Supplementary data file :

Heterochromatin-associated interactions of *Drosophila* HP1 with dADD1, HIPP1, and repetitive RNAs

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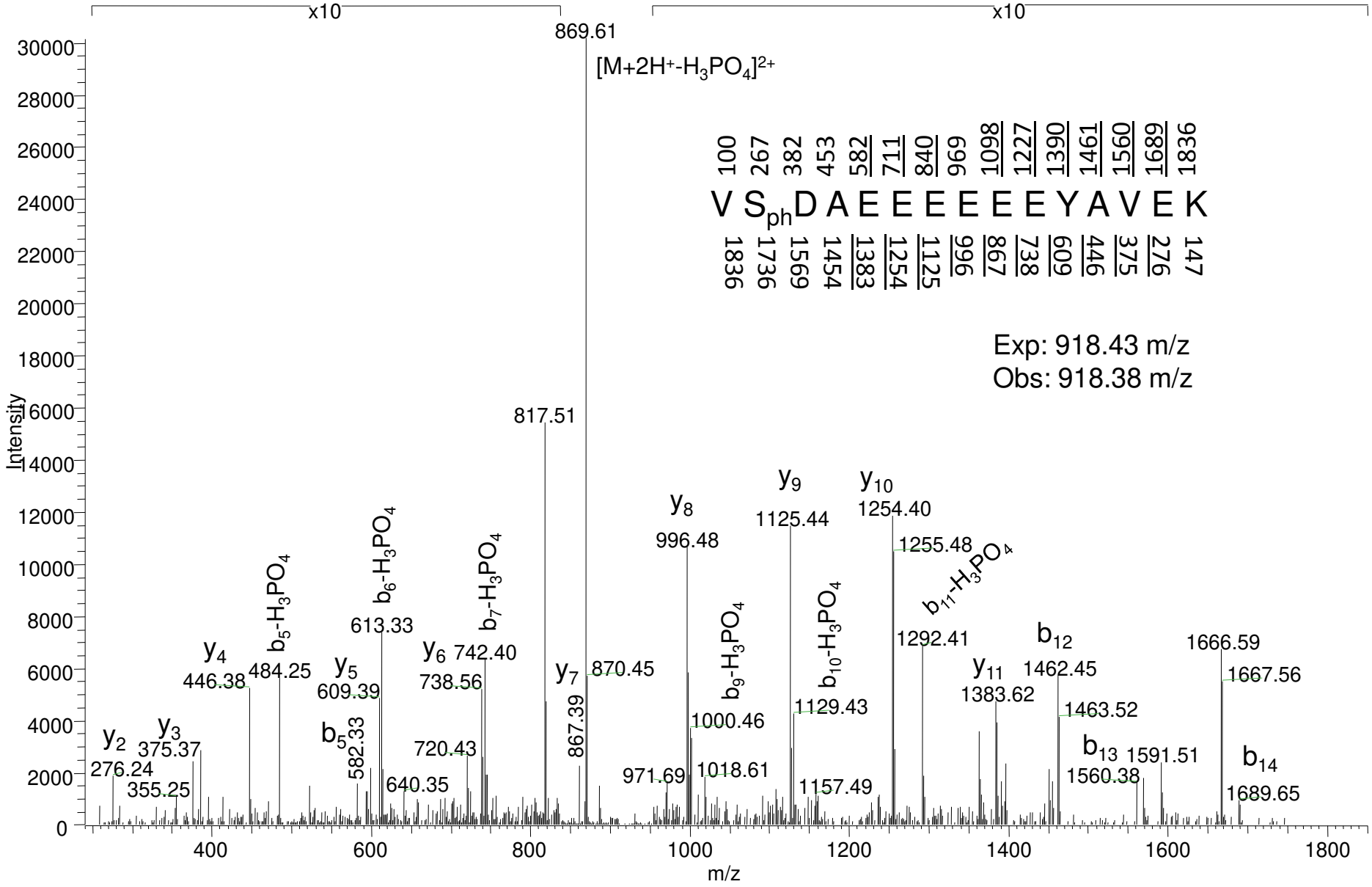
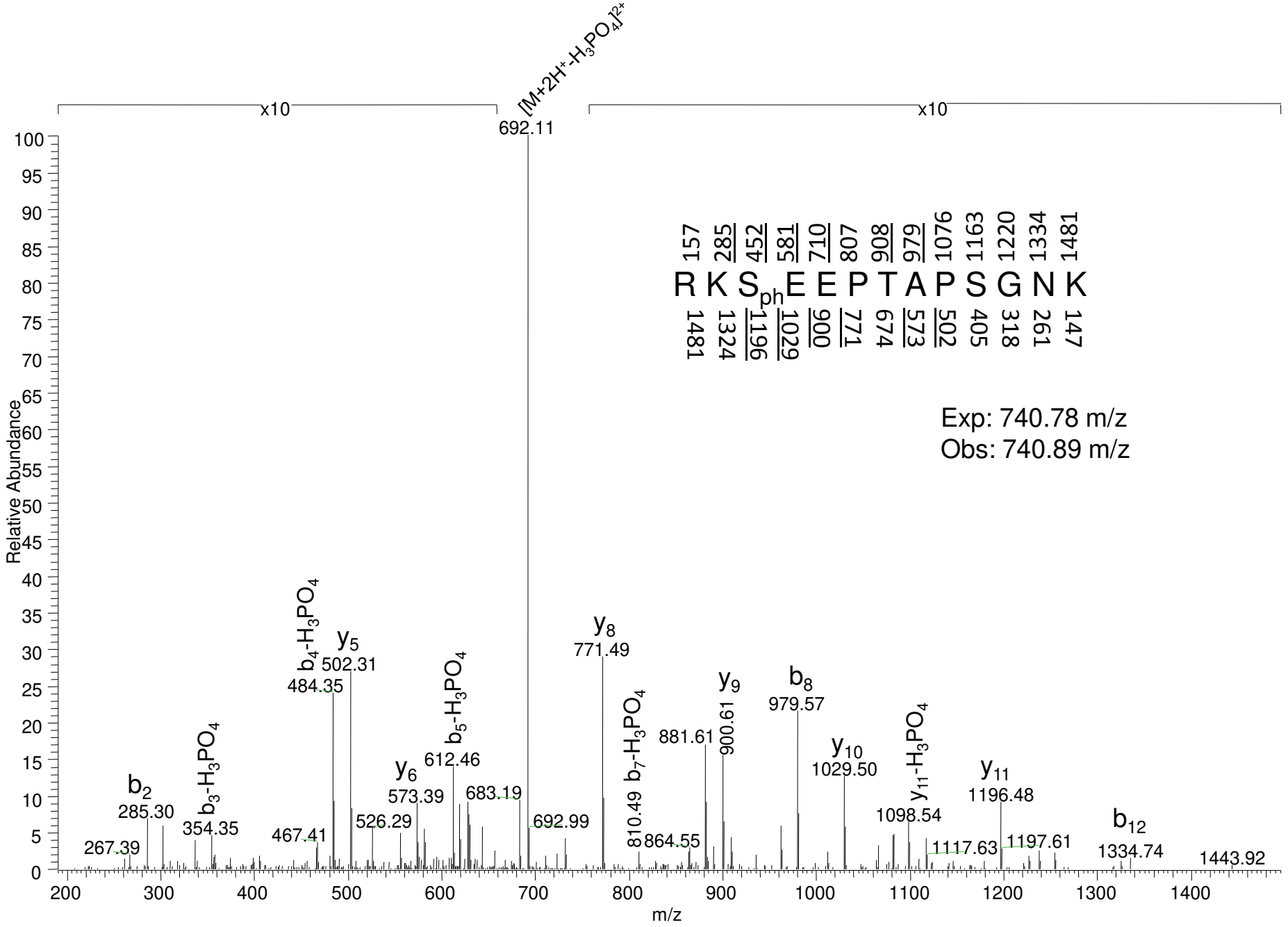
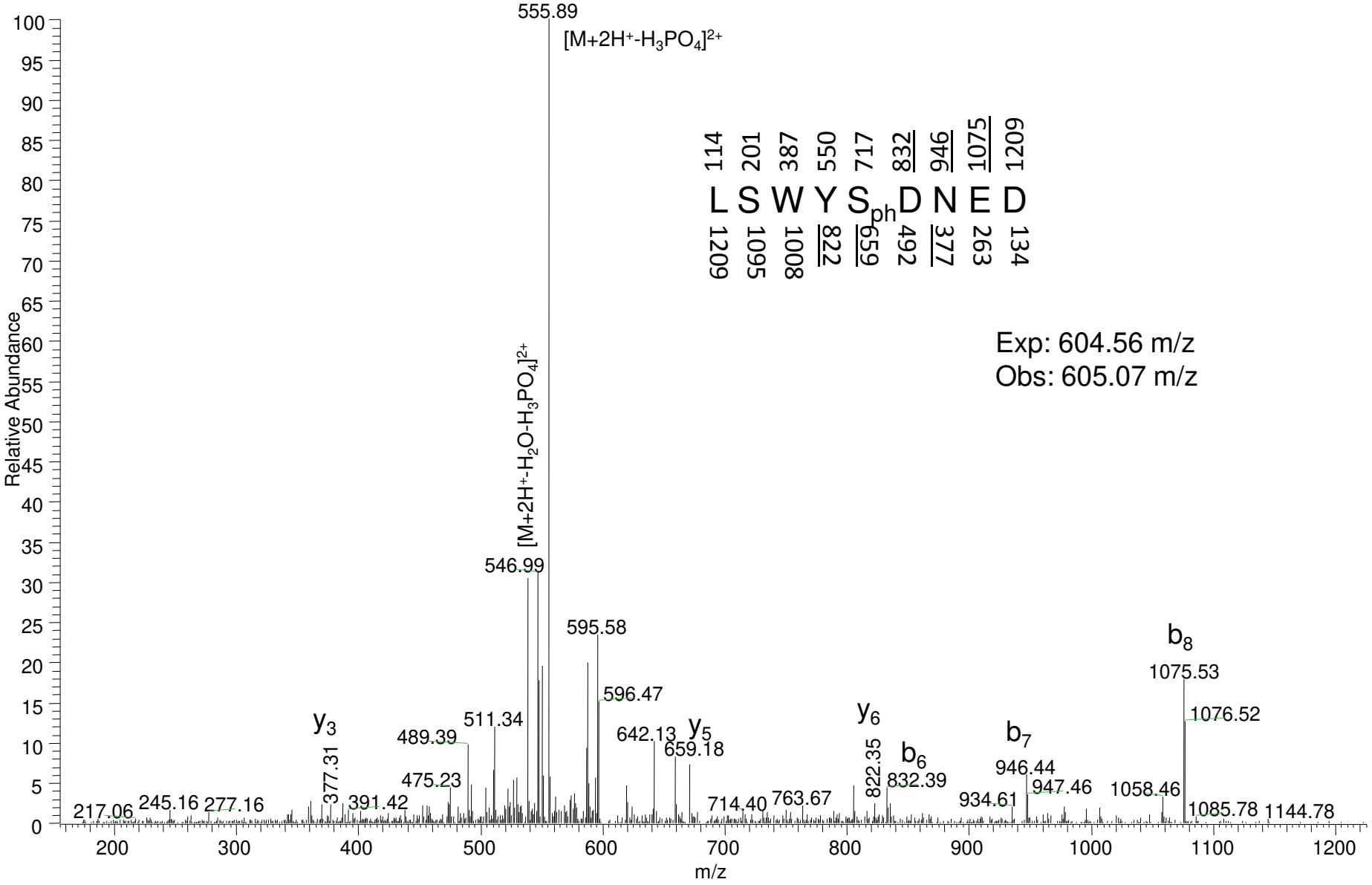
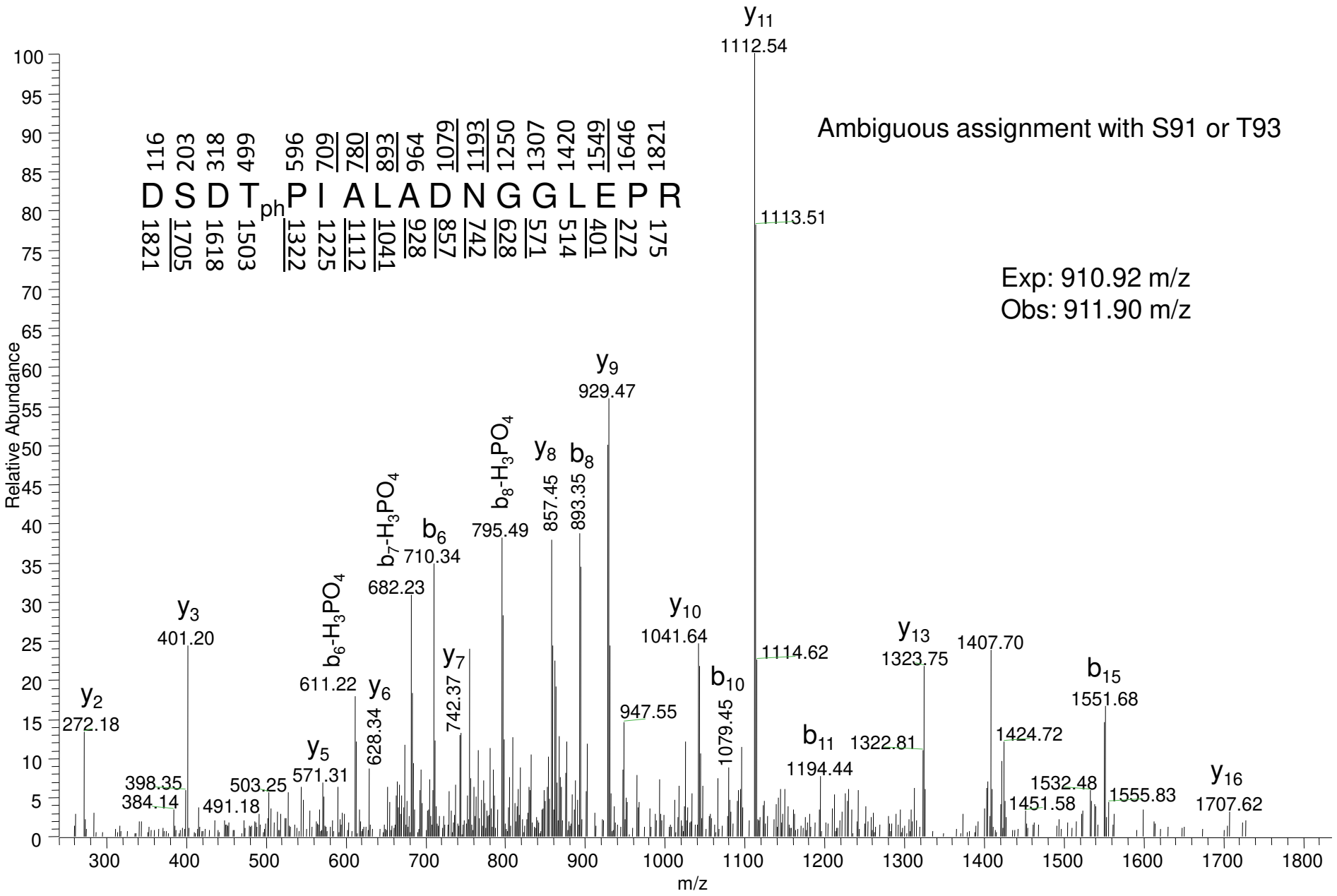
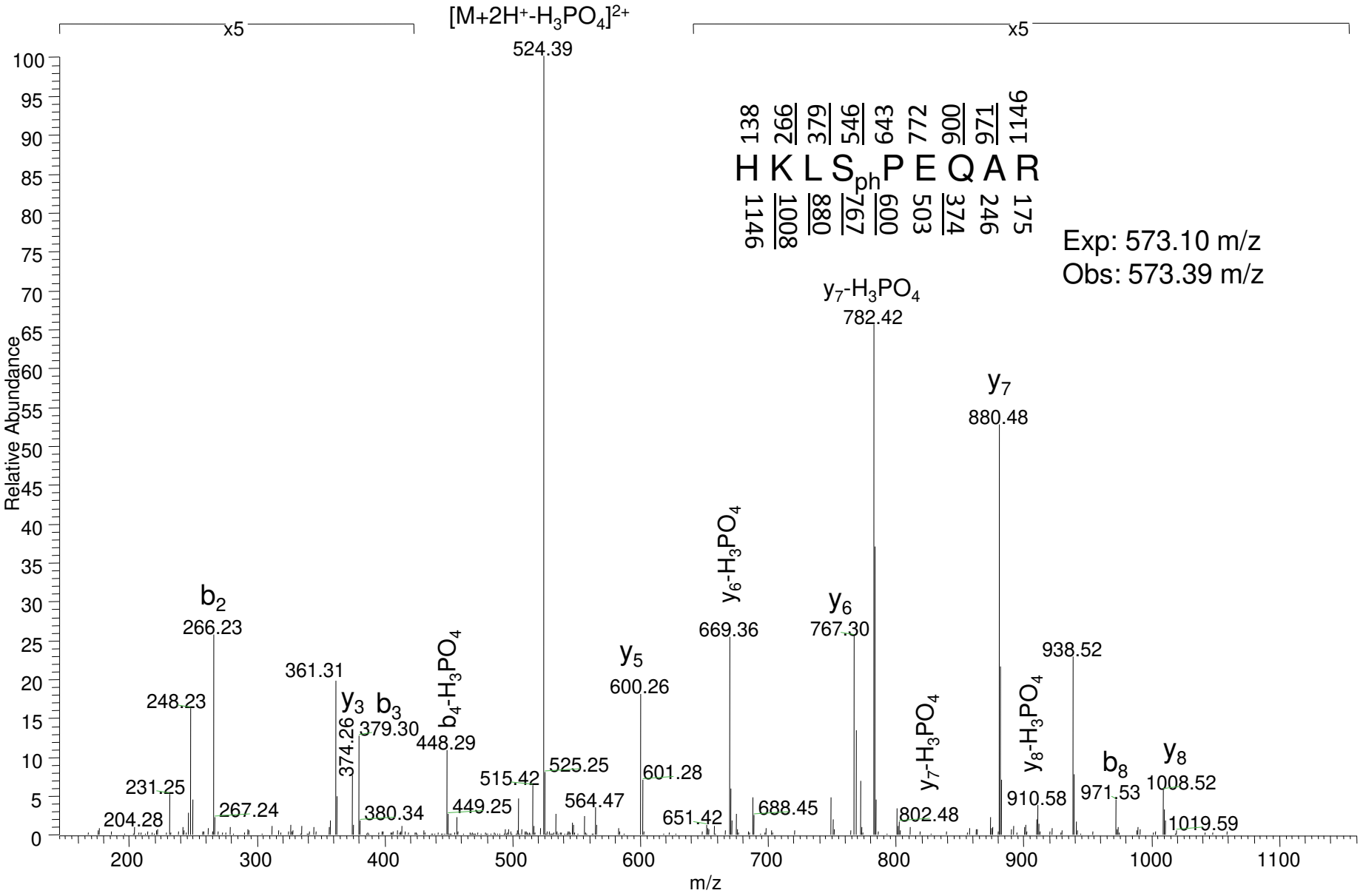
MS/MS of phosphorylated peptides of HP1a, CG3680, and CG8290.
MS/MS of phosphorylated residues summarized in **Figure S5** are provided with annotations. Note that both MS and MS/MS were collected in the ion trap, where ions in MS/MS resulted from collision induced dissociation. Underlined nominal fragment ion masses above and below the peptide sequence indicate b and y ions respectively that were positively identified in the spectrum. Expected average and observed precursor ion masses are also provided for each spectrum. Abbreviations: $[M+2H^+-H_3PO_4]^{+2}$ = doubly charged precursor ion with loss of phosphate ion; $[M+2H^+-H_2O-H_3PO_4]^{+2}$ = doubly charged precursor ion with loss of both phosphate and water molecule; $[M+2H^+-NH_3]^{+2}$ = doubly charged precursor ion with loss of ammonium ion.

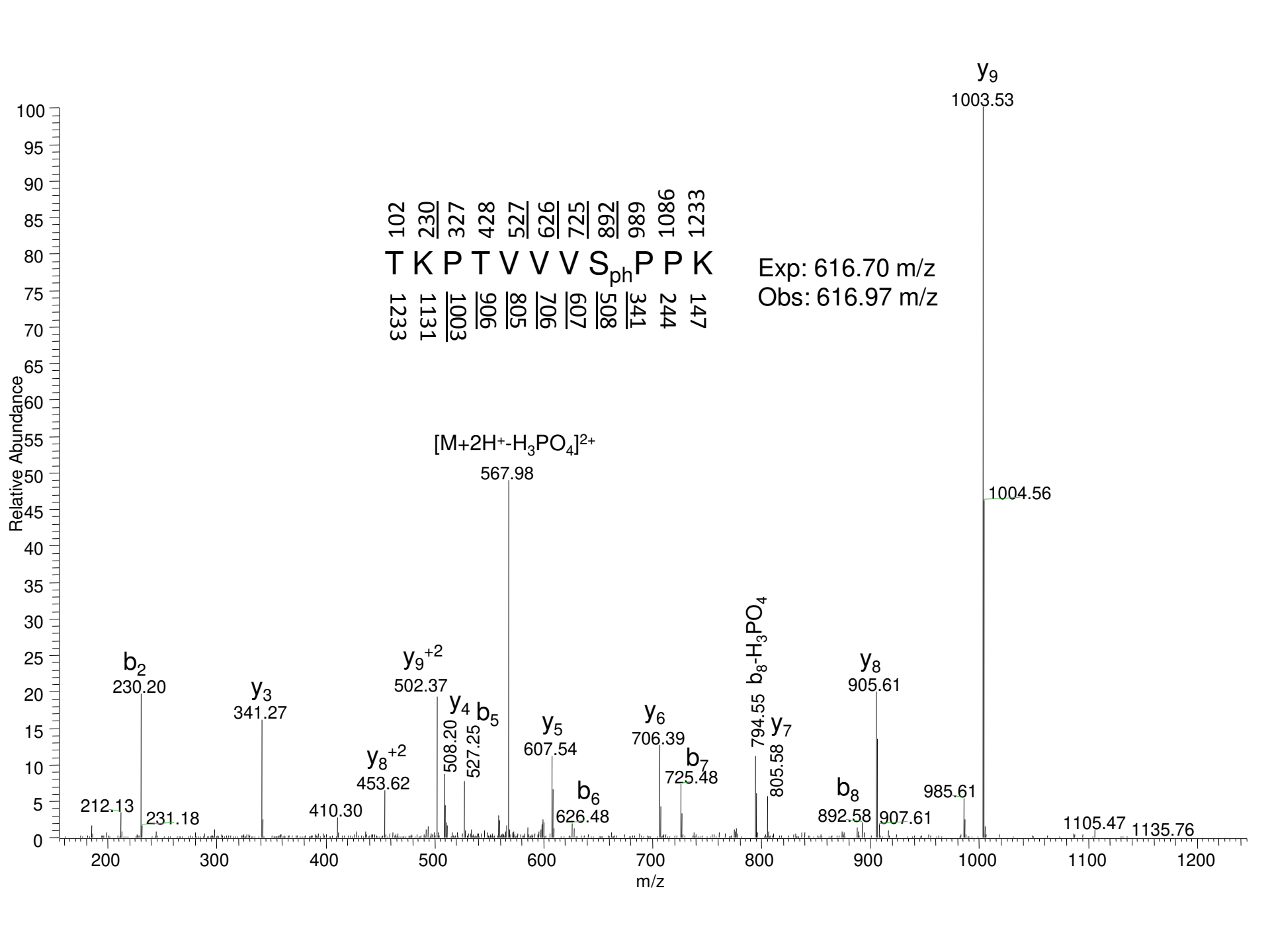

x10
x10
869.61
[M+2H+-H3PO4]2+
100 267 382 453 582 711 840 969 1098 1227 1390 1461 1560 1689 1836
V S ph D A E E E E E E Y A V E K
1836 1736 1569 1454 1383 1254 1125 996 867 738 609 446 375 276 147
Exp: 918.43 m/z
Obs: 918.38 m/z
Intensity
m/z
817.51
y8
996.48
y9
1125.44
y10
1254.40
1255.48
b11-H3PO4
b6-H3PO4
b7-H3PO4
b9-H3PO4
b10-H3PO4
613.33
y4
446.38
484.25
b5-H3PO4
y5
609.39
y6
738.56
742.40
y7
867.39
870.45
1292.41
b12
1462.45
1666.59
1667.56
y11
1383.62
1463.52
1129.43
1000.46
b13
1591.51
b14
1560.38
1689.65
971.69
1018.61
1157.49
720.43
582.33
640.35
y2
276.24
y3
375.37
355.25

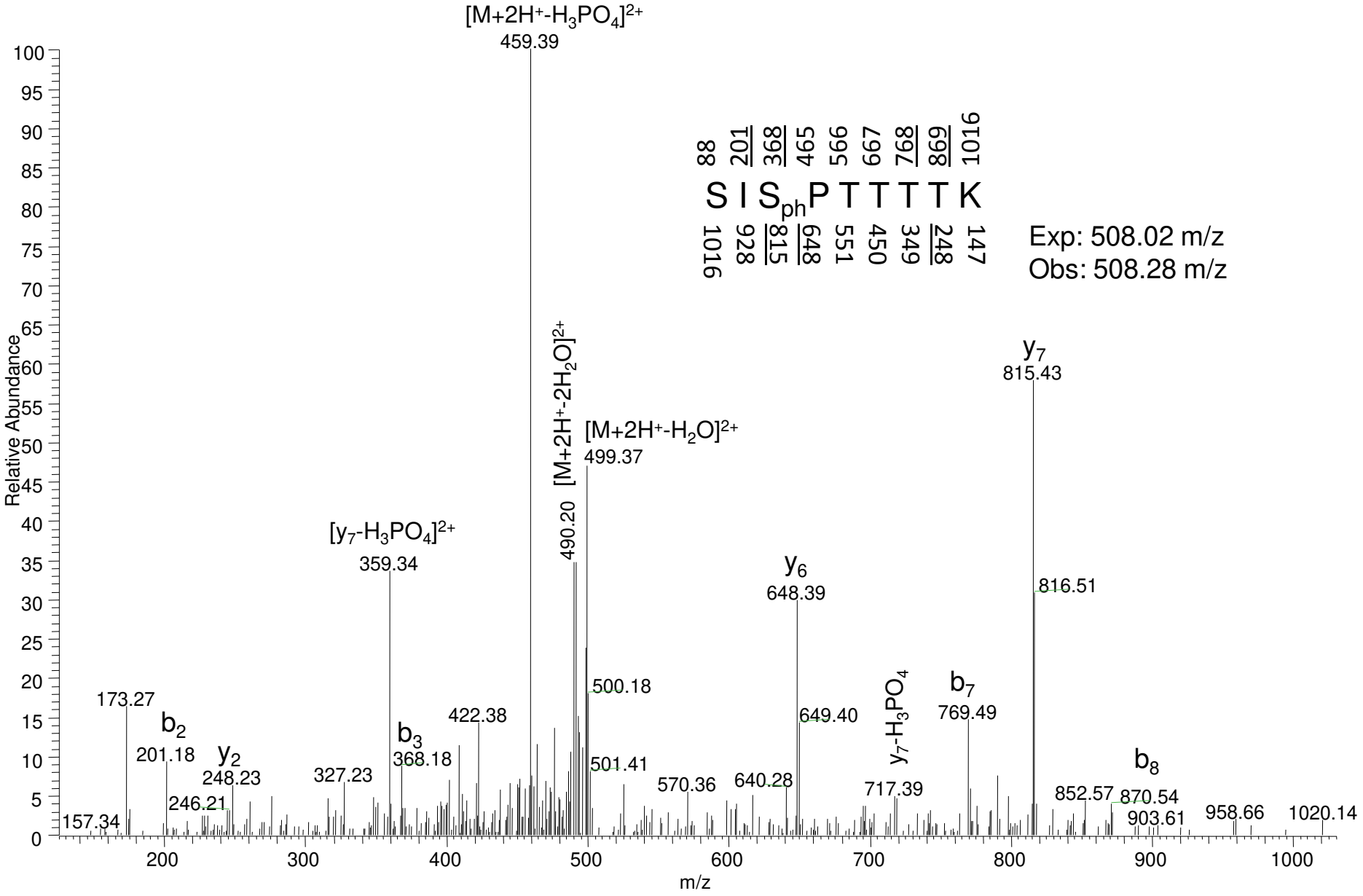

[M+2H+-H3PO4]2+
692.11
x10
x10
Relative Abundance
m/z
R K S(ph) E E P T A P S G N K
157 285 452 581 710 807 908 979 1076 1163 1220 1334 1481
1481 1324 1196 1029 900 771 674 573 502 405 318 261 147
Exp: 740.78 m/z
Obs: 740.89 m/z
b2
285.30
b3-H3PO4
354.35
b4-H3PO4
484.35
y5
502.31
y6
573.39
b5-H3PO4
612.46
683.19
692.99
y8
771.49
b7-H3PO4
810.49
881.61
y9
900.61
b8
979.57
y10
1029.50
y11-H3PO4
1098.54
y11
1196.48
1117.63
1197.61
b12
1334.74
1443.92
267.39
467.41
526.29
864.55

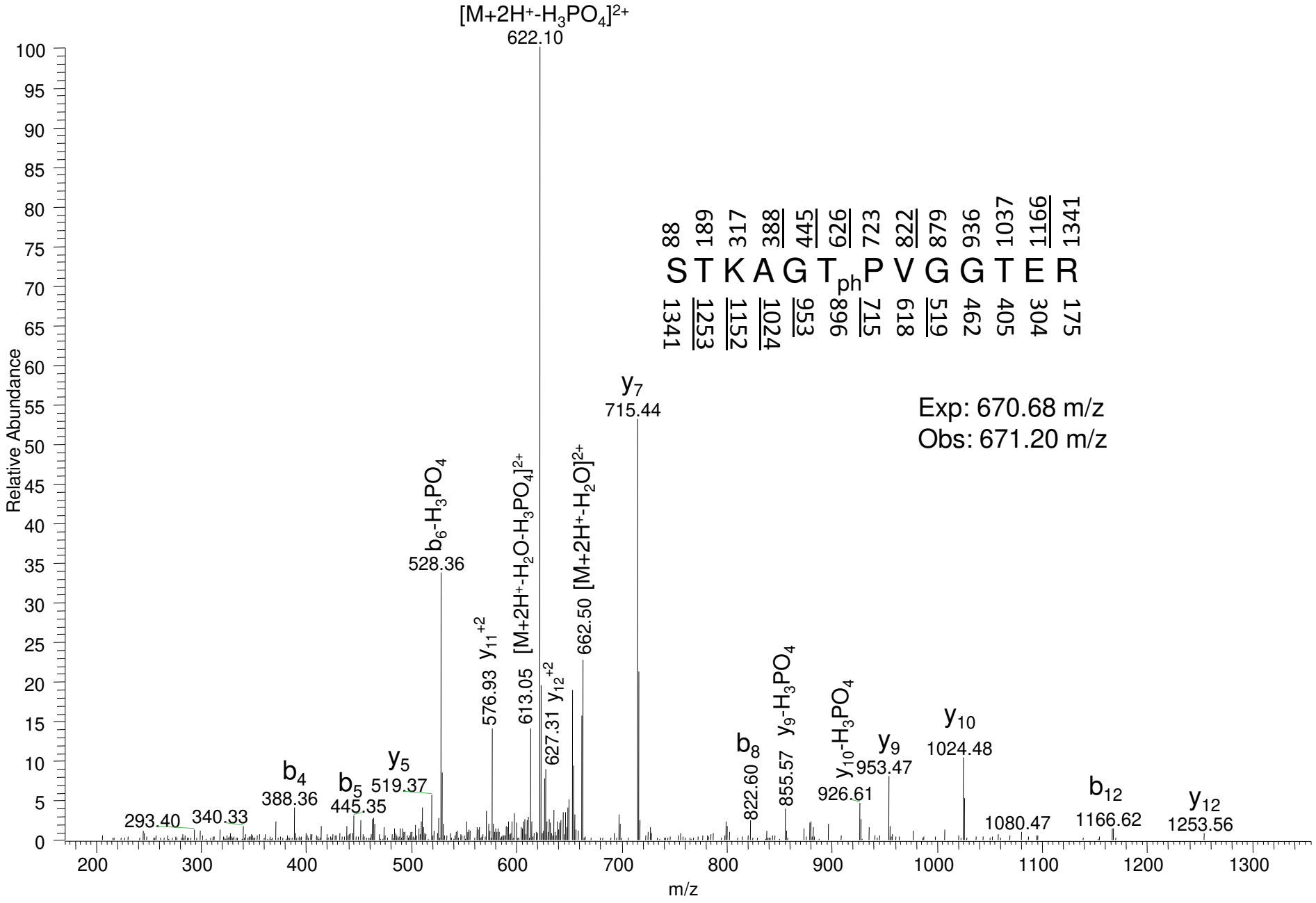

555.89
[M+2H+-H3PO4]2+
[M+2H+-H2O-H3PO4]2+
546.99
595.58
596.47
642.13
659.18
714.40
763.67
822.35
832.39
934.61
946.44
947.46
1058.46
1075.53
1076.52
1085.78
1144.78
y3
377.31
489.39
511.34
475.23
391.42
y5
y6
b6
b7
b8
217.06
245.16
277.16
114 201 387 550 717 832 946 1075 1209
L S W Y Sph D N E D
1209 1095 1008 822 659 492 377 263 134
Exp: 604.56 m/z
Obs: 605.07 m/z
Relative Abundance
m/z

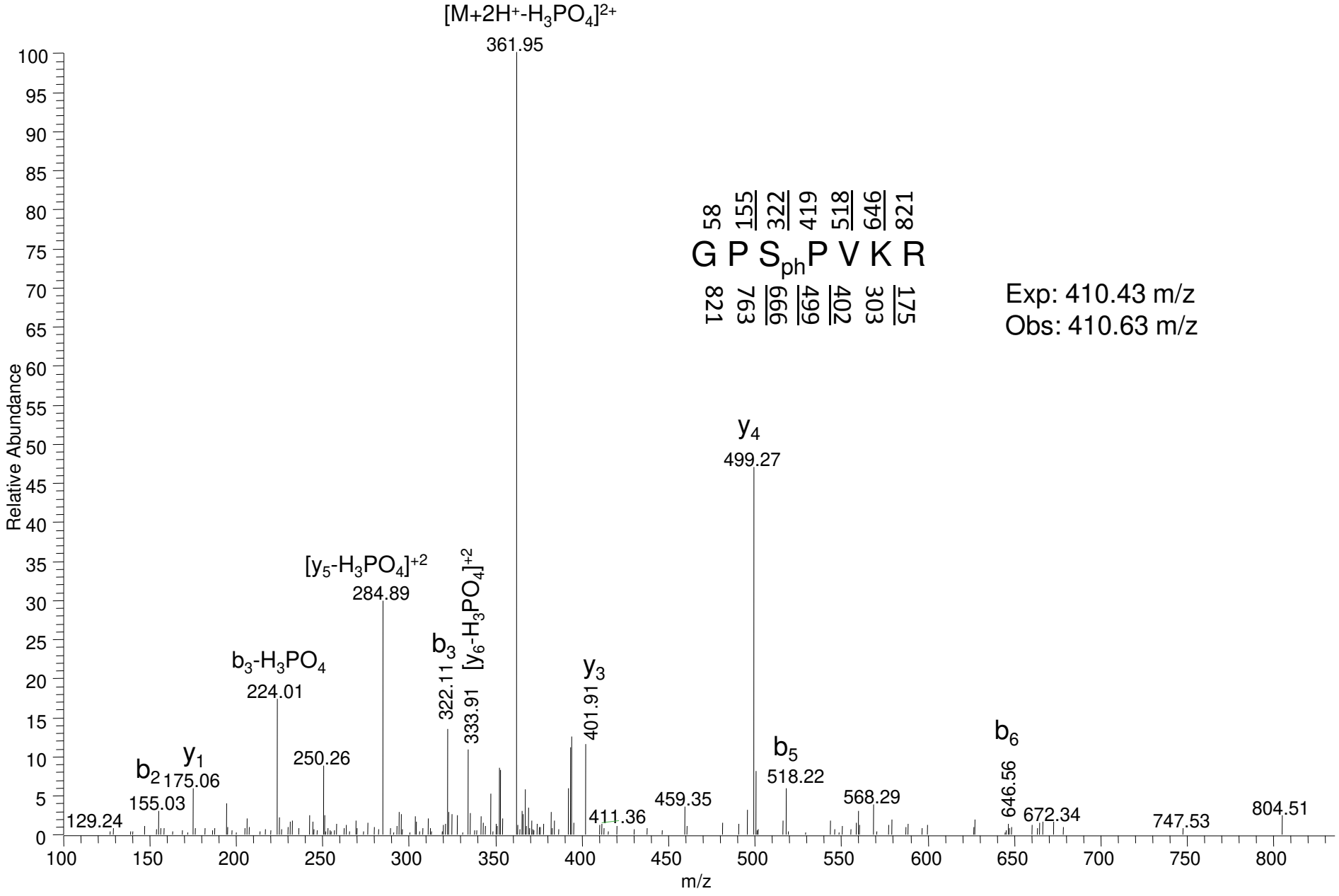

Ambiguous assignment with S91 or T93
Exp: 910.92 m/z
Obs: 911.90 m/z
DSDTphPIALADNGGLEPR
Relative Abundance
m/z
y11 1112.54
1113.51
y9 929.47
y8 857.45
b8 893.35
b8-H3PO4 795.49
b7-H3PO4 682.23
b6 710.34
b6-H3PO4 611.22
y3 401.20
y2 272.18
y6 628.34
y7 742.37
y5 571.31
y10 1041.64
b10 1079.45
947.55
1114.62
y13 1323.75
1407.70
b15 1551.68
b11 1194.44
1322.81
1424.72
y16 1707.62
1532.48
1555.83
1451.58
398.35
384.14
491.18
503.25

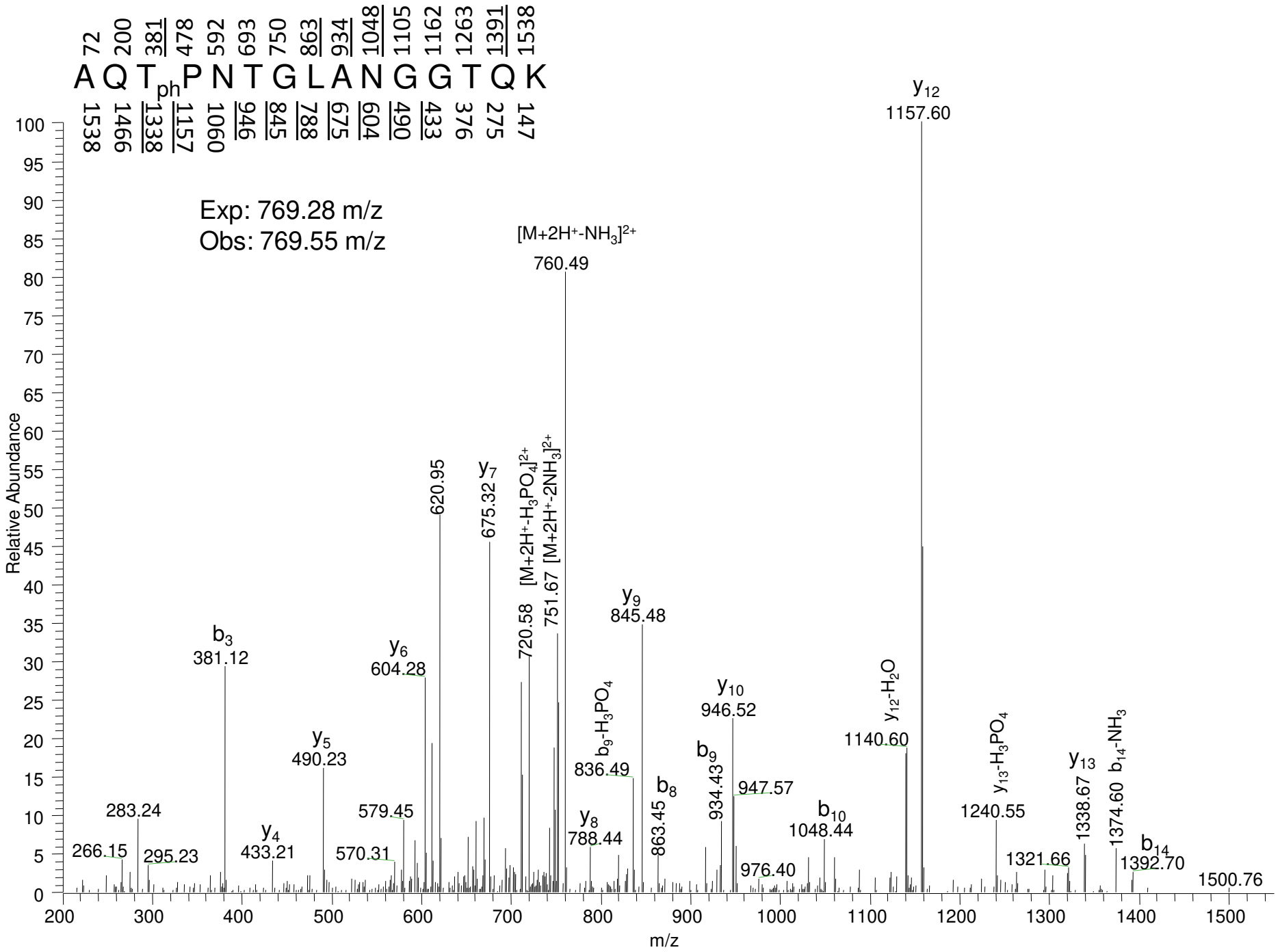

[M+2H+-H3PO4]2+
x5
x5
524.39
H K L Sph P E Q A R
138 266 379 546 643 772 900 971 1146
1146 1008 880 767 600 503 374 246 175
Exp: 573.10 m/z
Obs: 573.39 m/z
y7-H3PO4
782.42
y7
880.48
y6-H3PO4
669.36
y6
767.30
y5
600.26
b2
266.23
248.23
361.31
y3
b3
374.26
379.30
b4-H3PO4
448.29
231.25
204.28
267.24
380.34
449.25
515.42
525.25
564.47
601.28
651.42
688.45
802.48
y7-H3PO4
y8-H3PO4
938.52
910.58
b8
971.53
y8
1008.52
1019.59
Relative Abundance
m/z
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
200
300
400
500
600
700
800
900
1000
1100

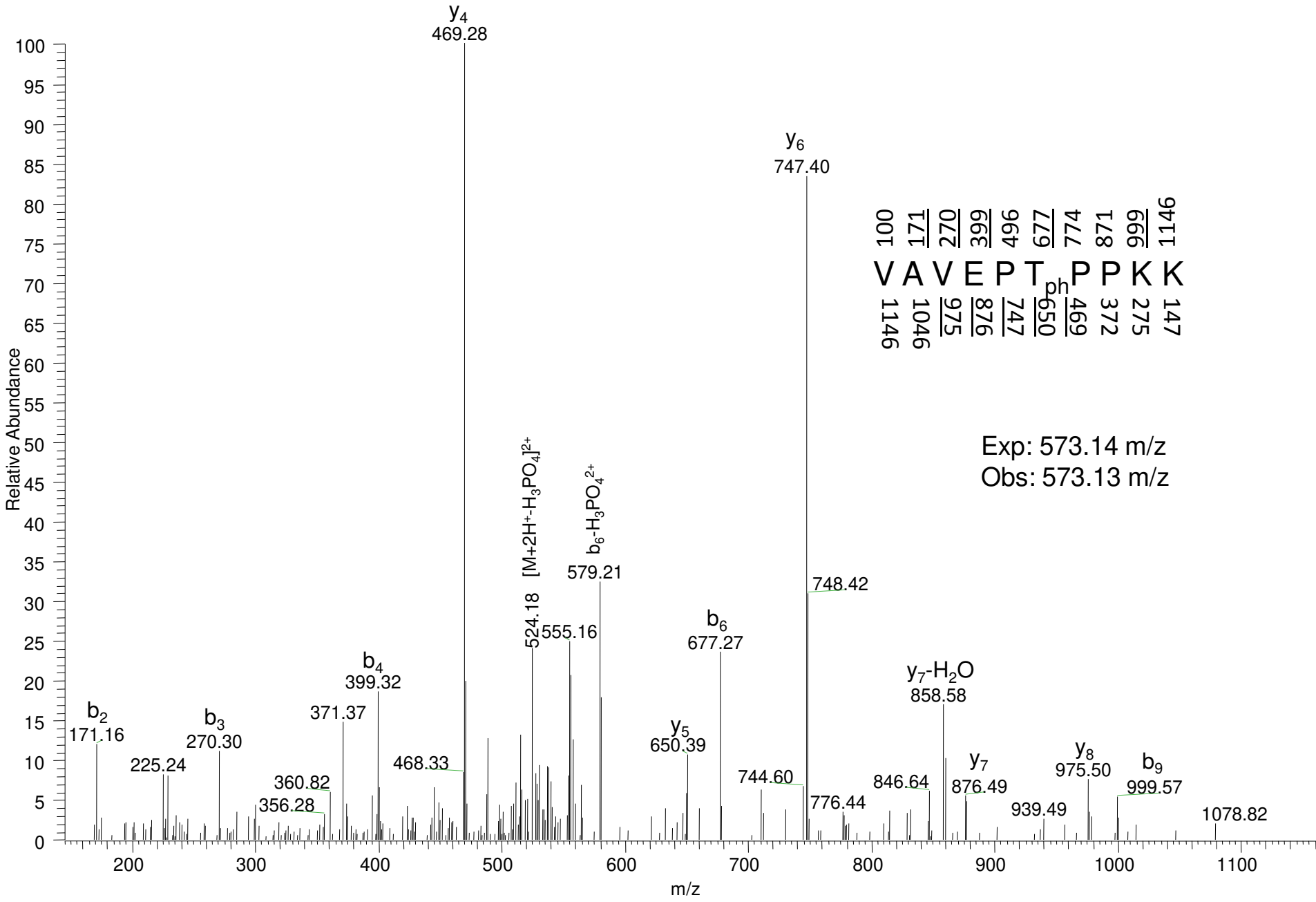

y9
1003.53
102 230 327 428 527 626 725 892 989 1086 1233
T K P T V V V S(ph) P P K
1233 1131 1003 906 805 706 607 508 341 244 147
Exp: 616.70 m/z
Obs: 616.97 m/z
[M+2H+-H3PO4]2+
567.98
1004.56
b2
230.20
y3
341.27
y9+2
502.37
y4
508.20
b5
527.25
y8+2
453.62
y5
607.54
b6
626.48
y6
706.39
b7
725.48
b8-H3PO4
794.55
y7
805.58
y8
905.61
b8
892.58
907.61
985.61
212.13
231.18
410.30
1105.47
1135.76
Relative Abundance
m/z

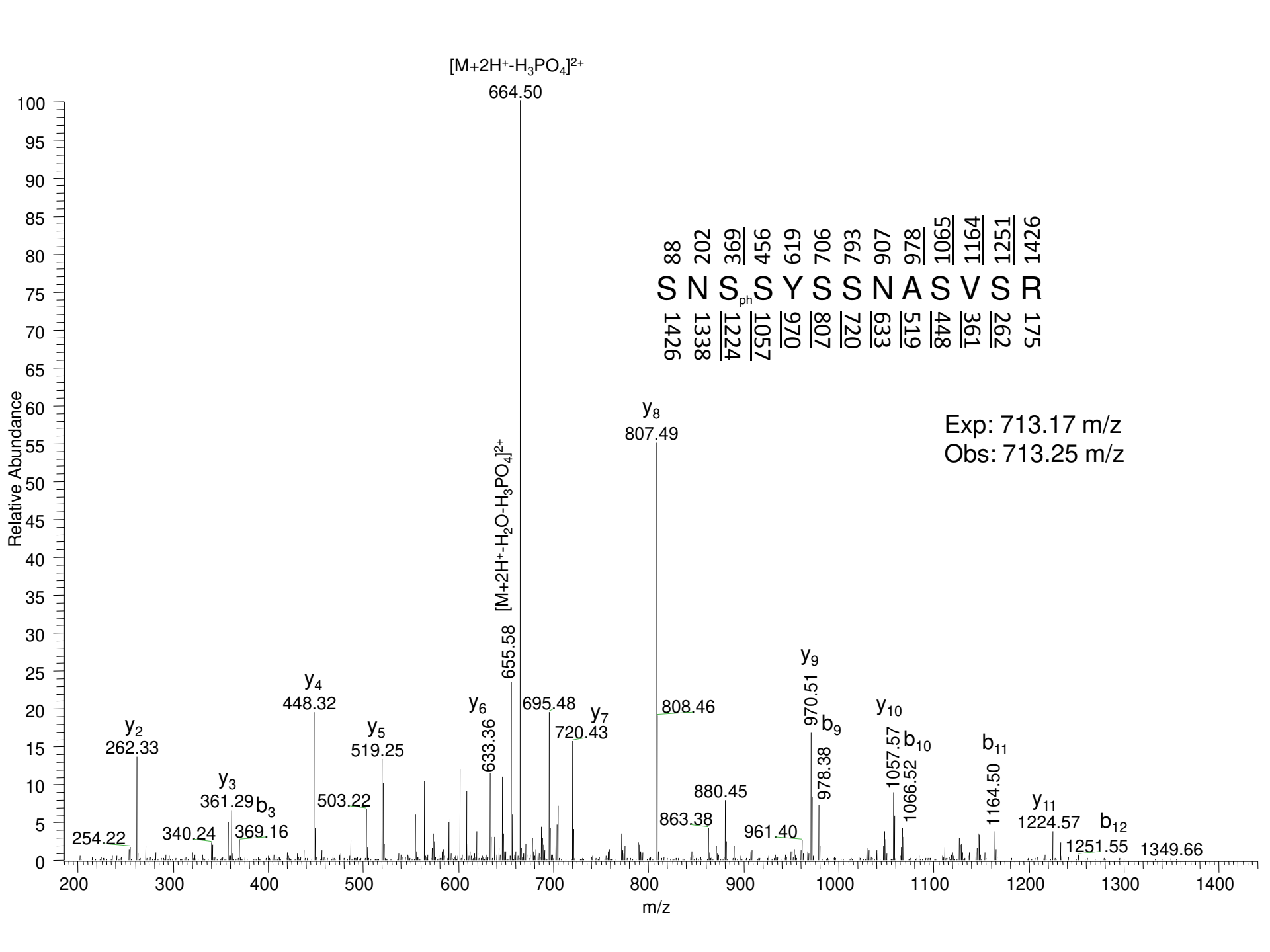

[M+2H+-H3PO4]2+
459.39
88 201 368 465 566 667 768 869 1016
S I Sph P T T T T K
1016 928 815 648 551 450 349 248 147
Exp: 508.02 m/z
Obs: 508.28 m/z
[M+2H+-2H2O]2+
490.20
[M+2H+-H2O]2+
499.37
[y7-H3PO4]2+
359.34
y7
815.43
y6
648.39
816.51
500.18
649.40
y7-H3PO4
b7
769.49
422.38
173.27
b2
201.18
y2
248.23
b3
368.18
327.23
501.41
570.36
640.28
717.39
b8
852.57
870.54
903.61
958.66
1020.14
246.21
157.34
Relative Abundance
m/z
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
200
300
400
500
600
700
800
900
1000

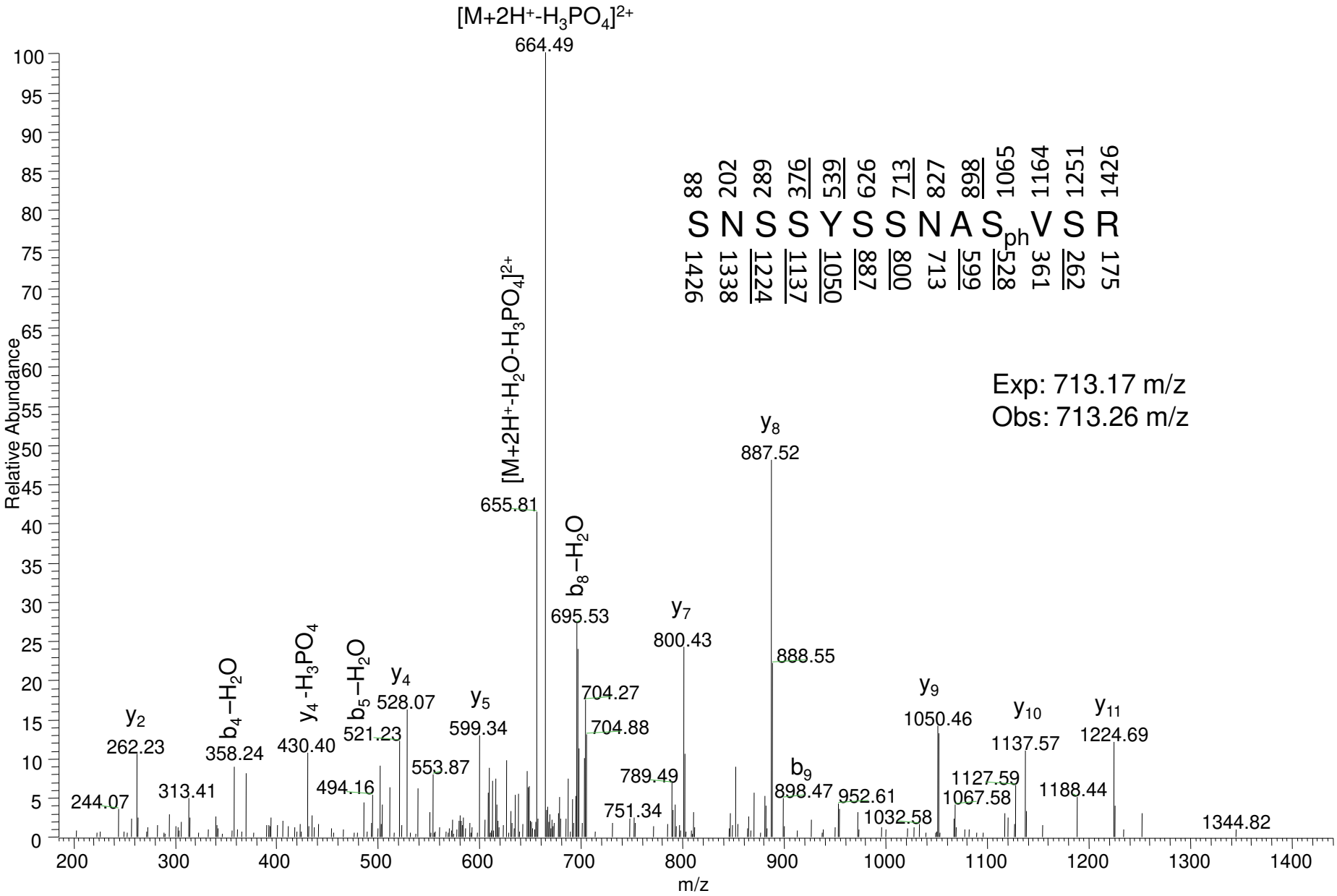

[M+2H+-H3PO4]2+
622.10
Relative Abundance
m/z
STKAGTphPVGGGTER
88 189 317 388 445 626 723 822 879 936 1037 1166 1341
1341 1253 1152 1024 953 866 715 618 519 462 405 304 175
Exp: 670.68 m/z
Obs: 671.20 m/z
y7
715.44
b6-H3PO4
528.36
[M+2H+-H2O-H3PO4]2+
613.05
y11+2
576.93
y12+2
627.31
[M+2H+-H2O]2+
662.50
b4
388.36
b5
445.35
y5
519.37
293.40
340.33
b8
822.60
y9-H3PO4
855.57
y10-H3PO4
926.61
y9
953.47
y10
1024.48
1080.47
b12
1166.62
y12
1253.56

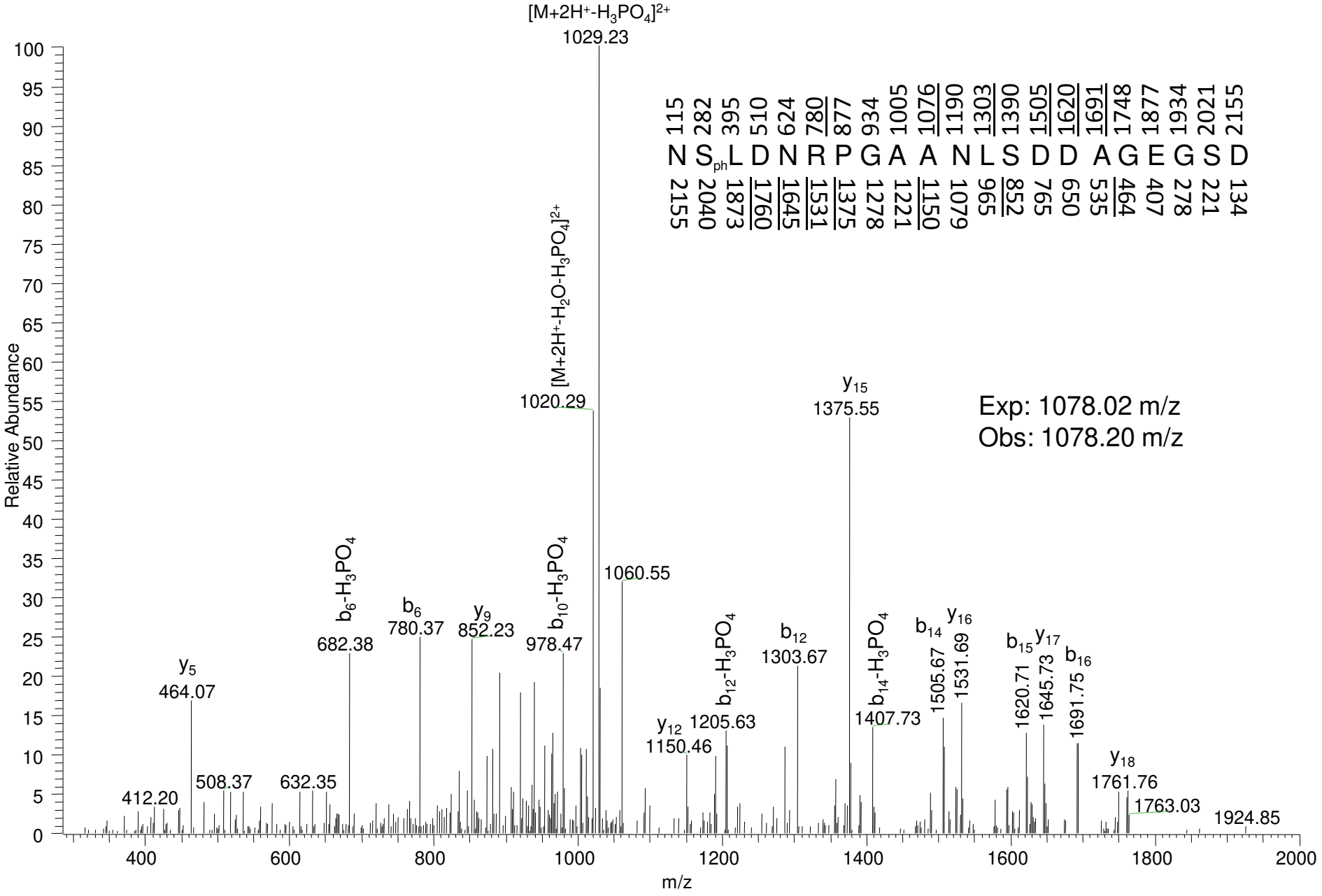

[M+2H+-H3PO4]2+
361.95
58 155 322 419 518 646 821
G P SphP V K R
821 763 666 499 402 303 175
Exp: 410.43 m/z
Obs: 410.63 m/z
y4
499.27
[y5-H3PO4]+2
284.89
b3
322.11
[y6-H3PO4]+2
333.91
b3-H3PO4
224.01
y3
401.91
y1
175.06
b2
155.03
250.26
b5
518.22
b6
646.56
129.24
411.36
459.35
568.29
672.34
747.53
804.51
Relative Abundance
m/z

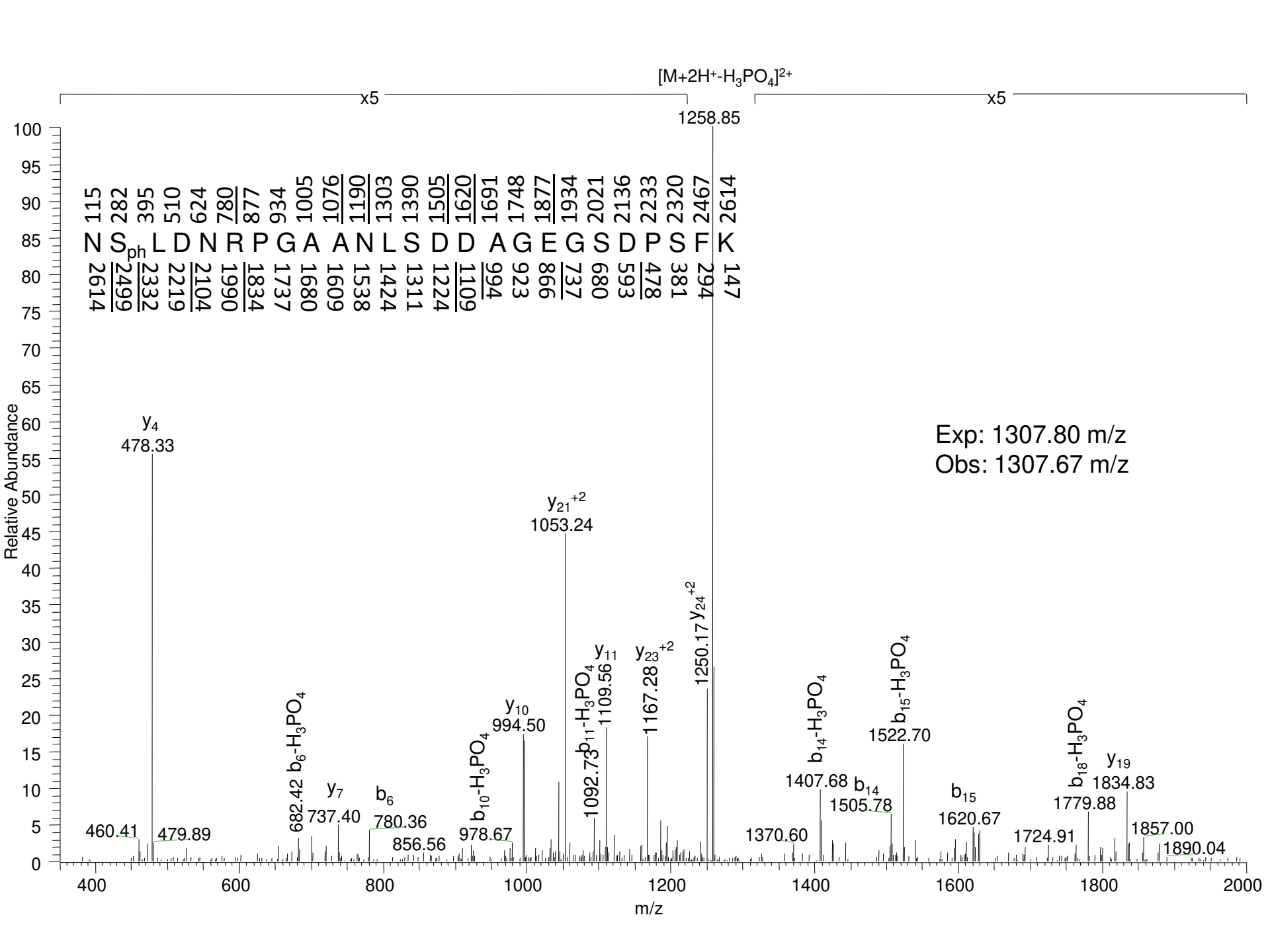

72 200 381 478 592 693 750 863 934 1048 1105 1162 1263 1391 1538
AQT(ph)PNTGLANGGTQK
1538 1466 1338 1157 1060 946 845 788 675 604 490 433 376 275 147
Exp: 769.28 m/z
Obs: 769.55 m/z
Relative Abundance
m/z
y12 1157.60
[M+2H+-NH3]2+ 760.49
y7 675.32
620.95
[M+2H+-H3PO4]2+ 720.58
[M+2H+-2NH3]2+ 751.67
y9 845.48
b3 381.12
y6 604.28
b9-H3PO4 836.49
y10 946.52
y12-H2O 1140.60
y5 490.23
b9 934.43
947.57
b8 863.45
y13-H3PO4 1240.55
y13 1338.67
b14-NH3 1374.60
283.24
y8 788.44
b10 1048.44
y4 433.21
579.45
266.15
295.23
570.31
976.40
1321.66
b14 1392.70
1500.76

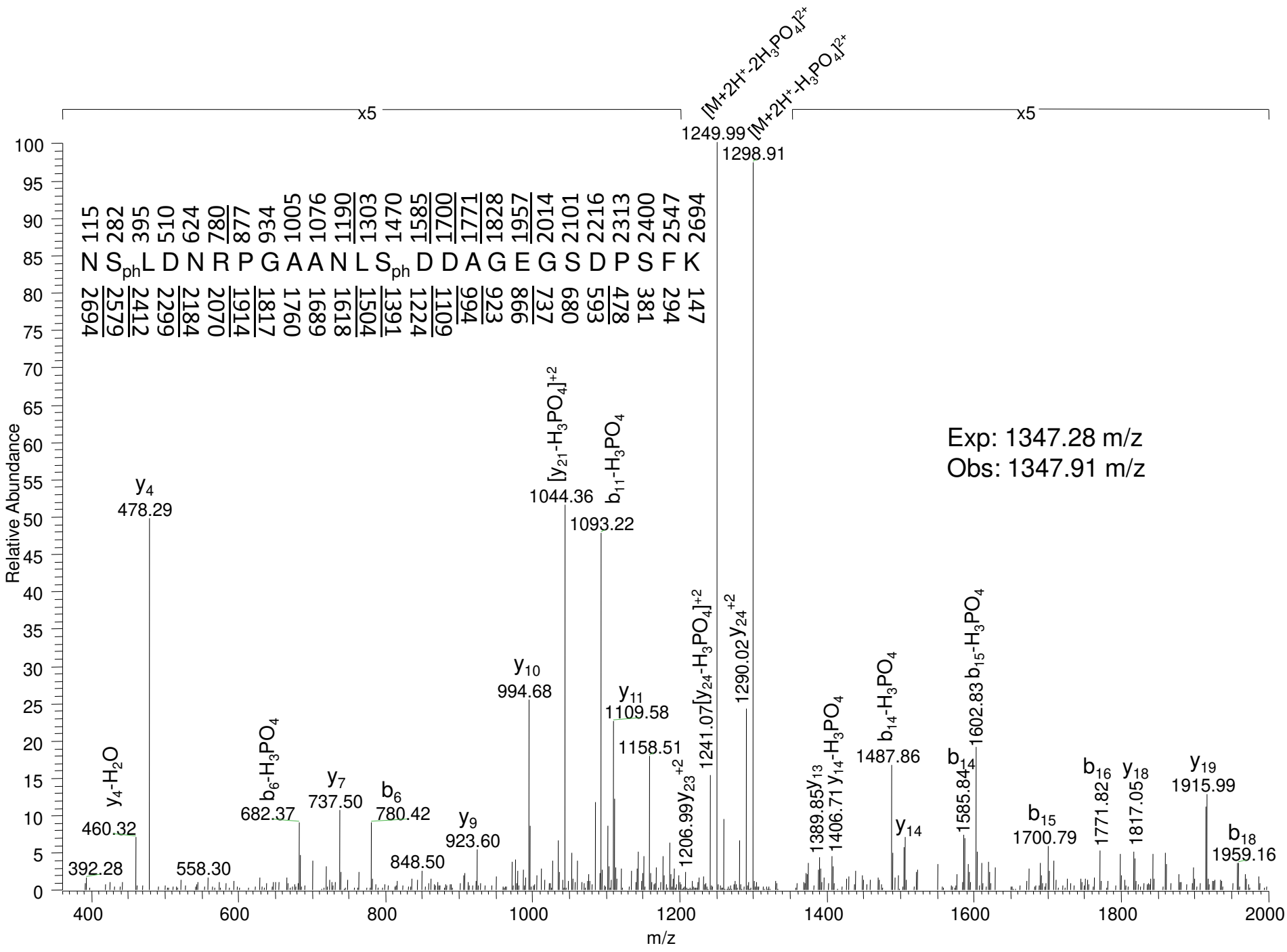

y4
469.28
y6
747.40
100 171 270 399 496 677 774 871 999 1146
V A V E P T ph P P K K
1146 1046 975 876 747 650 469 372 275 147
Exp: 573.14 m/z
Obs: 573.13 m/z
[M+2H+-H3PO4]2+
524.18
b6-H3PO4 2+
579.21
555.16
748.42
b6
677.27
y7-H2O
858.58
b4
399.32
371.37
b2
171.16
b3
270.30
225.24
y5
650.39
468.33
360.82
356.28
744.60
776.44
846.64
y7
876.49
y8
975.50
b9
999.57
939.49
1078.82
Relative Abundance
m/z
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
200 300 400 500 600 700 800 900 1000 1100

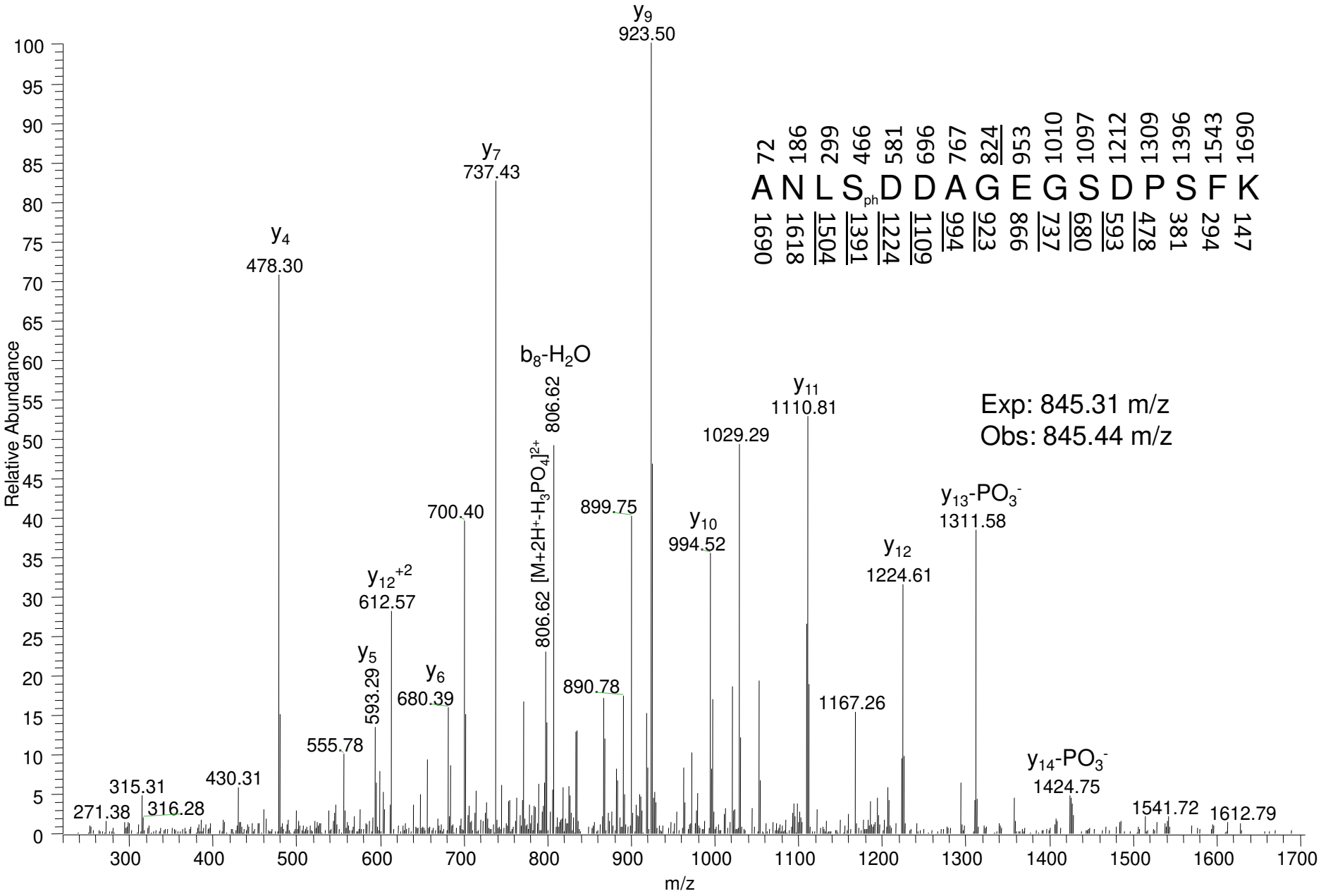

[M+2H+-H3PO4]2+
664.50
[M+2H+-H2O-H3PO4]2+
655.58
y8
807.49
808.46
y9
970.51
978.38
y10
1057.57
1066.52
b9
b10
b11
1164.50
y11
1224.57
b12
1251.55
1349.66
y4
448.32
y5
519.25
y6
633.36
695.48
y7
720.43
y2
262.33
y3
361.29
b3
369.16
340.24
503.22
254.22
880.45
863.38
961.40
88 202 369 456 619 706 793 907 978 1065 1164 1251 1426
S N S ph S Y S S N A S V S R
1426 1338 1224 1057 970 807 720 633 519 448 361 262 175
Exp: 713.17 m/z
Obs: 713.25 m/z
Relative Abundance
m/z
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400

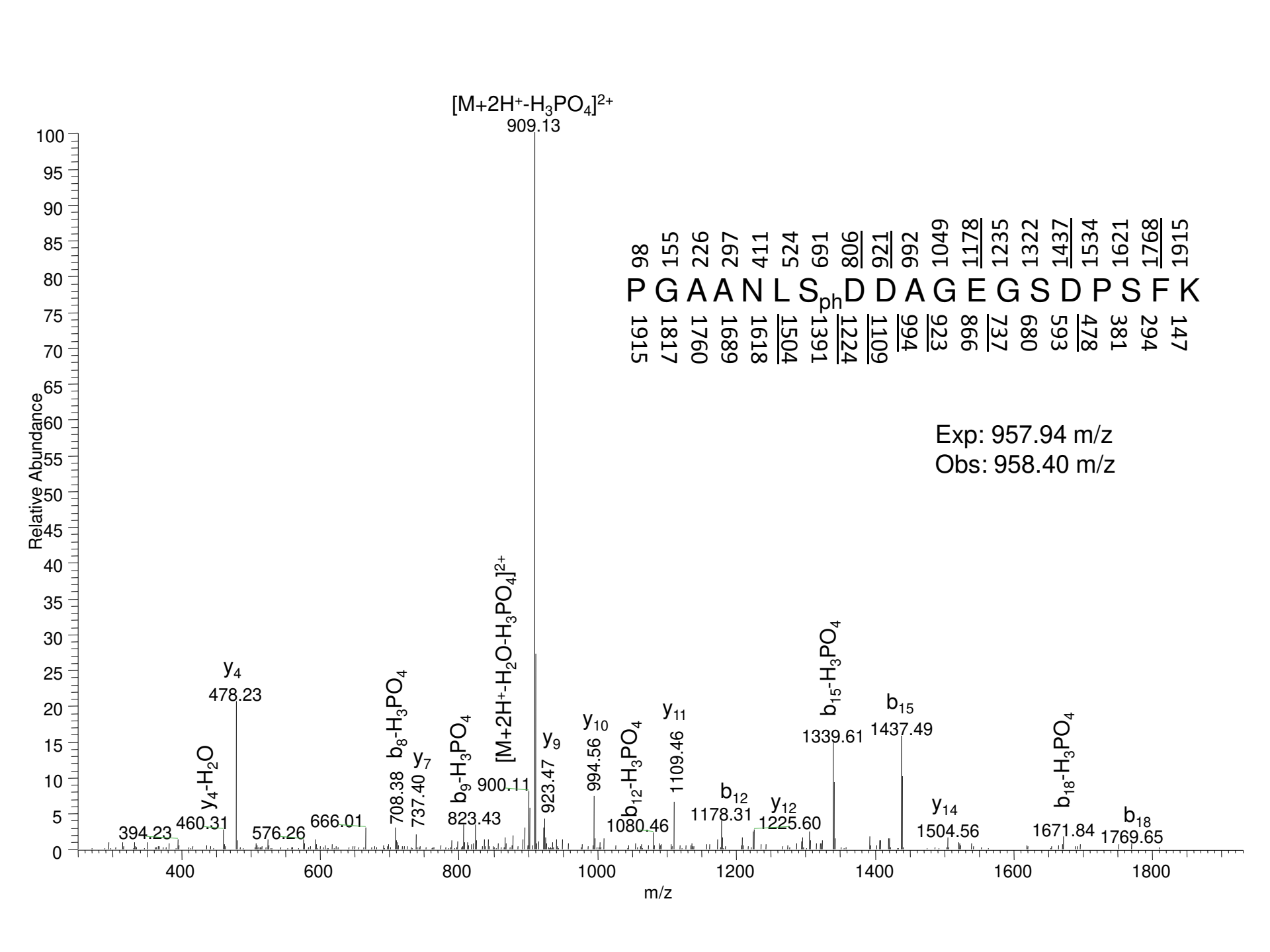

[M+2H+-H3PO4]2+
664.49
[M+2H+-H2O-H3PO4]2+
655.81
Relative Abundance
m/z
SNSSYSSNASphVSR
88 202 289 376 539 626 713 827 898 1065 1164 1251 1426
1426 1338 1224 1137 1050 887 800 713 599 528 361 262 175
Exp: 713.17 m/z
Obs: 713.26 m/z
y8
887.52
b8–H2O
695.53
y7
800.43
888.55
y9
1050.46
y10
1137.57
y11
1224.69
y2
262.23
b4–H2O
358.24
y4-H3PO4
430.40
b5–H2O
521.23
y4
528.07
y5
599.34
704.27
704.88
553.87
789.49
751.34
b9
898.47
952.61
1032.58
1127.59
1067.58
1188.44
1344.82
244.07
313.41
494.16

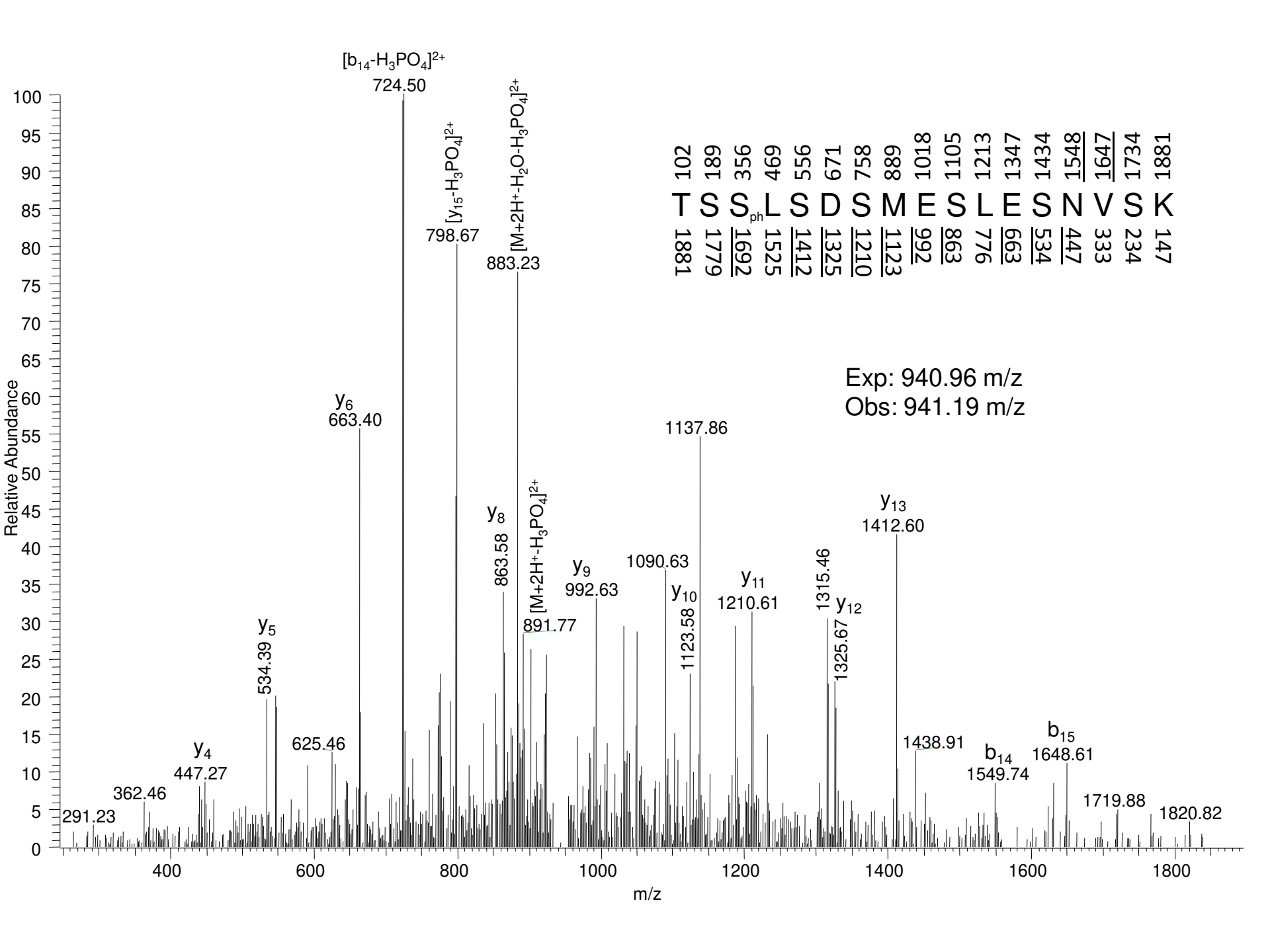

[M+2H+-H3PO4]2+
1029.23
[M+2H+-H2O-H3PO4]2+
1020.29
y15
1375.55
Exp: 1078.02 m/z
Obs: 1078.20 m/z
1060.55
b6-H3PO4
682.38
b6
780.37
y9
852.23
b10-H3PO4
978.47
b12-H3PO4
b12
1303.67
b14-H3PO4
1407.73
b14
1505.67
y16
1531.69
b15
1620.71
y17
1645.73
b16
1691.75
y5
464.07
y12
1150.46
1205.63
y18
1761.76
1763.03
412.20
508.37
632.35
1924.85
115 282 395 510 624 780 877 934 1005 1076 1190 1303 1390 1505 1620 1691 1748 1877 1934 2021 2155
N S(ph) L D N R P G A A N L S D D A G E G S D
2155 2040 1873 1760 1645 1531 1375 1278 1221 1150 1079 996 852 795 650 535 464 407 278 221 134
Relative Abundance
m/z
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
400 600 800 1000 1200 1400 1600 1800 2000

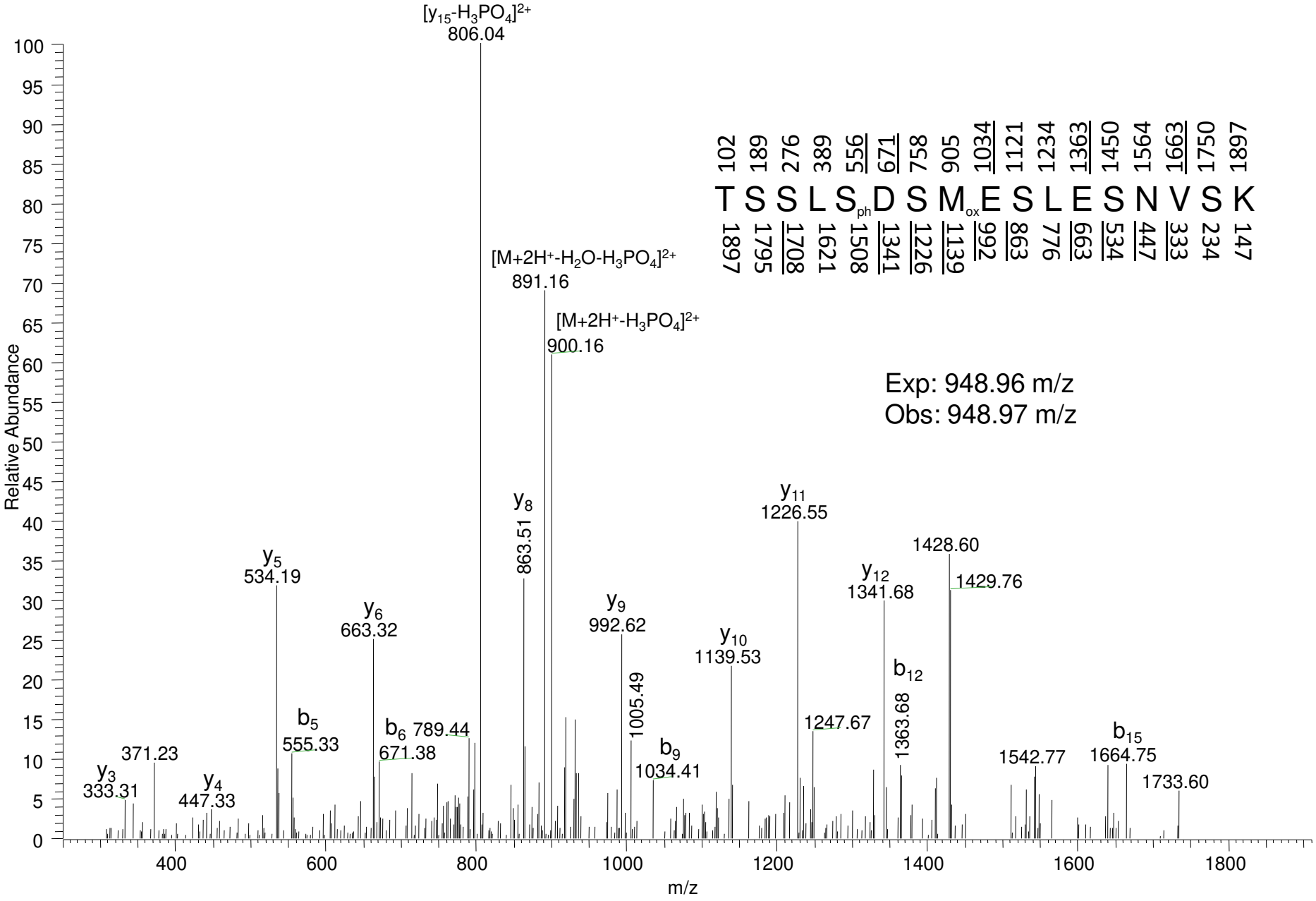

[M+2H+-H3PO4]2+
x5
x5
1258.85
N S(ph) L D N R P G A A N L S D D A G E G S D P S F K
115 282 395 510 624 780 877 934 1005 1076 1190 1303 1390 1505 1620 1691 1748 1877 1934 2021 2136 2233 2320 2467 2614
2614 2499 2332 2219 2104 1990 1834 1737 1680 1609 1538 1424 1311 1224 1109 994 923 866 737 680 593 478 381 294 147
Relative Abundance
m/z
Exp: 1307.80 m/z
Obs: 1307.67 m/z
y4 478.33
y21+2 1053.24
y11 1109.56
y23+2 1167.28
y24+2 1250.17
y10 994.50
b6-H3PO4 682.42
y7 737.40
b6 780.36
b10-H3PO4 978.67
b11-H3PO4 1092.73
b14-H3PO4 1407.68
b14 1505.78
b15-H3PO4 1522.70
b15 1620.67
b18-H3PO4 1779.88
y19 1834.83
460.41
479.89
856.56
1370.60
1724.91
1857.00
1890.04

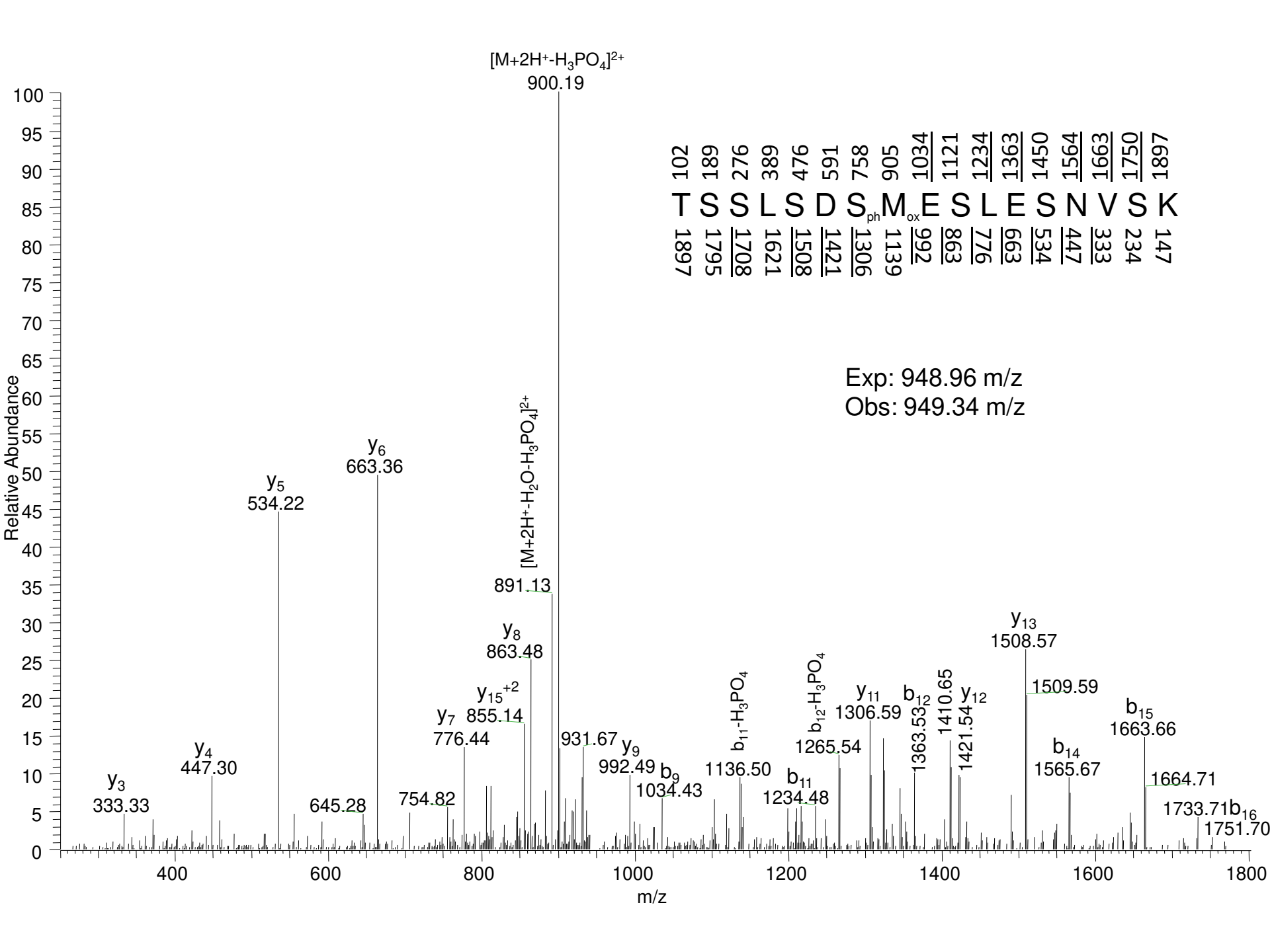

x5
x5
[M+2H+-2H3PO4]2+
[M+2H+-H3PO4]2+
1249.99
1298.91
N S(ph) L D N R P G A A N L S(ph) D D A G E G S D P S F K
115 282 395 510 624 780 877 934 1005 1076 1190 1303 1470 1585 1700 1771 1828 1957 2014 2101 2216 2313 2400 2547 2694
2694 2579 2412 2299 2184 2070 1914 1817 1760 1689 1618 1504 1391 1224 1109 994 923 866 737 680 593 478 381 294 147
Exp: 1347.28 m/z
Obs: 1347.91 m/z
Relative Abundance
m/z
y4 478.29
y4-H2O 460.32
392.28
558.30
b6-H3PO4 682.37
y7 737.50
b6 780.42
848.50
y9 923.60
y10 994.68
[y21-H3PO4]+2 1044.36
b11-H3PO4 1093.22
y11 1109.58
1158.51
1206.99 y23+2
1241.07 [y24-H3PO4]+2
1290.02 y24+2
1389.85 y13
1406.71 y14-H3PO4
b14-H3PO4 1487.86
y14
b14 1585.84
1602.83 b15-H3PO4
b15 1700.79
b16 1771.82
y18 1817.05
y19 1915.99
b18 1959.16

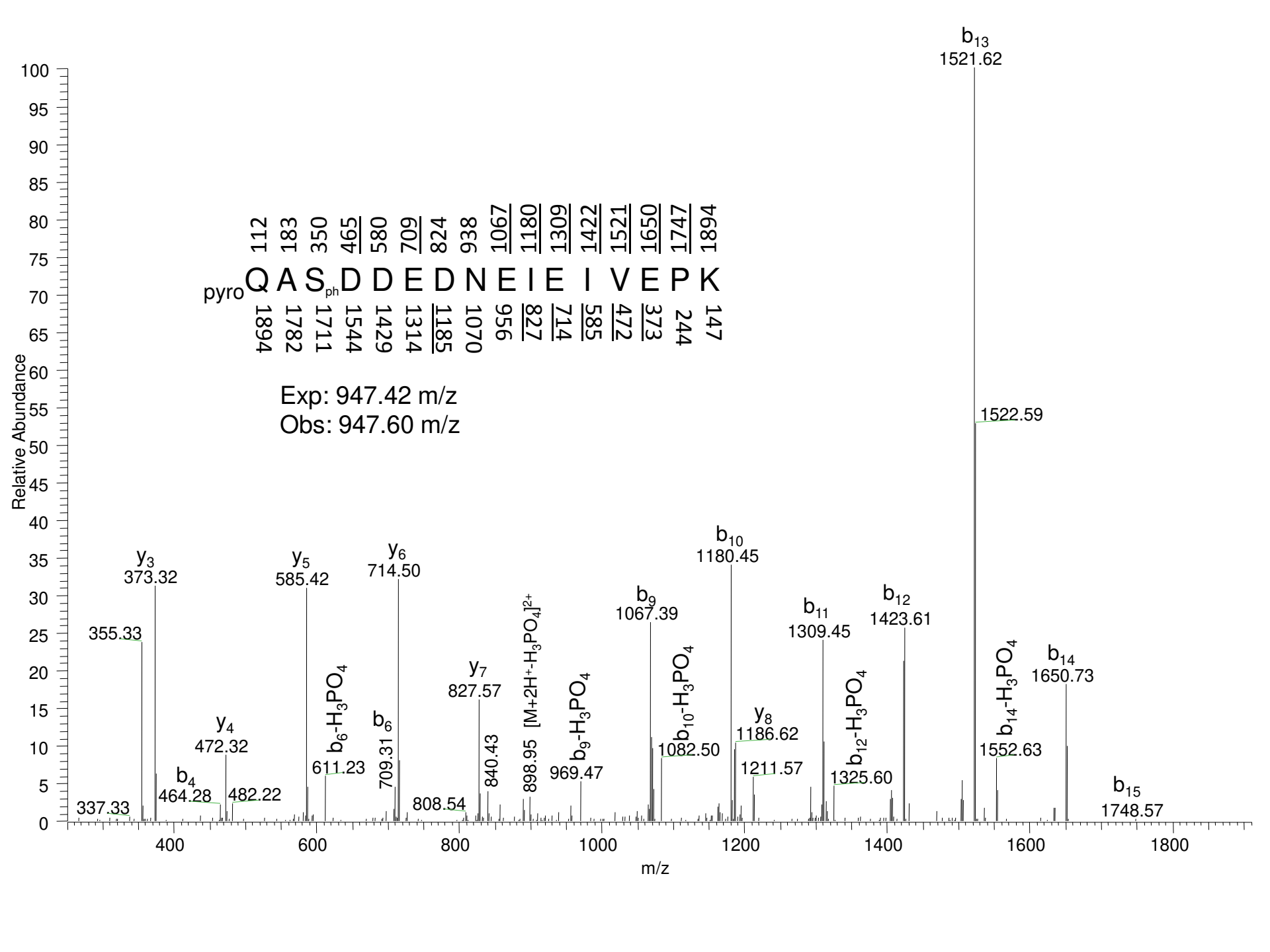

y9
923.50
y7
737.43
y4
478.30
b8-H2O
806.62 [M+2H+-H3PO4]2+
806.62
y11
1110.81
1029.29
Exp: 845.31 m/z
Obs: 845.44 m/z
y13-PO3-
1311.58
y10
994.52
y12
1224.61
899.75
700.40
y12+2
612.57
y5
593.29
y6
680.39
890.78
1167.26
555.78
430.31
315.31
316.28
271.38
y14-PO3-
1424.75
1541.72
1612.79
72 186 299 466 581 696 767 824 953 1010 1097 1212 1309 1396 1543 1690
A N L S(ph) D D A G E G S D P S F K
1690 1618 1504 1391 1224 1109 994 923 866 737 680 593 478 381 294 147
Relative Abundance
m/z
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700

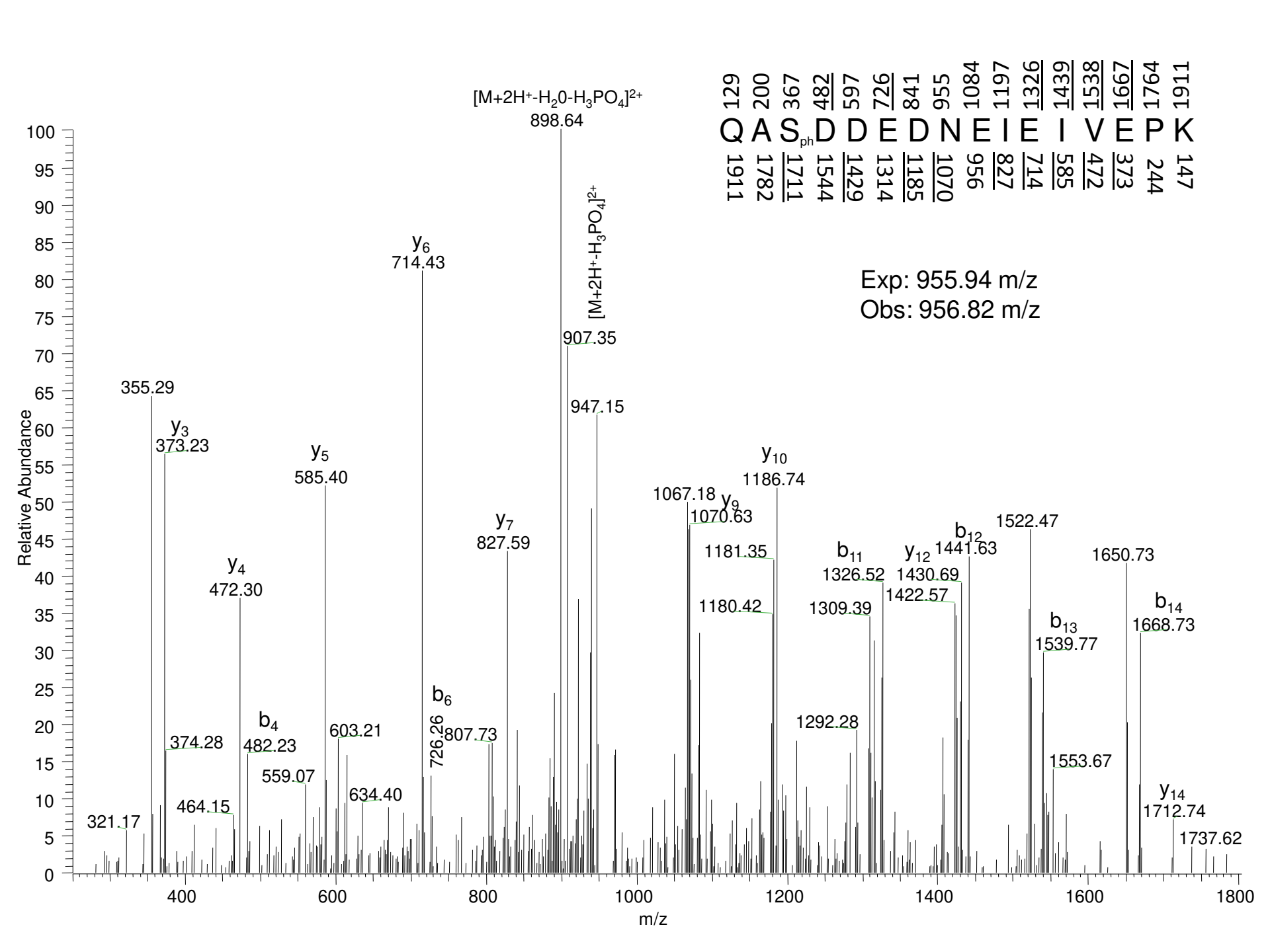

[M+2H+-H3PO4]2+
909.13
Relative Abundance
m/z
PGAANLSphDDAGEGSDPSFK
Exp: 957.94 m/z
Obs: 958.40 m/z
y4
478.23
y4-H2O
460.31
394.23
576.26
666.01
b8-H3PO4
708.38
y7
737.40
b9-H3PO4
823.43
[M+2H+-H2O-H3PO4]2+
900.11
y9
923.47
y10
994.56
b12-H3PO4
1080.46
y11
1109.46
b12
1178.31
y12
1225.60
b15-H3PO4
1339.61
b15
1437.49
y14
1504.56
b18-H3PO4
1671.84
b18
1769.65

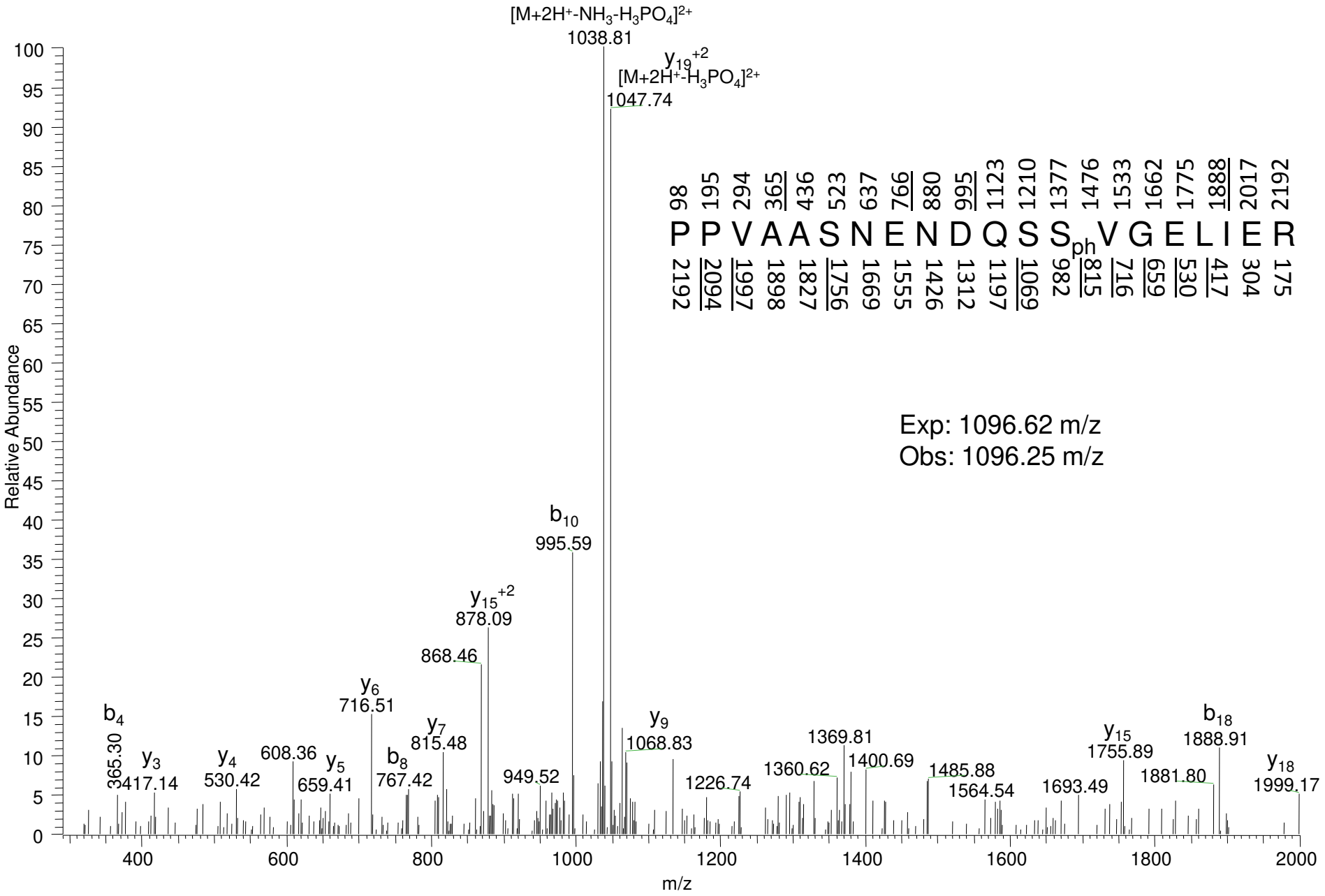

[b14-H3PO4]2+
724.50
[y15-H3PO4]2+
798.67
[M+2H+-H2O-H3PO4]2+
883.23
[M+2H+-H3PO4]2+
891.77
y6
663.40
y8
863.58
y9
992.63
1090.63
y10
1123.58
1137.86
y11
1210.61
y12
1315.46
1325.67
y13
1412.60
y5
534.39
y4
447.27
625.46
362.46
291.23
1438.91
b14
1549.74
b15
1648.61
1719.88
1820.82
102 189 356 469 556 671 758 889 1018 1105 1213 1347 1434 1548 1647 1734 1881
T S Sph L S D S M E S L E S N V S K
1881 1779 1692 1525 1412 1325 1210 1123 992 863 776 663 534 447 333 234 147
Exp: 940.96 m/z
Obs: 941.19 m/z
Relative Abundance
m/z
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
400 600 800 1000 1200 1400 1600 1800

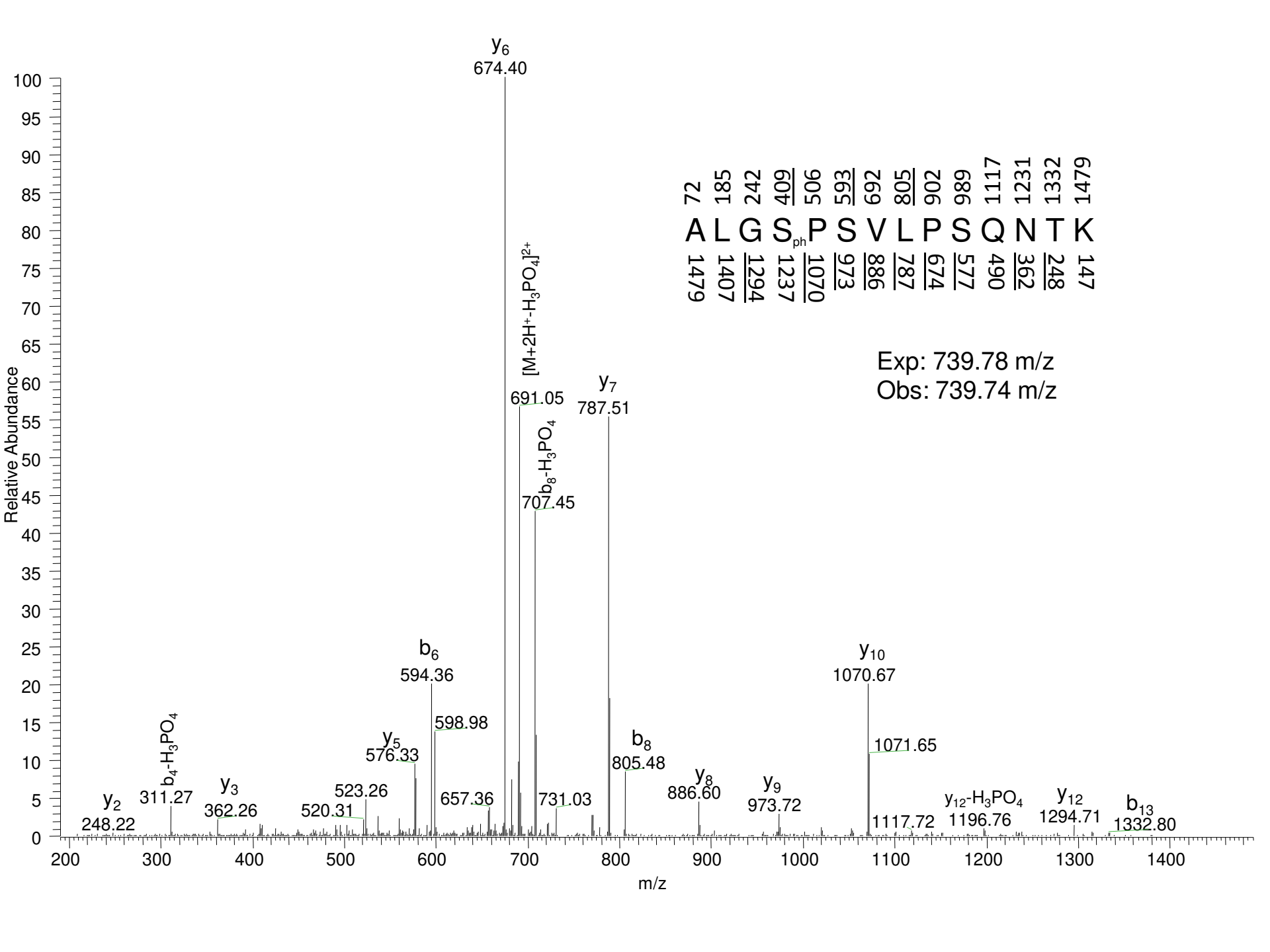

[y15-H3PO4]2+
806.04
[M+2H+-H2O-H3PO4]2+
891.16
[M+2H+-H3PO4]2+
900.16
y8
863.51
y5
534.19
y6
663.32
y9
992.62
y10
1139.53
y11
1226.55
y12
1341.68
1428.60
1429.76
b5
555.33
b6
671.38
789.44
1005.49
b9
1034.41
b12
1363.68
1247.67
b15
1664.75
1542.77
1733.60
371.23
y3
333.31
y4
447.33
102 189 276 389 556 671 758 905 1034 1121 1234 1363 1450 1564 1663 1750 1897
T S S L S(ph) D S M(ox) E S L E S N V S K
1897 1795 1708 1621 1508 1341 1226 1139 992 893 776 663 534 447 333 234 147
Exp: 948.96 m/z
Obs: 948.97 m/z
Relative Abundance
m/z
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
400
600
800
1000
1200
1400
1600
1800


[M+2H+-H3PO4]2+
900.19
TSSLSDSphMoxESLESNVSK
102 189 276 389 476 591 758 905 1034 1121 1234 1363 1450 1564 1663 1750 1897
1897 1795 1708 1621 1508 1421 1306 1139 992 893 776 693 534 447 333 234 147
Exp: 948.96 m/z
Obs: 949.34 m/z
Relative Abundance
m/z
y6 663.36
y5 534.22
[M+2H+-H2O-H3PO4]2+
891.13
y8 863.48
y15+2 855.14
y7 776.44
y4 447.30
y3 333.33
645.28
754.82
931.67
y9 992.49
b9 1034.43
b11-H3PO4 1136.50
b11 1234.48
b12-H3PO4 1265.54
y11 1306.59
b12 1363.53
y12 1410.65
1421.54
y13 1508.57
1509.59
b14 1565.67
b15 1663.66
1664.71
1733.71
b16 1751.70


pyroQASphDDEDNEIEIVEPK
112 183 350 465 580 709 824 938 1067 1180 1309 1422 1521 1650 1747 1894
1894 1782 1711 1544 1429 1314 1185 1070 956 827 714 585 472 373 244 147
Exp: 947.42 m/z
Obs: 947.60 m/z
Relative Abundance
m/z
b13 1521.62
1522.59
y3 373.32
y5 585.42
y6 714.50
b10 1180.45
b9 1067.39
b11 1309.45
b12 1423.61
b14 1650.73
355.33
y4 472.32
b4 464.28
482.22
337.33
b6-H3PO4
611.23
b6 709.31
y7 827.57
840.43
808.54
[M+2H+-H3PO4]2+ 898.95
b9-H3PO4 969.47
b10-H3PO4 1082.50
y8 1186.62
1211.57
b12-H3PO4 1325.60
b14-H3PO4 1552.63
b15 1748.57


Q A S$_{ph}$ D D E D N E I E I V E P K
129 200 367 482 597 726 841 955 1084 1197 1326 1439 1538 1667 1764 1911
1911 1782 1711 1544 1429 1314 1185 1070 956 827 714 585 472 373 244 147
[M+2H+-H20-H3PO4]2+
898.64
[M+2H+-H3PO4]2+
907.35
y6
714.43
947.15
355.29
y3
373.23
y5
585.40
y10
1186.74
1067.18
y9
1070.63
y7
827.59
1181.35
b11
1326.52
y12
1430.69
b12
1441.63
1522.47
1650.73
y4
472.30
1180.42
1309.39
1422.57
b14
1668.73
b13
1539.77
b6
726.26
807.73
b4
482.23
374.28
603.21
1292.28
559.07
1553.67
464.15
634.40
y14
1712.74
321.17
1737.62
Exp: 955.94 m/z
Obs: 956.82 m/z
Relative Abundance
m/z
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
400
600
800
1000
1200
1400
1600
1800


[M+2H+-NH3-H3PO4]2+
1038.81
y19+2
[M+2H+-H3PO4]2+
1047.74
PPVAASNENDQSSphVGELIER
Exp: 1096.62 m/z
Obs: 1096.25 m/z
b10
995.59
y15+2
878.09
868.46
y6
716.51
y7
815.48
b4
365.30
y3
417.14
y4
530.42
608.36
y5
659.41
b8
767.42
949.52
y9
1068.83
1226.74
1360.62
1369.81
1400.69
1485.88
1564.54
1693.49
y15
1755.89
1881.80
b18
1888.91
y18
1999.17
Relative Abundance
m/z


y6
674.40
[M+2H+-H3PO4]2+
691.05
y7
787.51
b8-H3PO4
707.45
b6
594.36
598.98
y5
576.33
b4-H3PO4
311.27
y3
362.26
y2
248.22
523.26
520.31
657.36
731.03
b8
805.48
y8
886.60
y9
973.72
y10
1070.67
1071.65
1117.72
y12-H3PO4
1196.76
y12
1294.71
b13
1332.80
72 185 242 409 506 593 692 805 902 989 1117 1231 1332 1479
A L G S ph P S V L P S Q N T K
1479 1407 1294 1237 1070 973 886 787 674 577 490 362 248 147
Exp: 739.78 m/z
Obs: 739.74 m/z
Relative Abundance
m/z