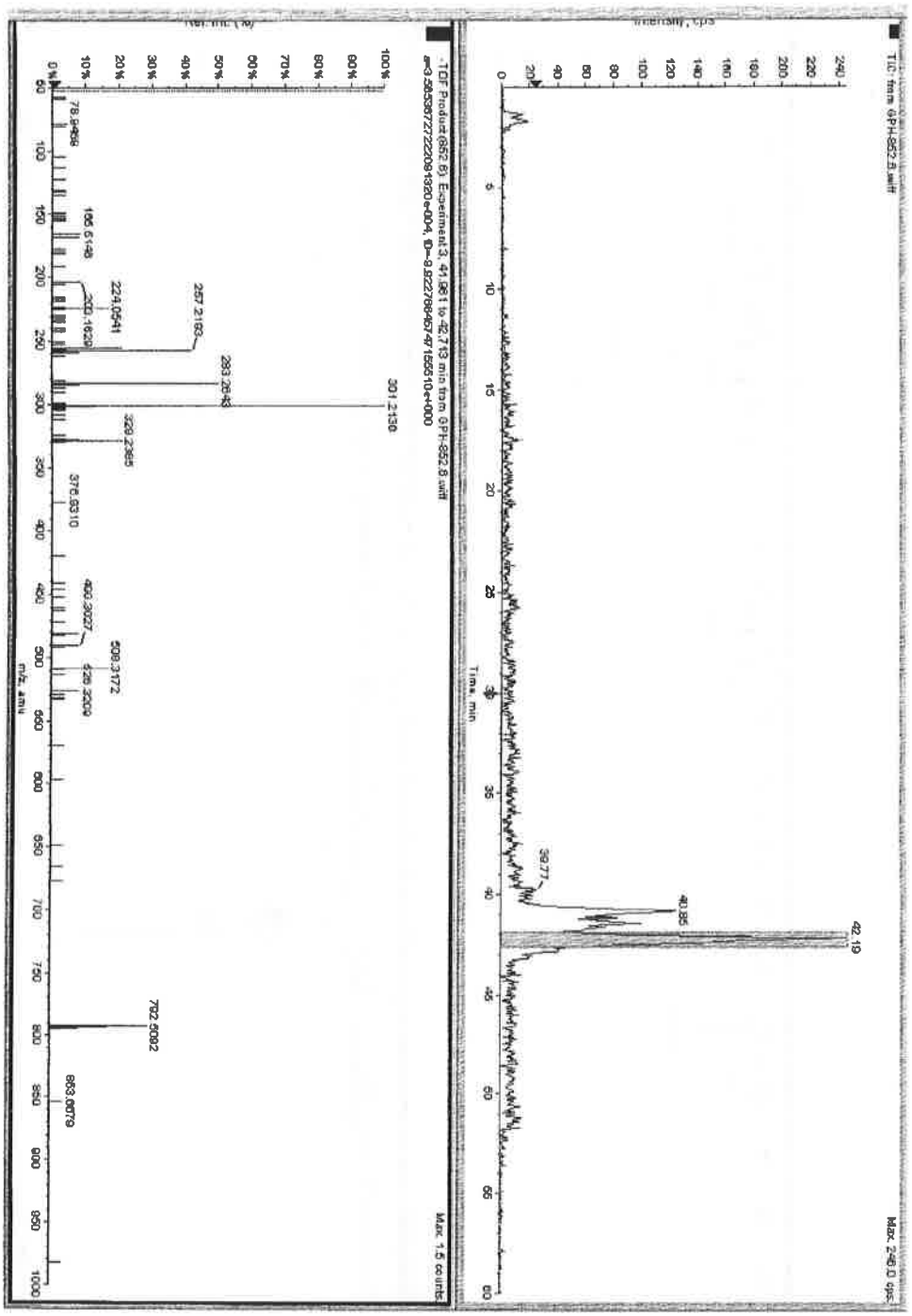



**Figure 32 (cont.)**

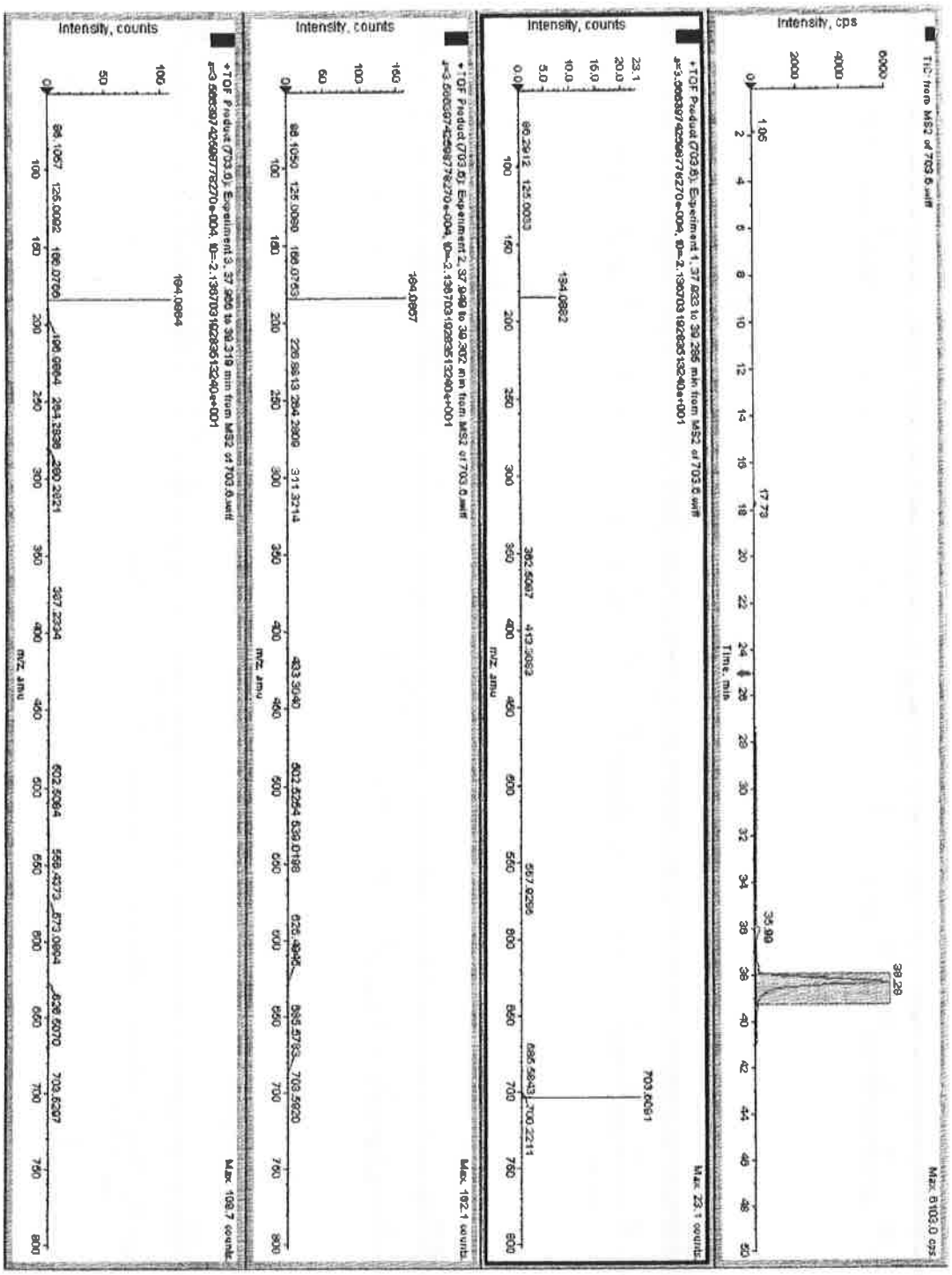

TIC from MS2 of 703.6.wiff
Max. 6103.0 cps.
Intensity, cps
Time, min
35.90
39.29
17.73
1.05
+TOF Product (703.6): Experiment 1, 37.833 to 39.266 min from MS2 of 703.6.wiff
Max. 23.1 counts.
Intensity, counts
m/z, amu
703.6091
194.0882
125.0093
66.2912
+TOF Product (703.6): Experiment 2, 37.949 to 39.302 min from MS2 of 703.6.wiff
Max. 192.1 counts.
194.0857
125.0093
98.1050
166.0763
+TOF Product (703.6): Experiment 3, 37.966 to 39.319 min from MS2 of 703.6.wiff
Max. 199.7 counts.
194.0884
125.0092
98.1057
166.0766

**Figure 33**

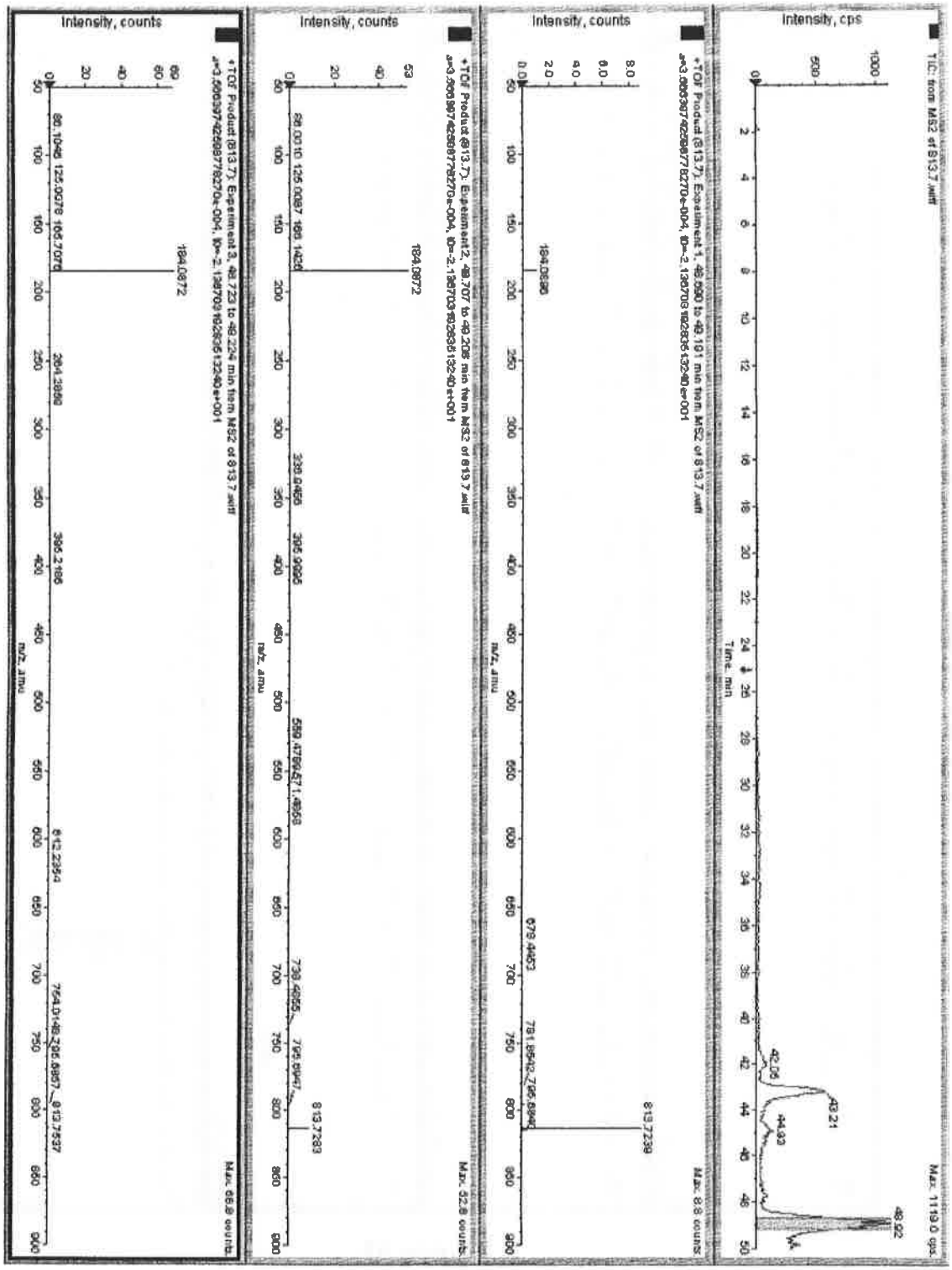

TIC: from MS2 of 813.7.wiff
Max: 11190 cps.
Intensity, cps
Time, min
42.06
43.21
44.93
48.92
+TOF Product (813.7): Experiment 1, 48.560 to 48.191 min from MS2 of 813.7.wiff
Max: 8.8 counts.
Intensity, counts
184.0836
813.7239
679.4463
781.9542
795.6849
+TOF Product (813.7): Experiment 2, 48.707 to 48.208 min from MS2 of 813.7.wiff
Max: 52.8 counts.
Intensity, counts
184.0872
89.0010
125.0087
165.1424
336.0456
395.9995
559.4796
571.4958
739.4955
795.5947
813.7283
m/z, amu
+TOF Product (813.7): Experiment 3, 48.723 to 48.224 min from MS2 of 813.7.wiff
Max: 66.8 counts.
Intensity, counts
184.0872
89.1048
125.0078
165.1070
284.2858
395.2186
612.2354
764.0148
785.6957
813.7537
m/z, amu

**Figure 34**

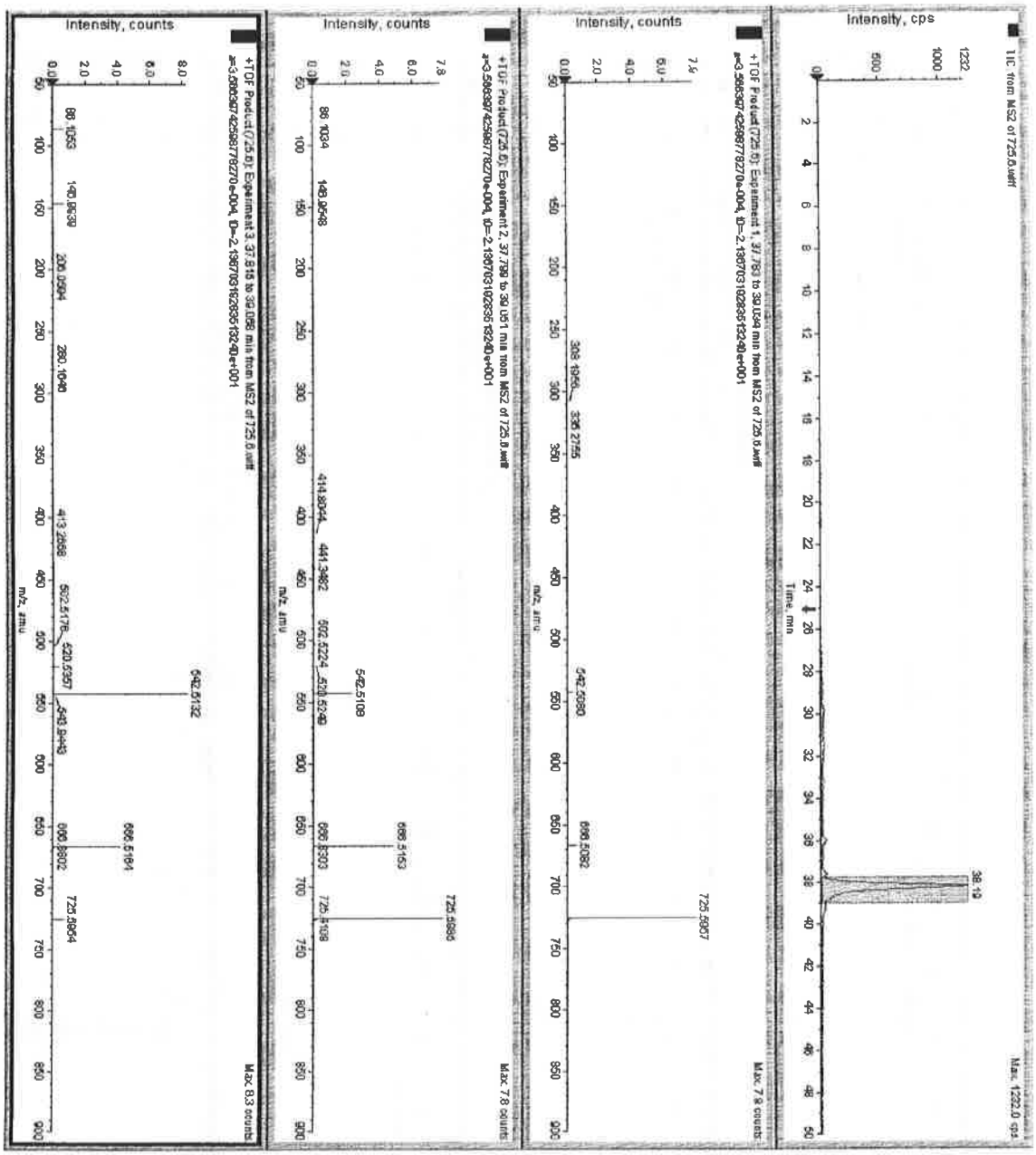

TIC from MS2 of 725.6.wiff
Intensity, cps
Time, min
38.19
Max. 1222.0 cps
+TOF Product (725.6): Experiment 1, 37.783 to 39.034 min from MS2 of 725.6.wiff
Intensity, counts
308.1956
336.2155
542.5080
666.5082
725.5857
Max. 7.8 counts
+TOF Product (725.6): Experiment 2, 37.799 to 39.051 min from MS2 of 725.6.wiff
Intensity, counts
148.9548
414.9044
441.3462
502.5224
520.5248
542.5109
666.5153
725.5886
Max. 7.8 counts
+TOF Product (725.6): Experiment 3, 37.815 to 39.056 min from MS2 of 725.6.wiff
Intensity, counts
86.1053
148.9539
206.0504
280.1046
413.2668
502.5176
520.5357
542.5132
666.5164
725.5854
Max. 8.3 counts
m/z, amu

**Figure 35**

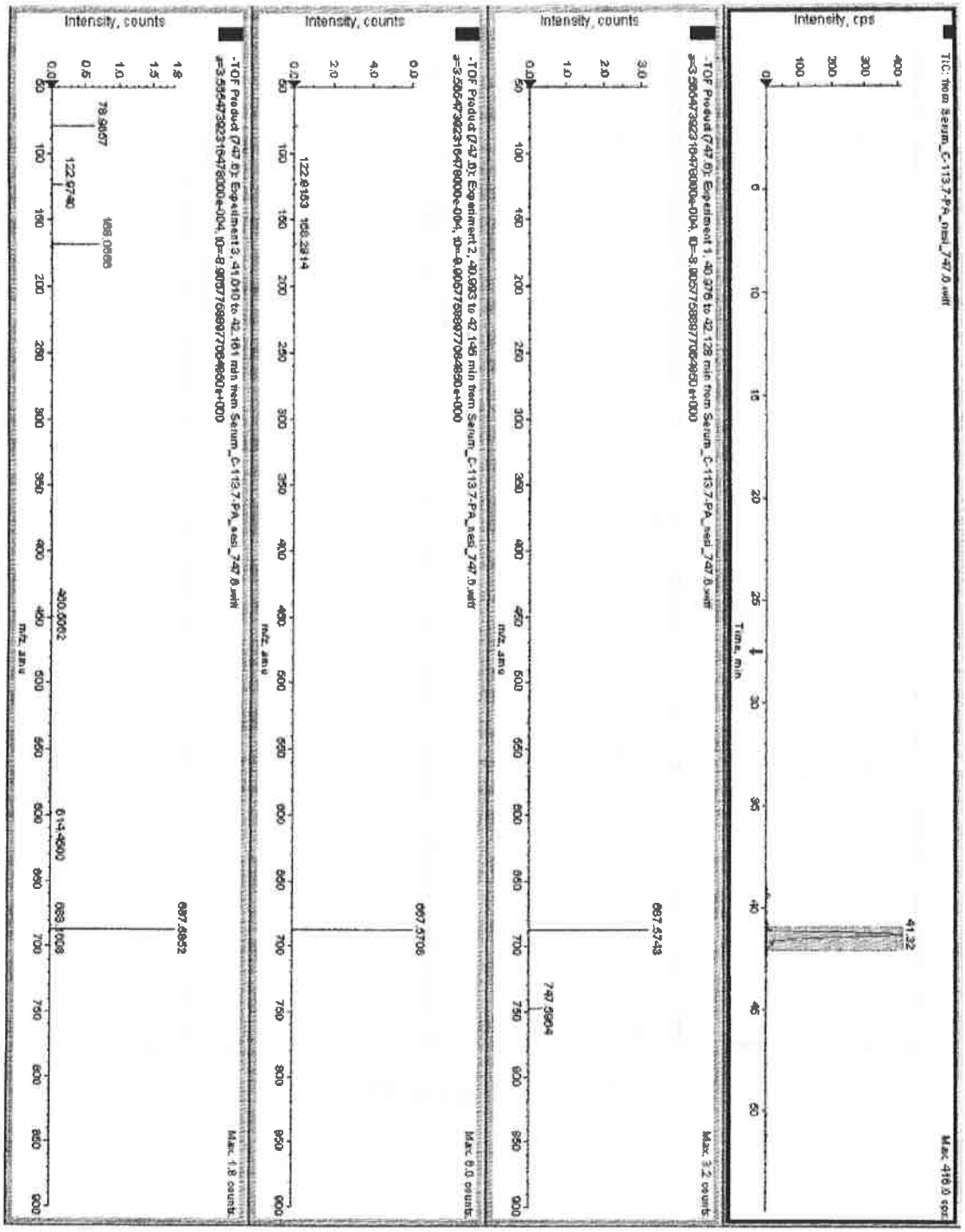

Intensity, cps
Time, min
Intensity, counts
m/z, amu
Intensity, counts
m/z, amu
Intensity, counts
m/z, amu
667.5743
747.5964
667.5706
122.0153
150.2314
687.5652
610.4600
430.5062
78.9657
122.0740
166.0686

**Figure 36**

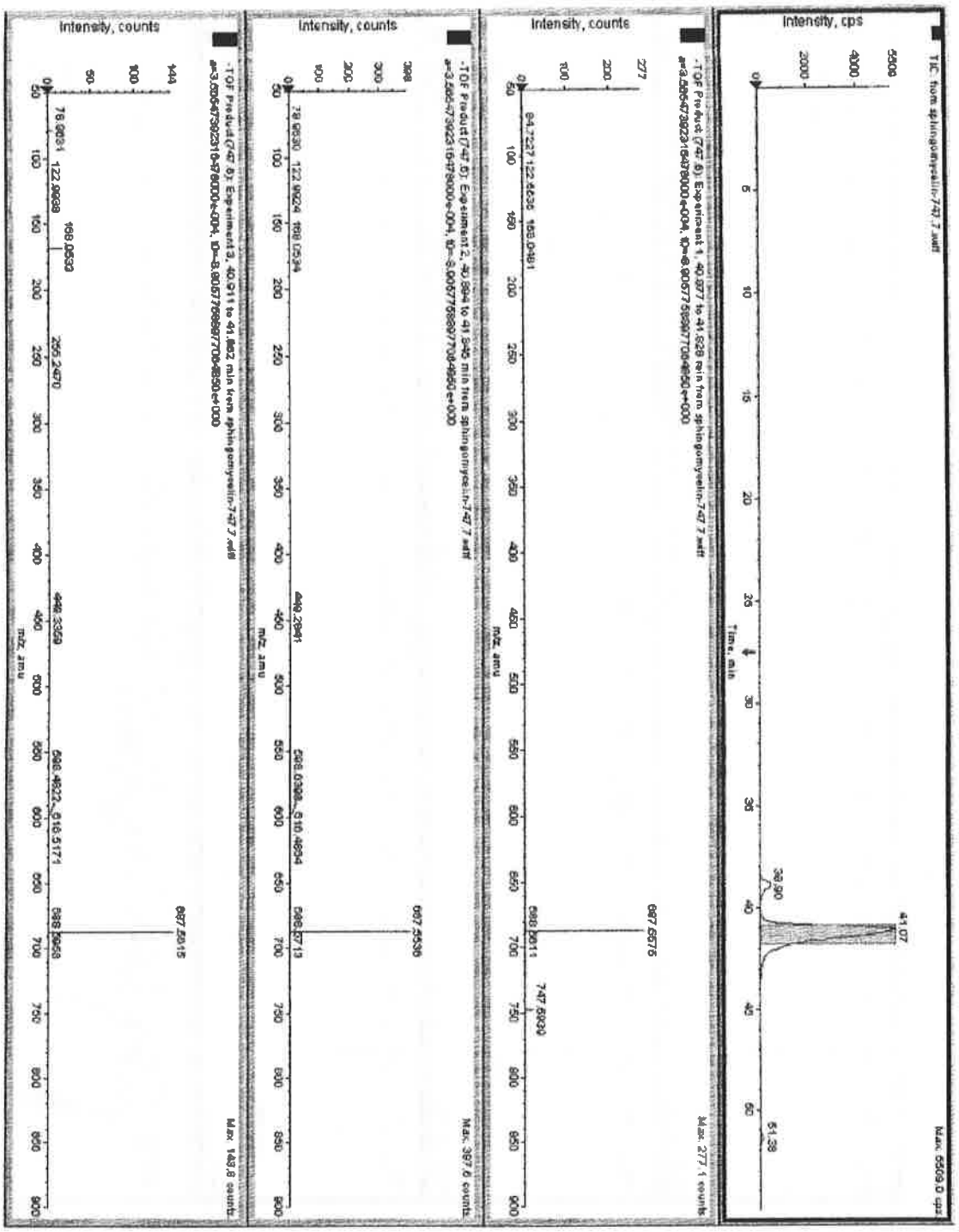

TIC from sphingolipids-747.7.wiff
Max. 5509.0 cps
Intensity, cps
Time, min
41.07
39.90
51.38
-TOF Product (747.6): Experiment 1, 40.977 to 41.628 min from sphingomyelin-747.7.wiff
Max. 277.1 counts
Intensity, counts
m/z, amu
667.5675
747.5939
-TOF Product (747.6): Experiment 2, 40.894 to 41.545 min from sphingomyelin-747.7.wiff
Max. 367.6 counts
667.5536
-TOF Product (747.6): Experiment 3, 40.911 to 41.562 min from sphingomyelin-747.7.wiff
Max. 1437.6 counts
667.5515

**Figure 37**

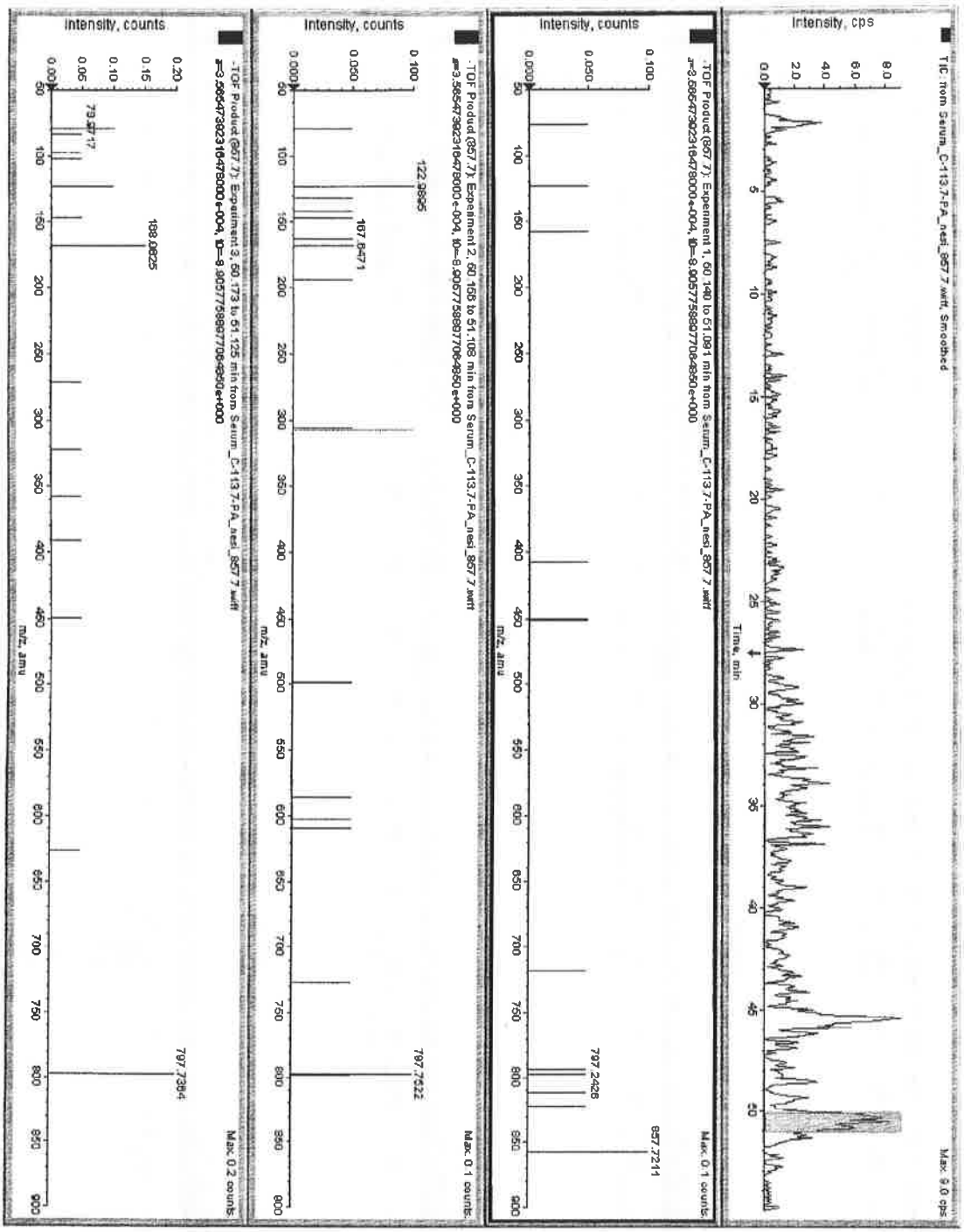

TIC from Serum_C-113.7-PA_nesi_857.7.wiff, Smoothed
Intensity, cps
Time, min
Max. 9.0 cps
-TOF Product (857.7): Experiment 1, 60.140 to 61.091 min from Serum_C-113.7-PA_nesi_857.7.wiff
Intensity, counts
m/z, amu
857.2211
797.2428
Max. 0.1 counts
-TOF Product (857.7): Experiment 2, 60.156 to 61.108 min from Serum_C-113.7-PA_nesi_857.7.wiff
Intensity, counts
m/z, amu
122.9895
167.8471
797.7422
Max. 0.1 counts
-TOF Product (857.7): Experiment 3, 60.173 to 61.125 min from Serum_C-113.7-PA_nesi_857.7.wiff
Intensity, counts
m/z, amu
79.9717
168.0825
797.7384
Max. 0.2 counts

**Figure 38**

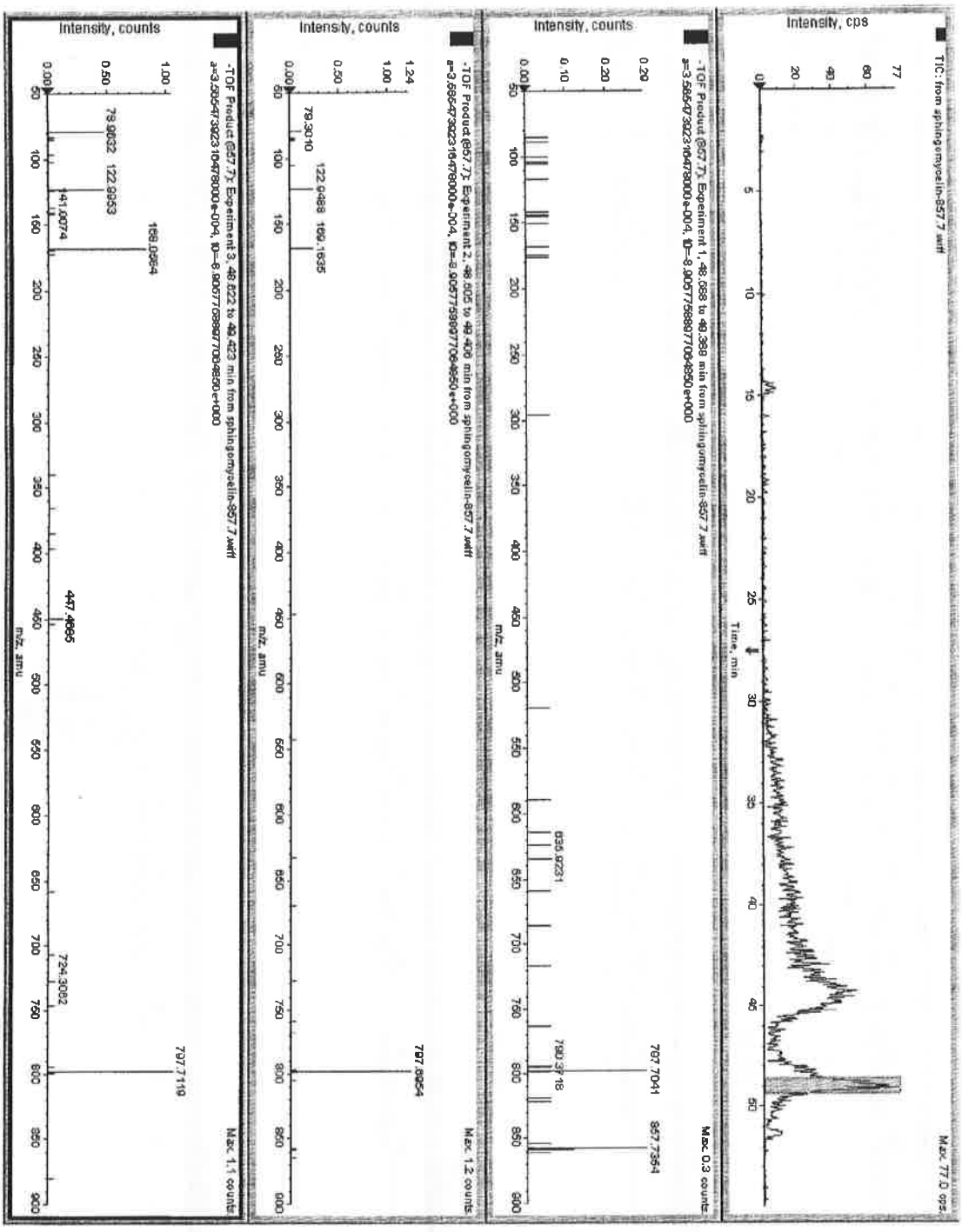

TIC: from sphingomyelin-857.7.wiff
Intensity, cps
Time, min
Max. 77.0 cps
-TOF Product (857.7): Experiment 1, 48.658 to 49.368 min from sphingomyelin-857.7.wiff
Intensity, counts
m/z, amu
Max. 0.3 counts
797.7041
857.7354
-TOF Product (857.7): Experiment 2, 48.605 to 49.406 min from sphingomyelin-857.7.wiff
Intensity, counts
m/z, amu
Max. 1.2 counts
797.8054
-TOF Product (857.7): Experiment 3, 48.622 to 49.423 min from sphingomyelin-857.7.wiff
Intensity, counts
m/z, amu
Max. 1.1 counts
797.7119

**Figure 39**

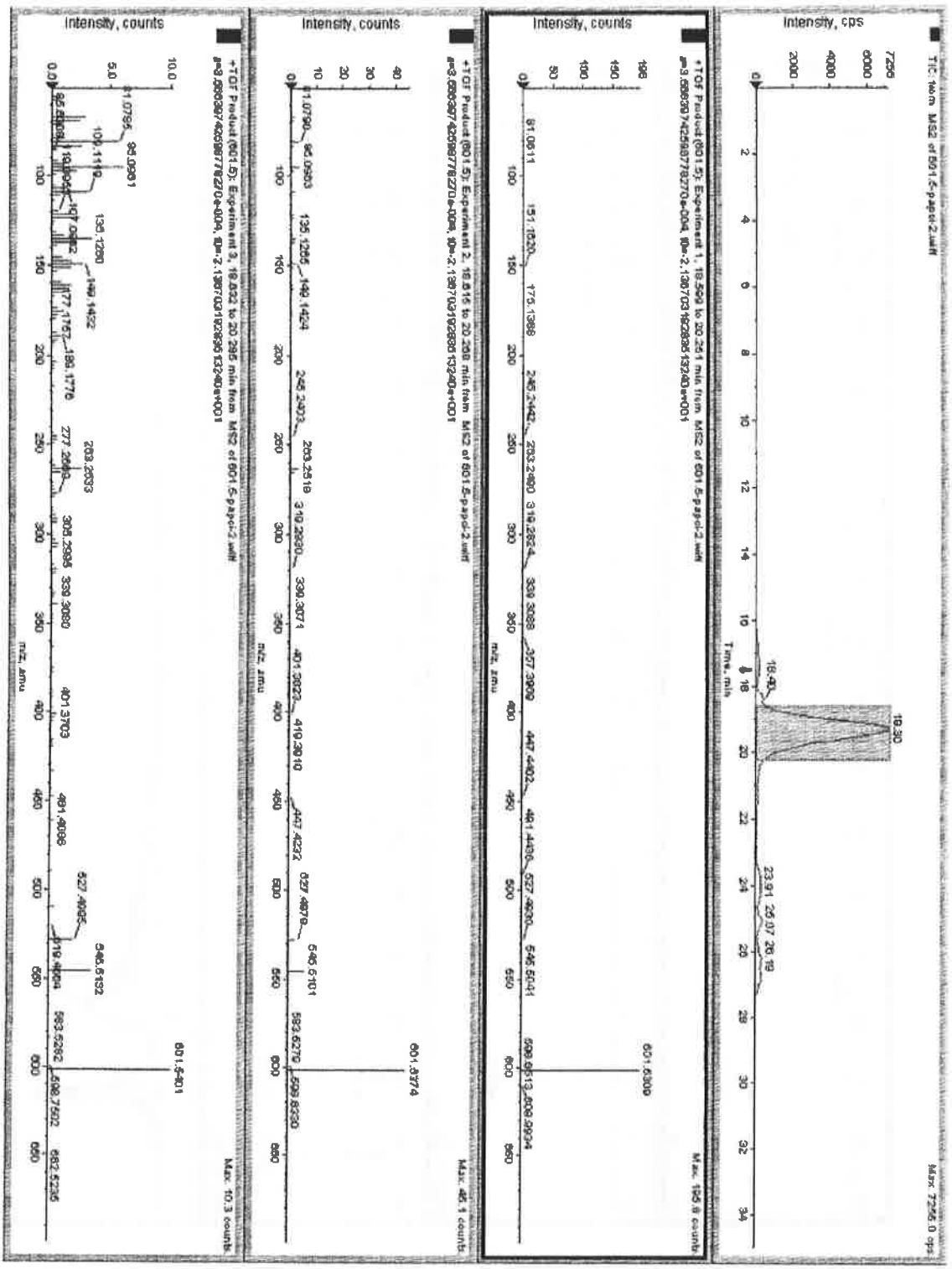
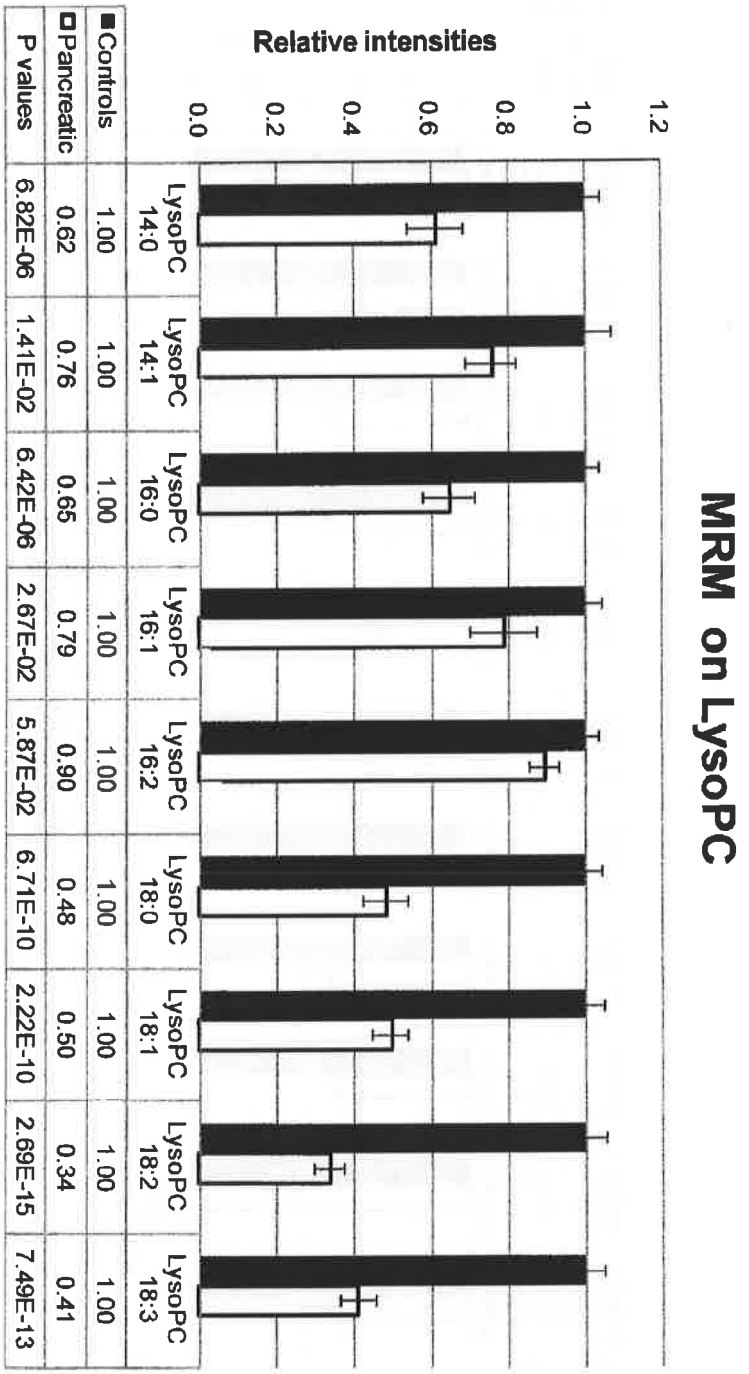

TIC 1min MS2 of 601.5-papol-2.wiff
Intensity, cps
Time, min
Max. 7246.0 cps
+TOF Product (601.5): Experiment 1, 18.569 to 20.251 min from MS2 of 601.5-papol-2.wiff
Intensity, counts
m/z, amu
Max. 125.8 counts
+TOF Product (601.5): Experiment 2, 18.516 to 20.268 min from MS2 of 601.5-papol-2.wiff
Max. 46.1 counts
+TOF Product (601.5): Experiment 3, 18.532 to 20.285 min from MS2 of 601.5-papol-2.wiff
Max. 10.3 counts

**Figure 40**

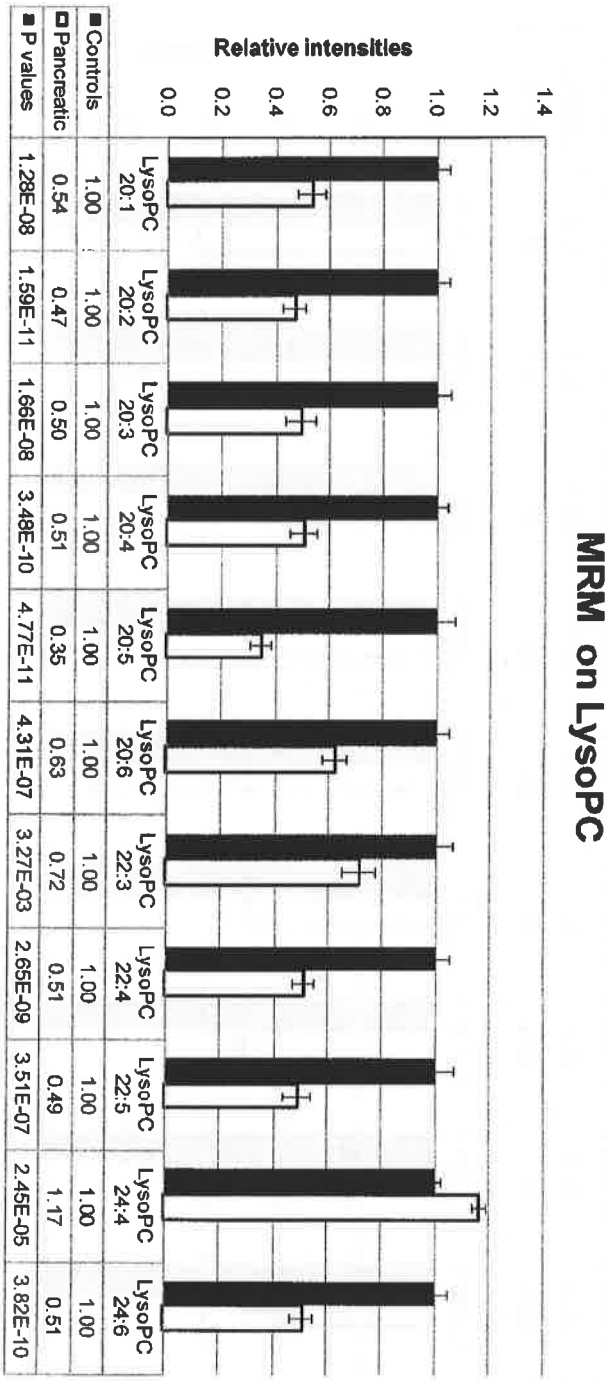
**(a)**




| | LysoPC 14:0 | LysoPC 14:1 | LysoPC 16:0 | LysoPC 16:1 | LysoPC 16:2 | LysoPC 18:0 | LysoPC 18:1 | LysoPC 18:2 | LysoPC 18:3 |
|---|---|---|---|---|---|---|---|---|---|
| ■Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □Pancreatic | 0.62 | 0.76 | 0.65 | 0.79 | 0.90 | 0.48 | 0.50 | 0.34 | 0.41 |
| P values | 6.82E-06 | 1.41E-02 | 6.42E-06 | 2.67E-02 | 5.87E-02 | 6.71E-10 | 2.22E-10 | 2.69E-15 | 7.49E-13 |

**Figure 41**

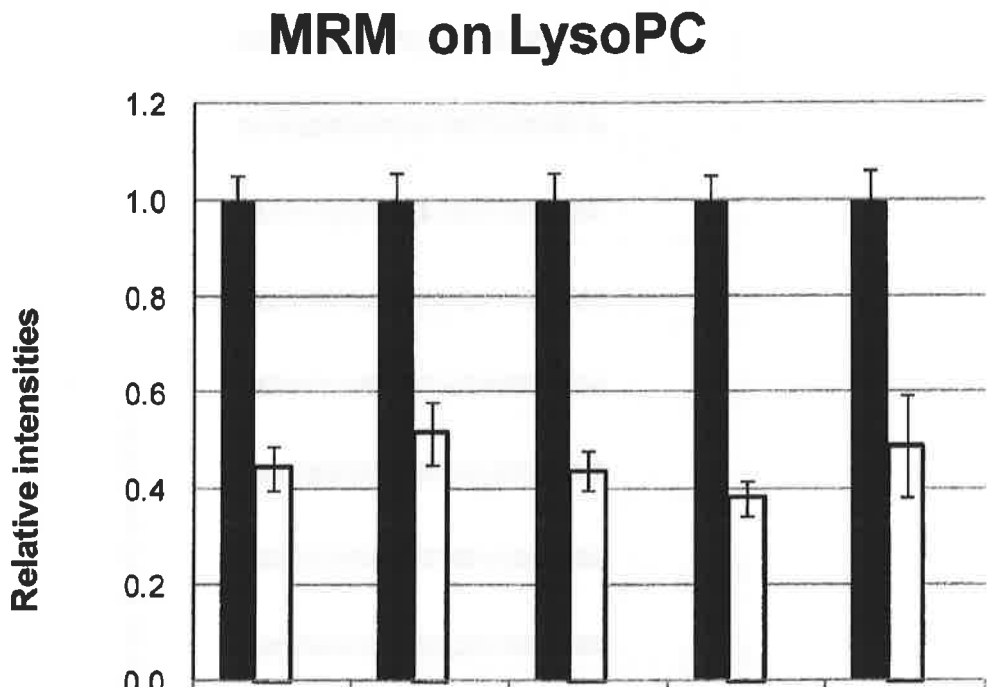
**(b)**




| | LysoPC 20:1 | LysoPC 20:2 | LysoPC 20:3 | LysoPC 20:4 | LysoPC 20:5 | LysoPC 20:6 | LysoPC 22:3 | LysoPC 22:4 | LysoPC 22:5 | LysoPC 24:4 | LysoPC 24:6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic | 0.54 | 0.47 | 0.50 | 0.51 | 0.35 | 0.63 | 0.72 | 0.51 | 0.49 | 1.17 | 0.51 |
| ■ P values | 1.28E-08 | 1.59E-11 | 1.66E-08 | 3.48E-10 | 4.77E-11 | 4.31E-07 | 3.27E-03 | 2.65E-09 | 3.51E-07 | 2.45E-05 | 3.82E-10 |

**Figure 41 (Cont.)**

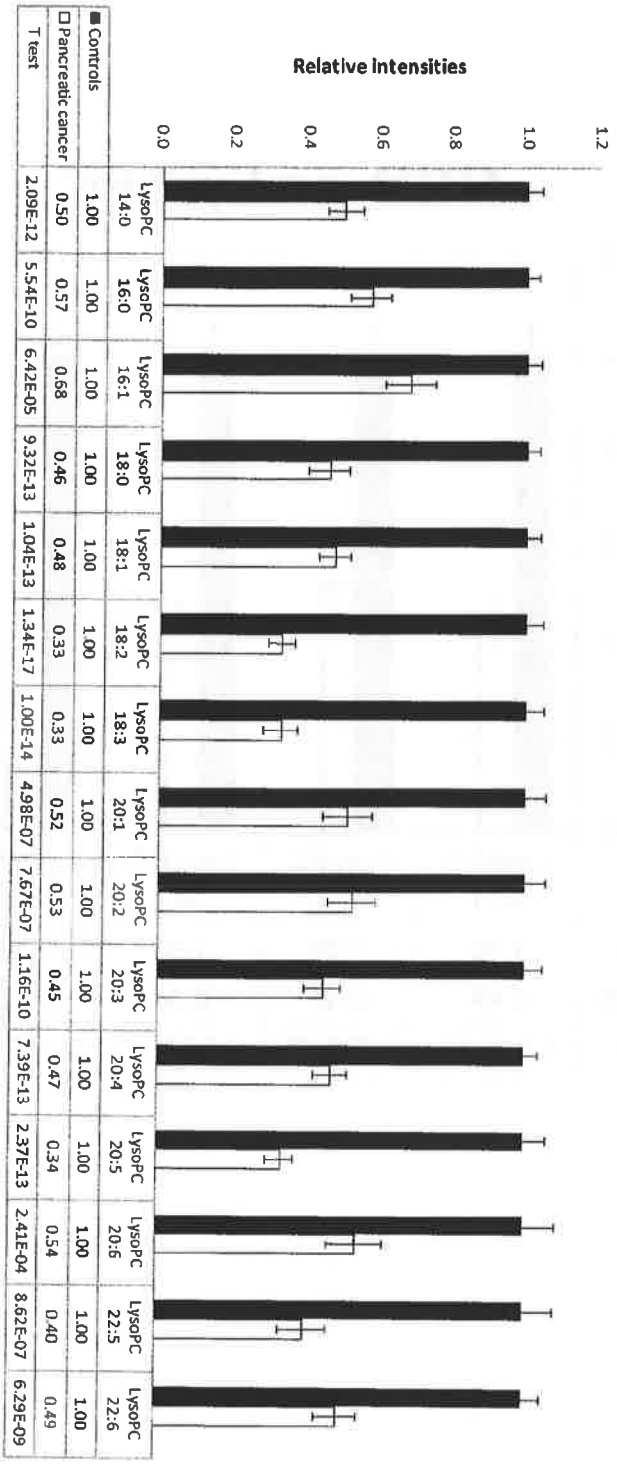
(c)




| | LysoPC 30:1 | LysoPC 32:0 | LysoPC 32:1 | LysoPC 32:2 | LysoPC 32:6 |
|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic | 0.44 | 0.52 | 0.44 | 0.38 | 0.49 |
| ■ P values | 3.94E-12 | 1.72E-07 | 1.03E-11 | 2.81E-14 | 3.19E-05 |

**Figure 41 (Cont.)**

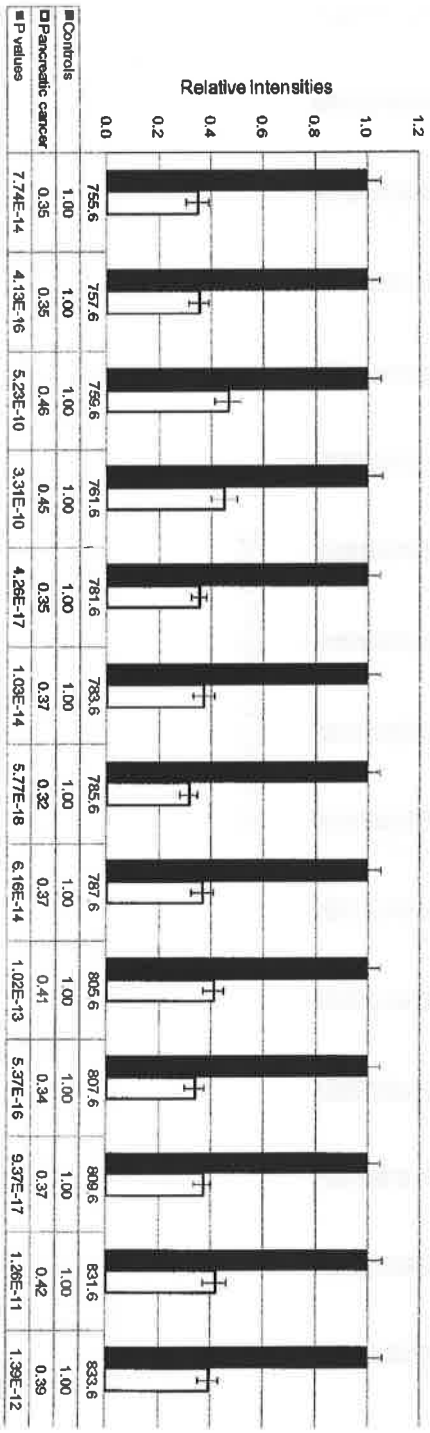
**(d)**




| | LysoPC 14:0 | LysoPC 16:0 | LysoPC 16:1 | LysoPC 18:0 | LysoPC 18:1 | LysoPC 18:2 | LysoPC 18:3 | LysoPC 20:1 | LysoPC 20:2 | LysoPC 20:3 | LysoPC 20:4 | LysoPC 20:5 | LysoPC 20:6 | LysoPC 22:5 | LysoPC 22:6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic cancer | 0.50 | 0.57 | 0.68 | 0.46 | 0.48 | 0.33 | 0.33 | 0.52 | 0.53 | 0.45 | 0.47 | 0.34 | 0.54 | 0.40 | 0.49 |
| T test | 2.09E-12 | 5.54E-10 | 6.42E-05 | 9.32E-13 | 1.04E-13 | 1.34E-17 | 1.00E-14 | 4.98E-07 | 7.67E-07 | 1.16E-10 | 7.39E-13 | 2.37E-13 | 2.41E-04 | 8.62E-07 | 6.29E-09 |

**Figure 41 (Cont.)**

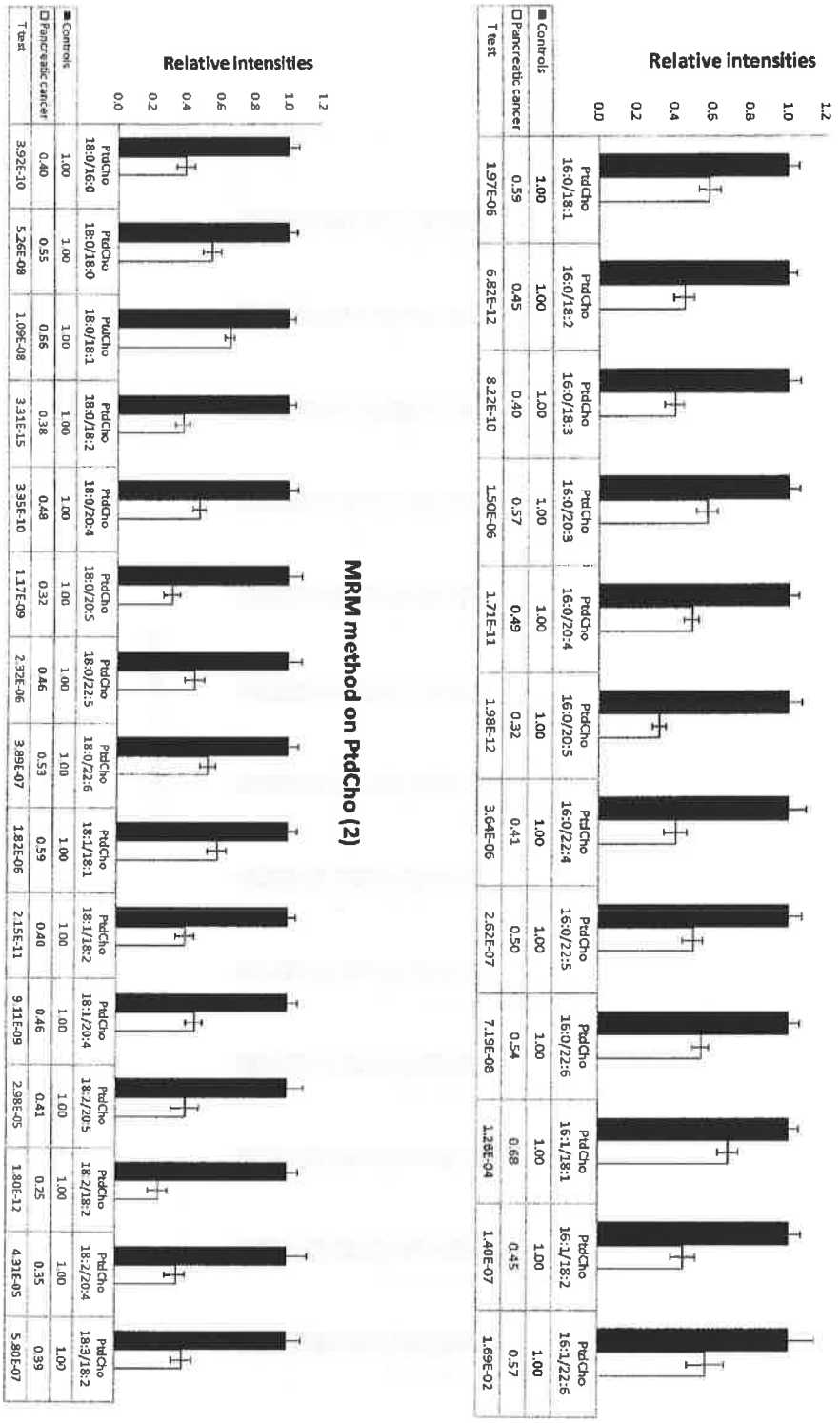
**a)**




| | 755.6 | 757.6 | 759.6 | 761.6 | 781.6 | 783.6 | 785.6 | 787.6 | 805.6 | 807.6 | 809.6 | 831.6 | 833.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □Pancreatic cancer | 0.35 | 0.35 | 0.46 | 0.45 | 0.35 | 0.37 | 0.32 | 0.37 | 0.41 | 0.34 | 0.37 | 0.42 | 0.39 |
| ■P values | 7.74E-14 | 4.13E-16 | 5.23E-10 | 3.31E-10 | 4.26E-17 | 1.03E-14 | 5.77E-18 | 6.16E-14 | 1.02E-13 | 5.37E-16 | 9.37E-17 | 1.26E-11 | 1.39E-12 |

**Figure 42**

b)

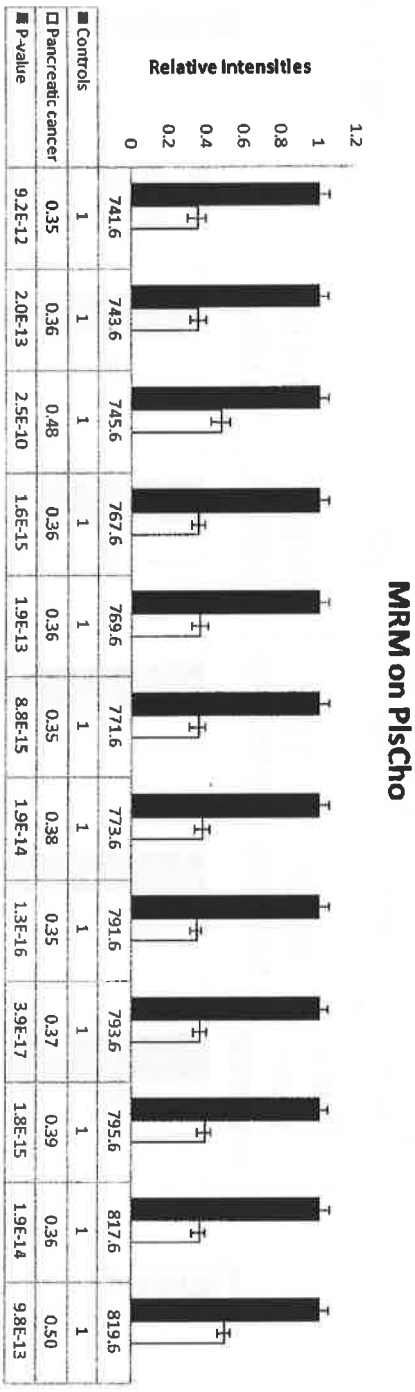



| | PtdCho 16:0/18:1 | PtdCho 16:0/18:2 | PtdCho 16:0/18:3 | PtdCho 16:0/20:3 | PtdCho 16:0/20:4 | PtdCho 16:0/20:5 | PtdCho 16:0/22:4 | PtdCho 16:0/22:5 | PtdCho 16:0/22:6 | PtdCho 16:1/18:1 | PtdCho 16:1/18:2 | PtdCho 16:1/22:6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic cancer | 0.59 | 0.45 | 0.40 | 0.57 | 0.49 | 0.32 | 0.41 | 0.50 | 0.54 | 0.68 | 0.45 | 0.57 |
| T test | 1.97E-06 | 6.82E-12 | 8.22E-10 | 1.50E-06 | 1.71E-11 | 1.98E-12 | 3.64E-06 | 2.62E-07 | 7.19E-08 | 1.29E-04 | 1.40E-07 | 1.69E-02 |

| | PtdCho 18:0/16:0 | PtdCho 18:0/18:0 | PtdCho 18:0/18:1 | PtdCho 18:0/18:2 | PtdCho 18:0/20:4 | PtdCho 18:0/20:5 | PtdCho 18:0/22:5 | PtdCho 18:0/22:6 | PtdCho 18:1/18:1 | PtdCho 18:1/18:2 | PtdCho 18:1/20:4 | PtdCho 18:2/20:5 | PtdCho 18:2/18:2 | PtdCho 18:2/20:4 | PtdCho 18:3/18:2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic cancer | 0.40 | 0.55 | 0.66 | 0.38 | 0.48 | 0.32 | 0.46 | 0.53 | 0.59 | 0.40 | 0.46 | 0.41 | 0.25 | 0.35 | 0.99 |
| T test | 3.92E-10 | 5.26E-08 | 1.09E-08 | 3.31E-15 | 3.35E-10 | 1.17E-09 | 2.32E-06 | 3.89E-07 | 1.82E-06 | 2.15E-11 | 9.11E-09 | 2.98E-05 | 1.80E-12 | 4.31E-05 | 5.80E-07 |

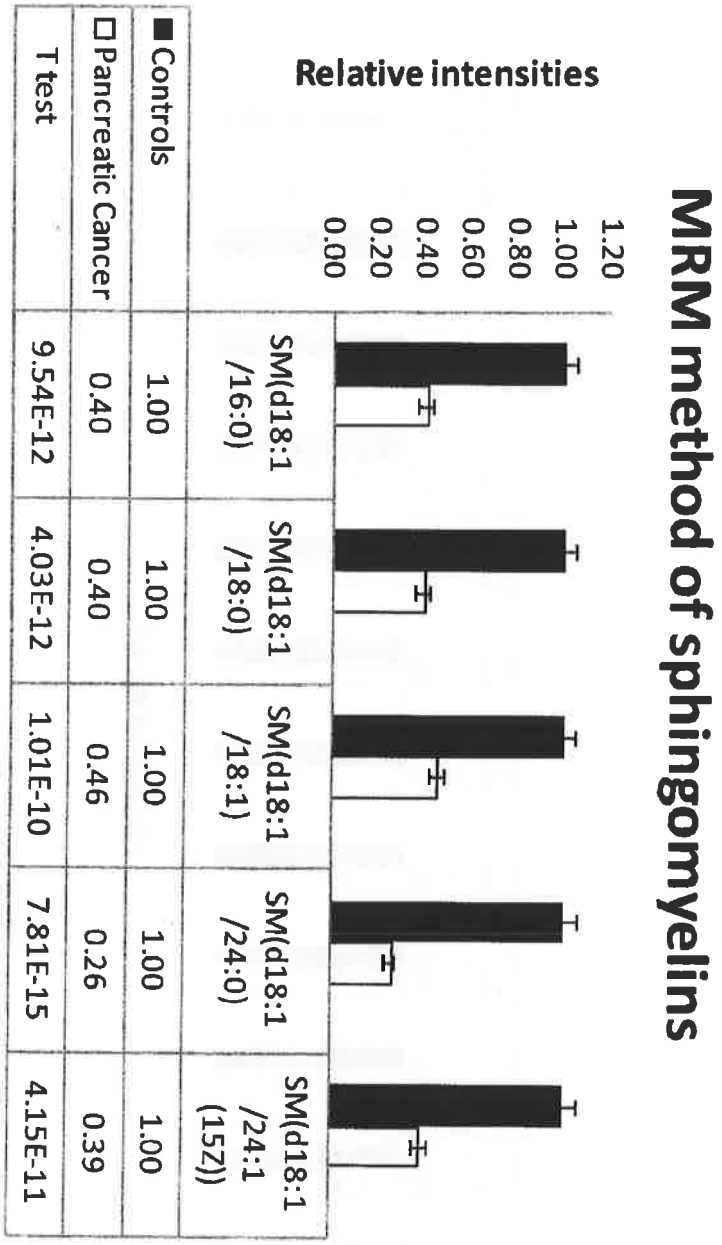
**Figure 42 (cont.)**

c)



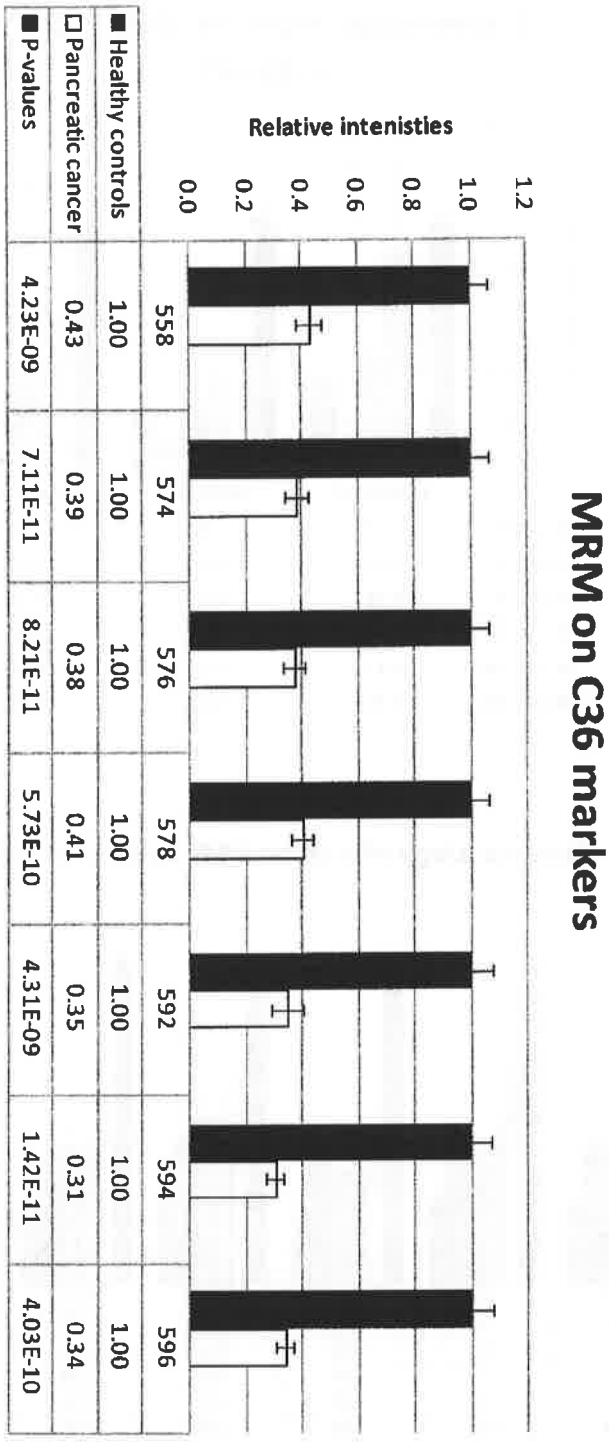

| | 741.6 | 743.6 | 745.6 | 767.6 | 769.6 | 771.6 | 773.6 | 791.6 | 793.6 | 795.6 | 817.6 | 819.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ■ Controls | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| □ Pancreatic cancer | 0.35 | 0.36 | 0.48 | 0.36 | 0.36 | 0.35 | 0.38 | 0.35 | 0.37 | 0.39 | 0.36 | 0.50 |
| ■ P-value | 9.2E-12 | 2.0E-13 | 2.5E-10 | 1.6E-15 | 1.9E-13 | 8.8E-15 | 1.9E-14 | 1.3E-16 | 3.9E-17 | 1.8E-15 | 1.9E-14 | 9.8E-13 |

**Figure 42 (Cont.)**




| | SM(d18:1/16:0) | SM(d18:1/18:0) | SM(d18:1/18:1) | SM(d18:1/24:0) | SM(d18:1/24:1(15Z)) |
|---|---|---|---|---|---|
| ■ Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic Cancer | 0.40 | 0.40 | 0.46 | 0.26 | 0.39 |
| T test | 9.54E-12 | 4.03E-12 | 1.01E-10 | 7.81E-15 | 4.15E-11 |

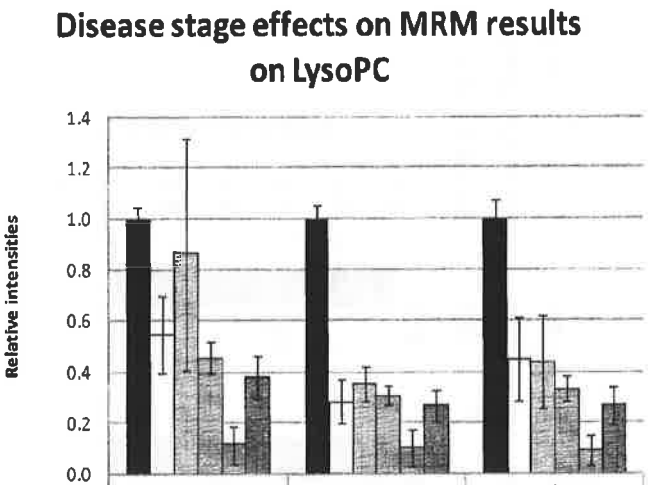
**Figure 43**




| | 558 | 574 | 576 | 578 | 592 | 594 | 596 |
|---|---|---|---|---|---|---|---|
| ■ Healthy controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| □ Pancreatic cancer | 0.43 | 0.39 | 0.38 | 0.41 | 0.35 | 0.31 | 0.34 |
| ■ P-values | 4.23E-09 | 7.11E-11 | 8.21E-11 | 5.73E-10 | 4.31E-09 | 1.42E-11 | 4.03E-10 |

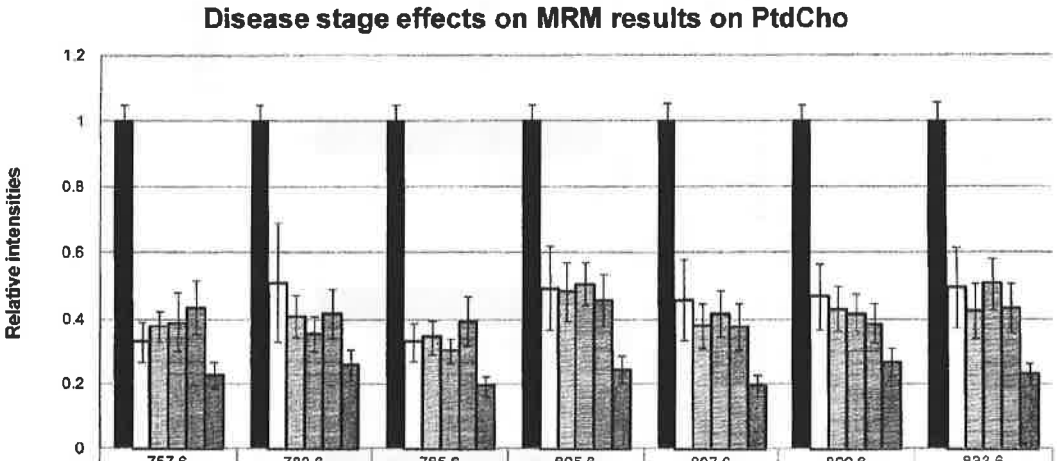
**Figure 44**

**(a)**




| | LysoCh 18:0 | LysoCh 18:2 | LysoCh 20:5 |
|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 |
| Stage I | 0.54 | 0.28 | 0.45 |
| Stage II | 0.86 | 0.35 | 0.44 |
| Stage III | 0.46 | 0.31 | 0.33 |
| Stage IVa | 0.11 | 0.10 | 0.09 |
| Stage IVb | 0.38 | 0.27 | 0.27 |

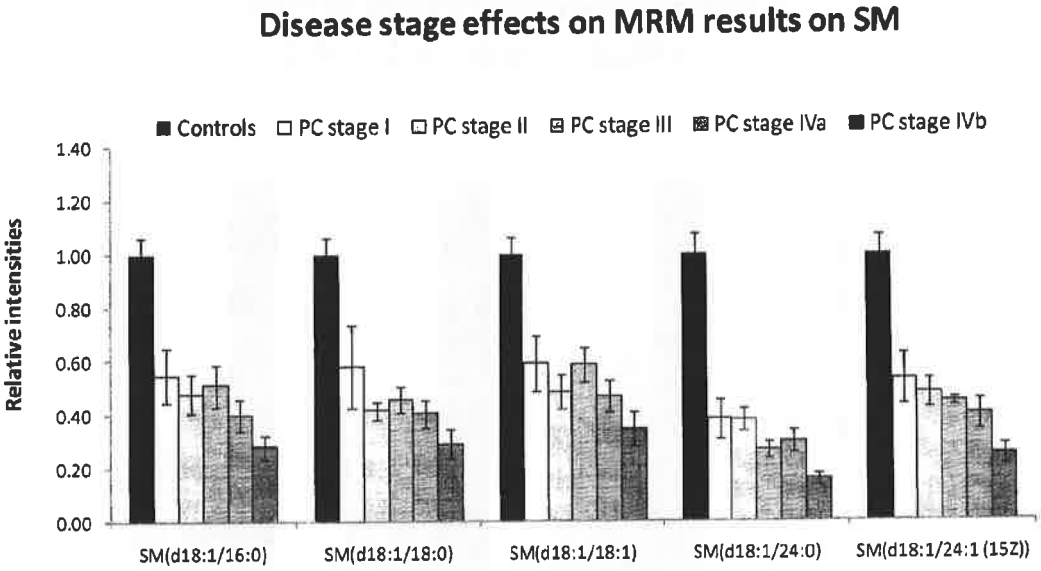
**(b)**



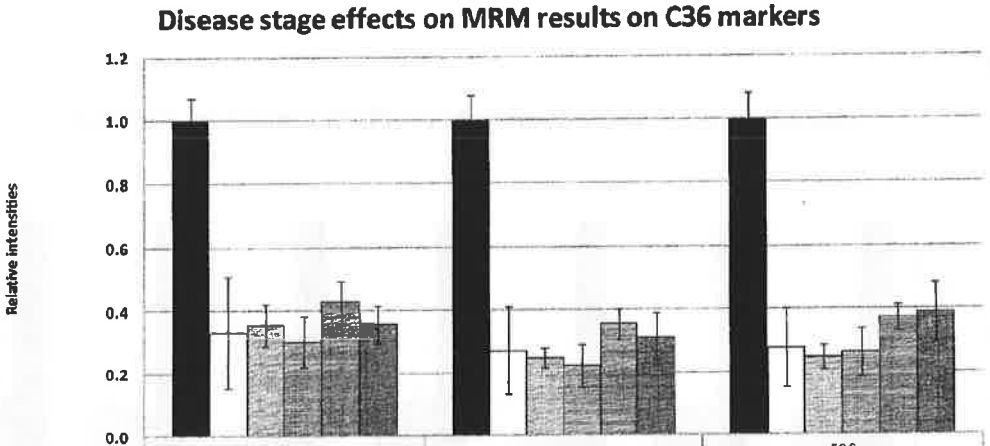

| | 757.6 | 783.6 | 785.6 | 805.6 | 807.6 | 809.6 | 833.6 |
|---|---|---|---|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Stage I | 0.33 | 0.51 | 0.33 | 0.49 | 0.46 | 0.47 | 0.50 |
| Stage II | 0.38 | 0.41 | 0.34 | 0.48 | 0.38 | 0.43 | 0.43 |
| Stage III | 0.39 | 0.35 | 0.30 | 0.51 | 0.42 | 0.42 | 0.51 |
| Stage IVa | 0.43 | 0.42 | 0.39 | 0.46 | 0.38 | 0.39 | 0.43 |
| Stage IVb | 0.22 | 0.26 | 0.19 | 0.24 | 0.19 | 0.27 | 0.23 |

**Figure 45**

(c)



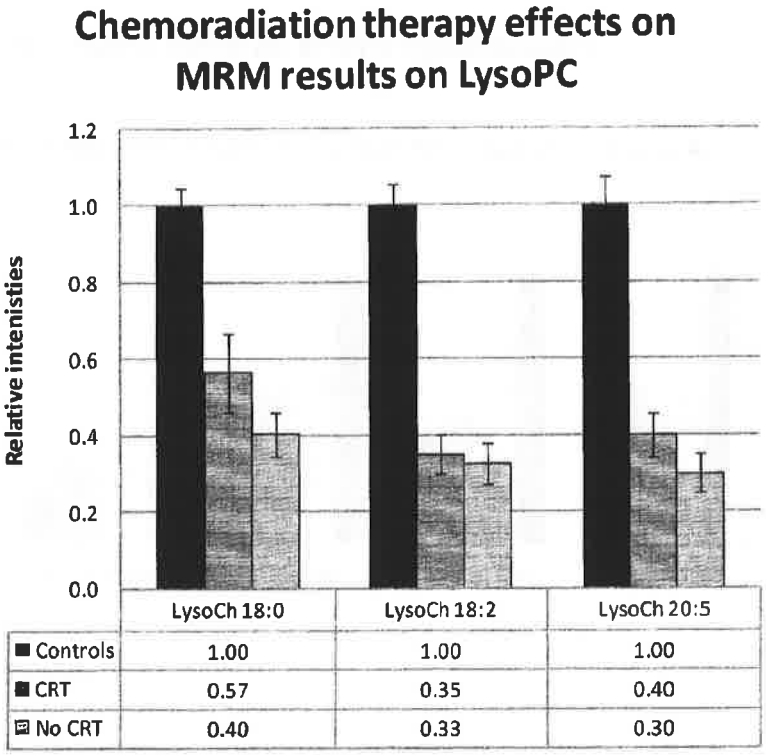

(d)




| | 576 | 594 | 596 |
|---|---|---|---|
| Healthy controls | 1.00 | 1.00 | 1.00 |
| Stage I | 0.33 | 0.27 | 0.28 |
| Stage II | 0.36 | 0.25 | 0.25 |
| Stage III | 0.30 | 0.22 | 0.26 |
| Stage IVa | 0.43 | 0.36 | 0.37 |
| Stage IVb | 0.36 | 0.31 | 0.39 |

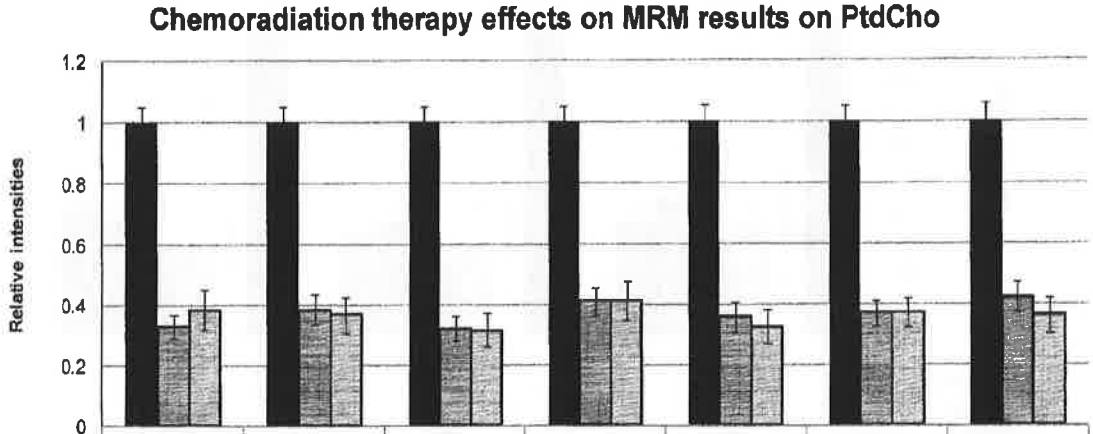
**Figure 45 (Cont.)**

**(a)**




| | LysoCh 18:0 | LysoCh 18:2 | LysoCh 20:5 |
|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 |
| CRT | 0.57 | 0.35 | 0.40 |
| No CRT | 0.40 | 0.33 | 0.30 |

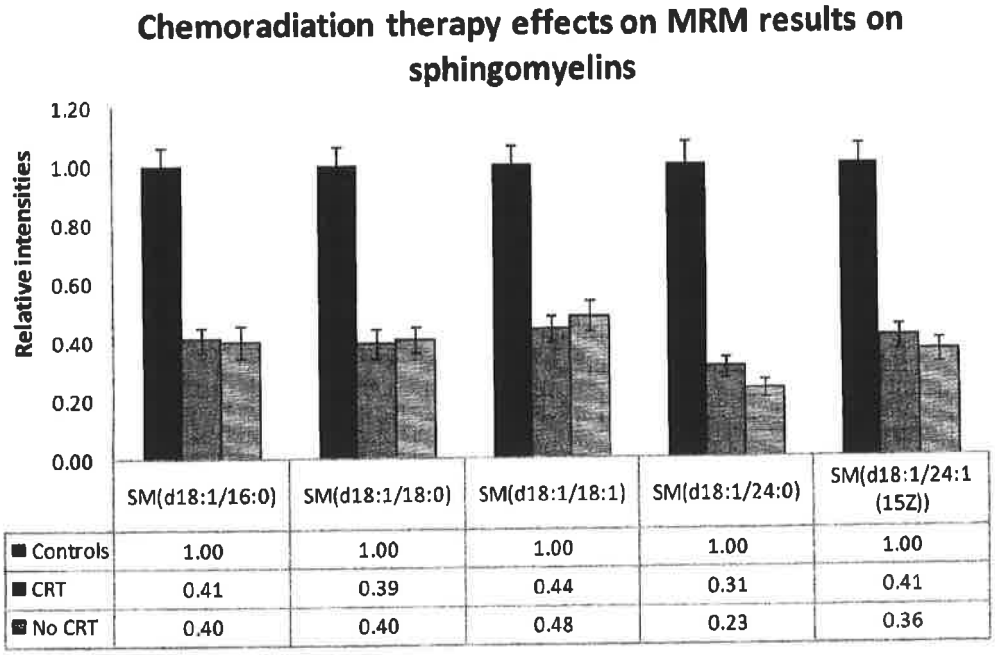
**(b)**




| | 757.6 | 783.6 | 785.6 | 805.6 | 807.6 | 809.6 | 831.6 |
|---|---|---|---|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| CRT | 0.33 | 0.38 | 0.32 | 0.41 | 0.36 | 0.37 | 0.42 |
| No CRT | 0.38 | 0.36 | 0.31 | 0.41 | 0.32 | 0.37 | 0.36 |

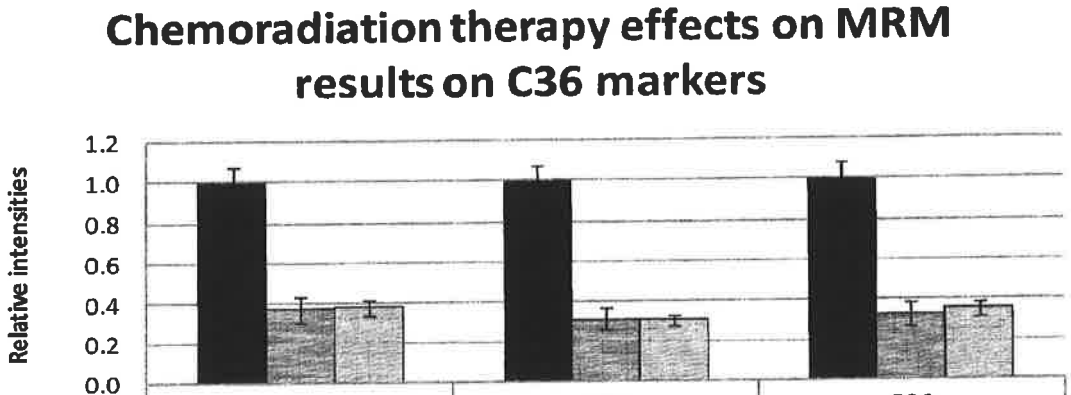
**Figure 46**

(c)




| | SM(d18:1/16:0) | SM(d18:1/18:0) | SM(d18:1/18:1) | SM(d18:1/24:0) | SM(d18:1/24:1 (15Z)) |
|---|---|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| CRT | 0.41 | 0.39 | 0.44 | 0.31 | 0.41 |
| No CRT | 0.40 | 0.40 | 0.48 | 0.23 | 0.36 |

(d)




| | 576 | 594 | 596 |
|---|---|---|---|
| Controls | 1.00 | 1.00 | 1.00 |
| CRT | 0.37 | 0.31 | 0.33 |
| No CRT | 0.38 | 0.31 | 0.35 |

**Figure 46 (Cont.)**