PNAS

Supporting Information for

Dynamic investigation of hypoxia-induced L-lactylation

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This PDF file includes:

I. Supplemental figures

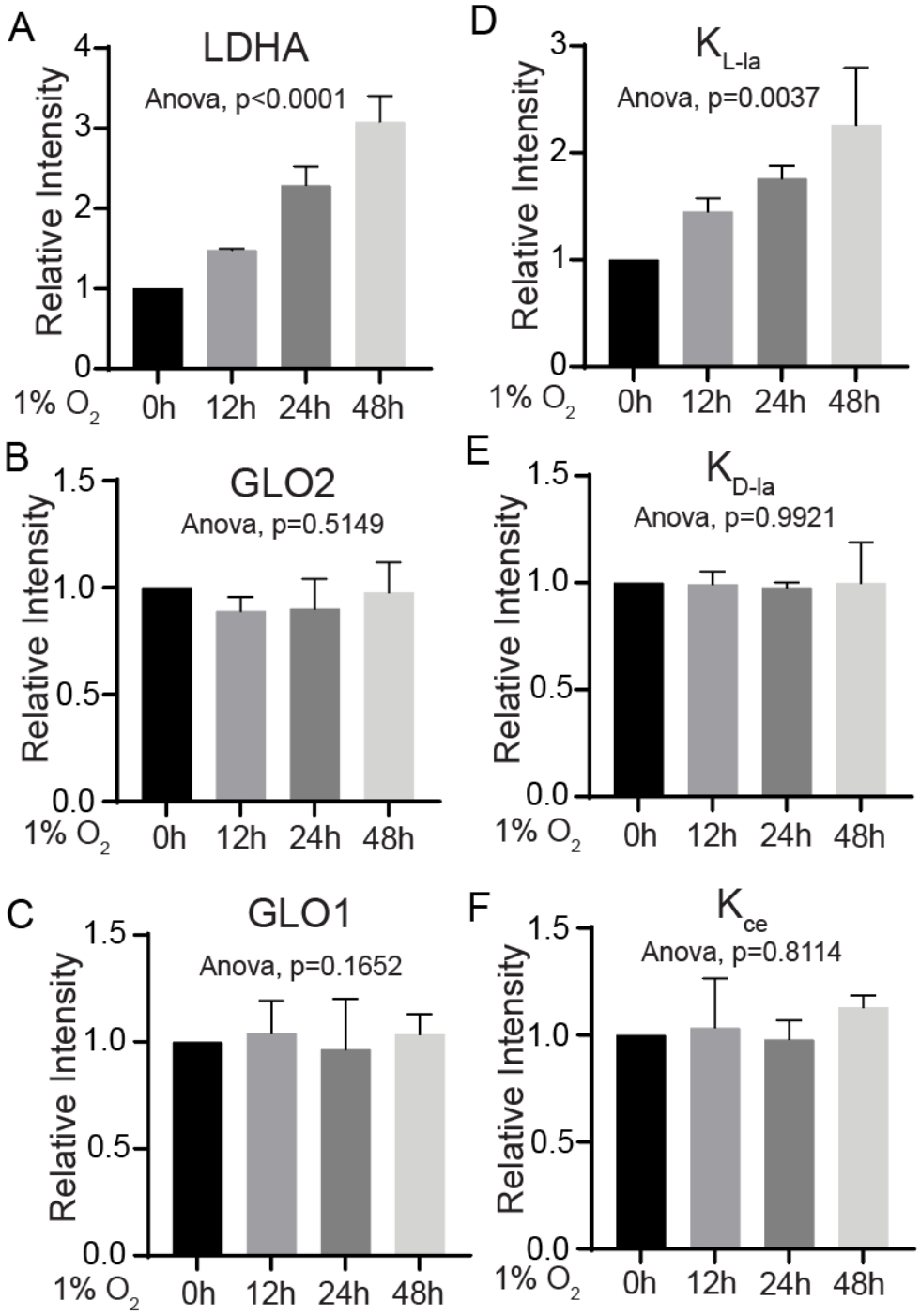


Figure S1, related to Figure 2. Hypoxia induces $K_{L\text{-}la}$, but not $K_{D\text{-}la}$ or K_{ce}, in WT cancer cells. Densitometry quantification of immunoblots for LDHA (**A**), GLO2 (**B**), and GLO1 (**C**), $K_{L\text{-}la}$ (**D**), $K_{D\text{-}la}$ (**E**), K_{ce} (**F**), normalized by the loading control. In each experiment, values were then normalized to the normoxia group. Values are the mean of three experiments. Statistical analysis was performed by one-way ANOVA.

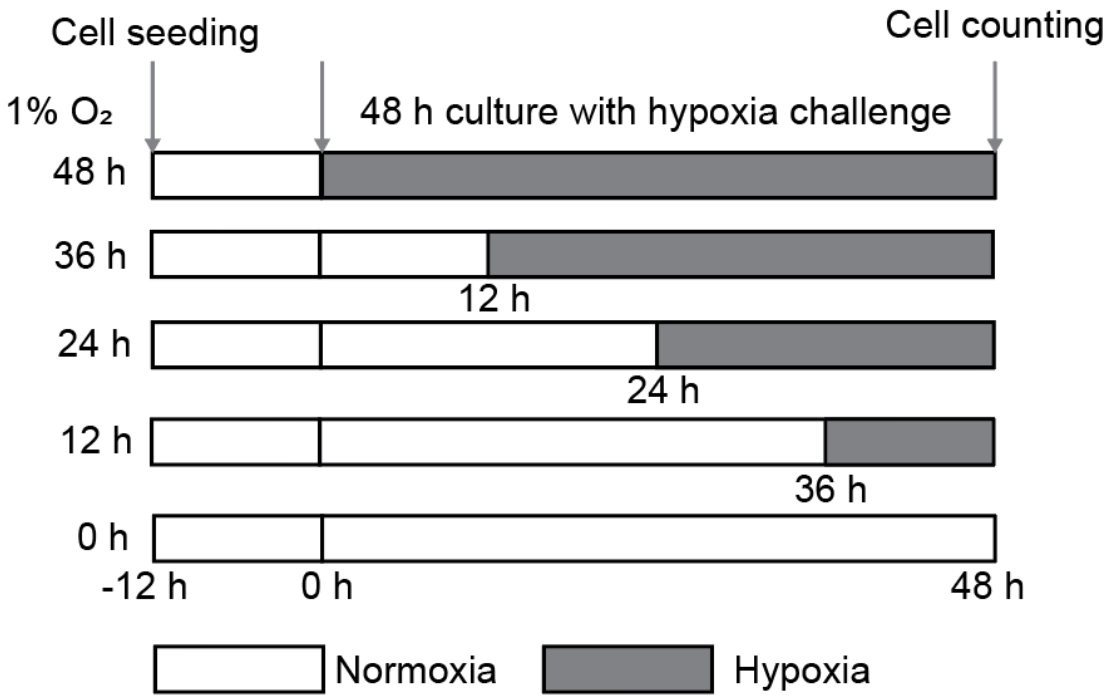


Figure S2, related to Figure 3. Schematic workflow for evaluating cell adaptability to hypoxia. For each cell line, cells were cultured for 12 h prior to hypoxia treatment. During the 48-h culture time, cells were treated with 48 h, 36 h, 24 h, 12 h, or 0 h hypoxia before measuring viability. Cell numbers were normalized to the normoxia group (0 h hypoxia) to assess hypoxia adaptation between different cell types.

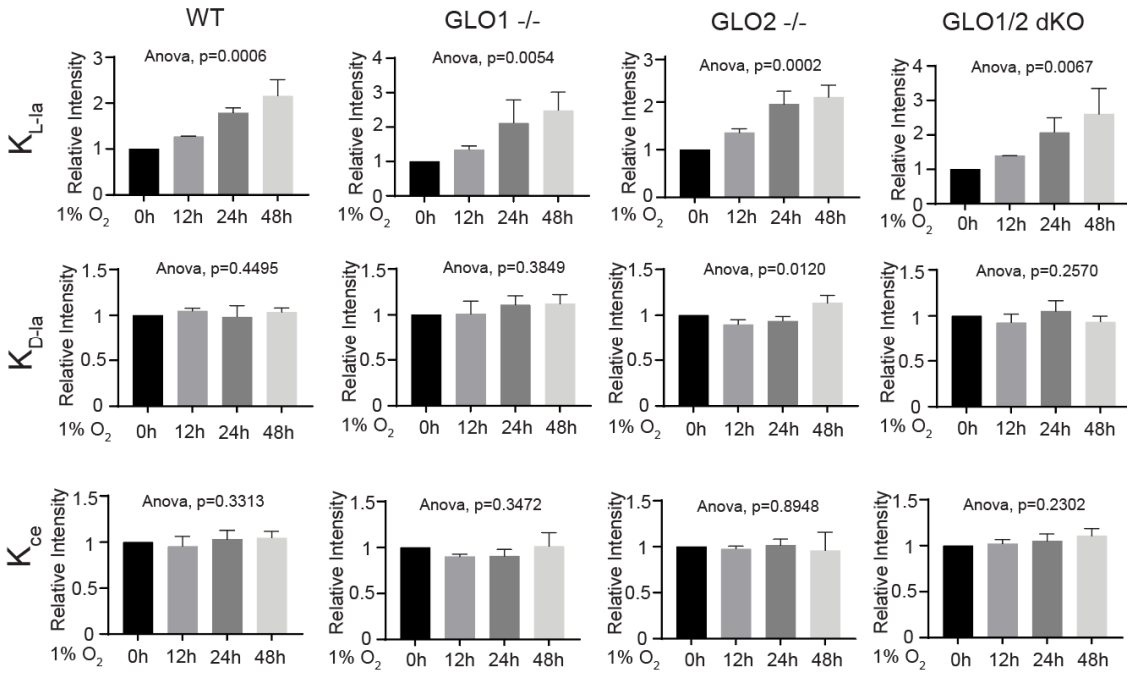


Figure S3, related to Figure 3. Hypoxia induces $K_{L\text{-}la}$, but not $K_{D\text{-}la}$ or K_{ce}, in glyoxalase-deficient cells. Densitometry quantification of immunoblots for $K_{L\text{-}la}$, $K_{D\text{-}la}$, and K_{ce}, normalized by the loading control. In each experiment, values were then normalized to the normoxia group. Values are the mean of three experiments. Statistical analysis was performed by one-way ANOVA.

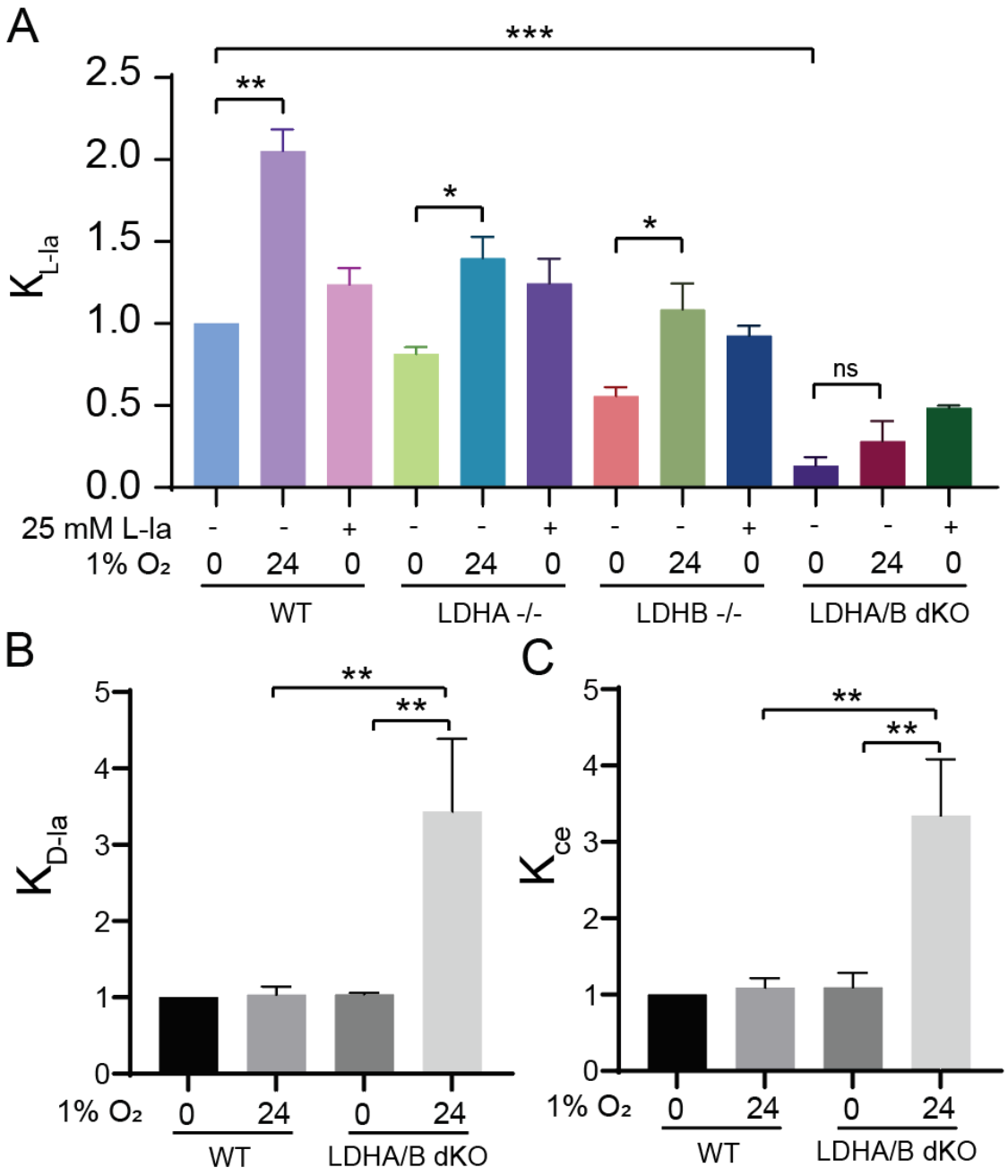


Figure S4, related to Figure 4. Hypoxia-induced $K_{L\text{-}la}$ levels in LDH-deficient cells. Densitometry quantification of immunoblots for (**A**) $K_{L\text{-}la}$, (**B**) $K_{D\text{-}la}$ and K_{ce} (**C**) was conducted and normalized by the loading control. In each experiment, values were then normalized to the control group (WT cells with no treatment). Values are the mean of two experiments for $K_{L\text{-}la}$ and three experiments for $K_{D\text{-}la}$ and K_{ce}. Statistical analysis was performed by student's t-test. *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; ns: not significant.

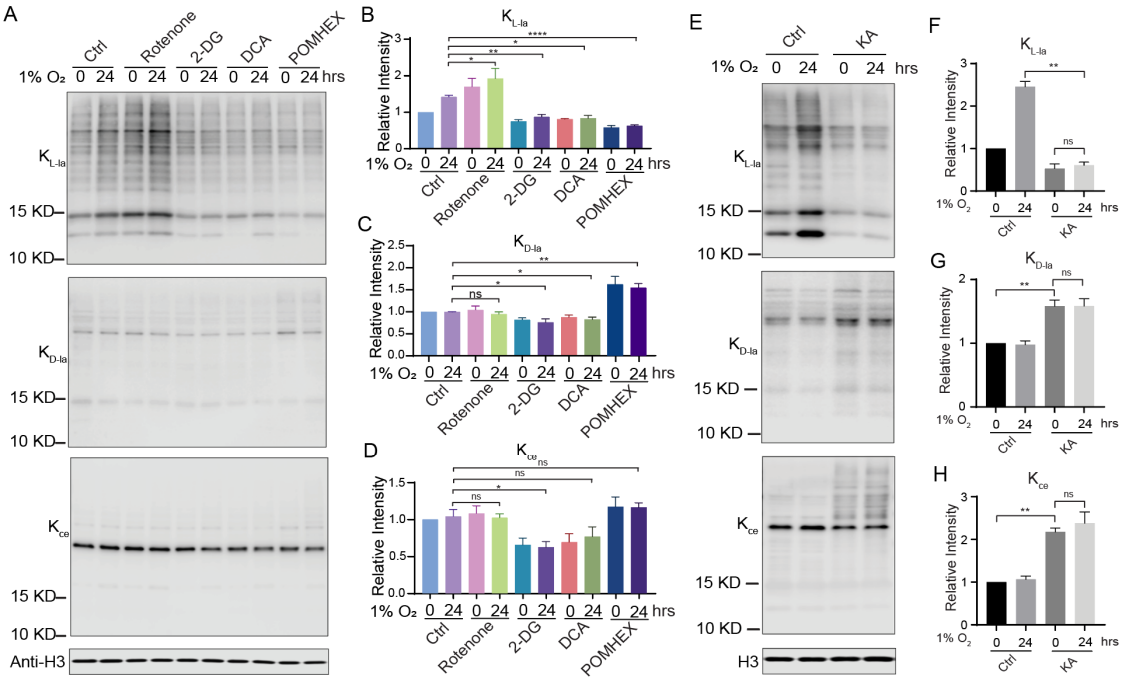


Figure S5. Modulation of glycolysis and mitochondrial respiration pathways reveals distinct hypoxia responses in $K_{L\text{-}la}$, $K_{D\text{-}la}$, and K_{ce}. (**A**) Immunoblots of whole-cell lysates of MCF-7 cells treated with hypoxia and different glycolysis modulators. (**B-D**) Densitometry quantification of immunoblots for $K_{L\text{-}la}$ (**B**), $K_{D\text{-}la}$ (**C**), and K_{ce} (**D**). (**E**) Immunoblots of whole-cell lysates of MCF-7 cells treated with hypoxia and koningic acid. (**F-H**) Densitometry quantification of immunoblots for koningic acid treatment for $K_{L\text{-}la}$ (**F**), $K_{D\text{-}la}$ (**G**), and K_{ce} (**H**). The 0h 1% O_2 treatment denotes the normoxic condition, whereas the 24h 1% O_2 treatment represents the hypoxic condition. In each experiment, quantification values were first normalized by the loading control, then normalized to the control group (WT cells with no treatment). Values are the mean of three experiments. Statistical analysis was performed by student's t-test. *: $p < 0.05$; **: $p < 0.01$; ****: $p < 0.0001$; ns: not significant.

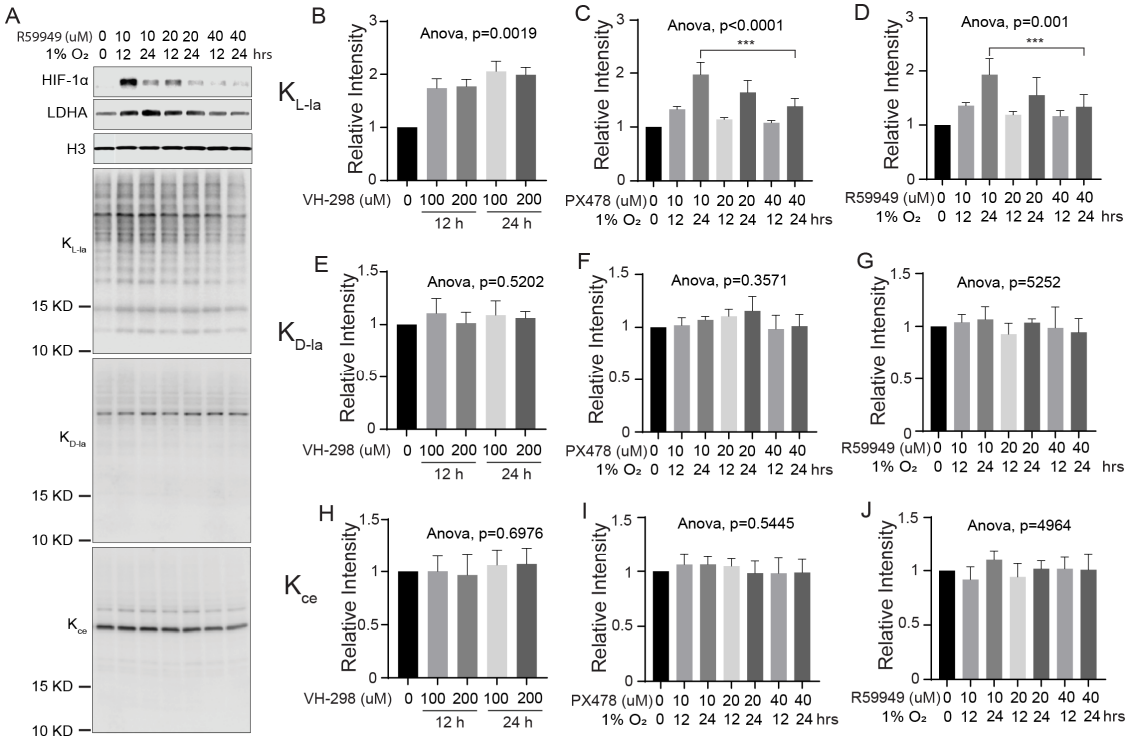


Figure S6, related to Figure 5. $K_{L\text{-}la}$ correlates with HIF-1α. (A) Immunoblots of whole-cell lysates of MCF-7 cells in response to hypoxia coupled with R59945, which inhibits HIF-1α-mediated transcription in response to hypoxia. (**B-J**) Densitometry quantification of immunoblots depicting whole-cell lysates of MCF-7 cells treated with hypoxia and different HIF-1α modulators for $K_{L\text{-}la}$ (**B-D**), $K_{D\text{-}la}$ (**E-G**), and K_{ce} (**H-J**). In each experiment, quantification values were first normalized by the loading control, then normalized to the control group (WT cells with no treatment). Values are the mean of three experiments. Statistical analysis was performed by one-way ANOVA.

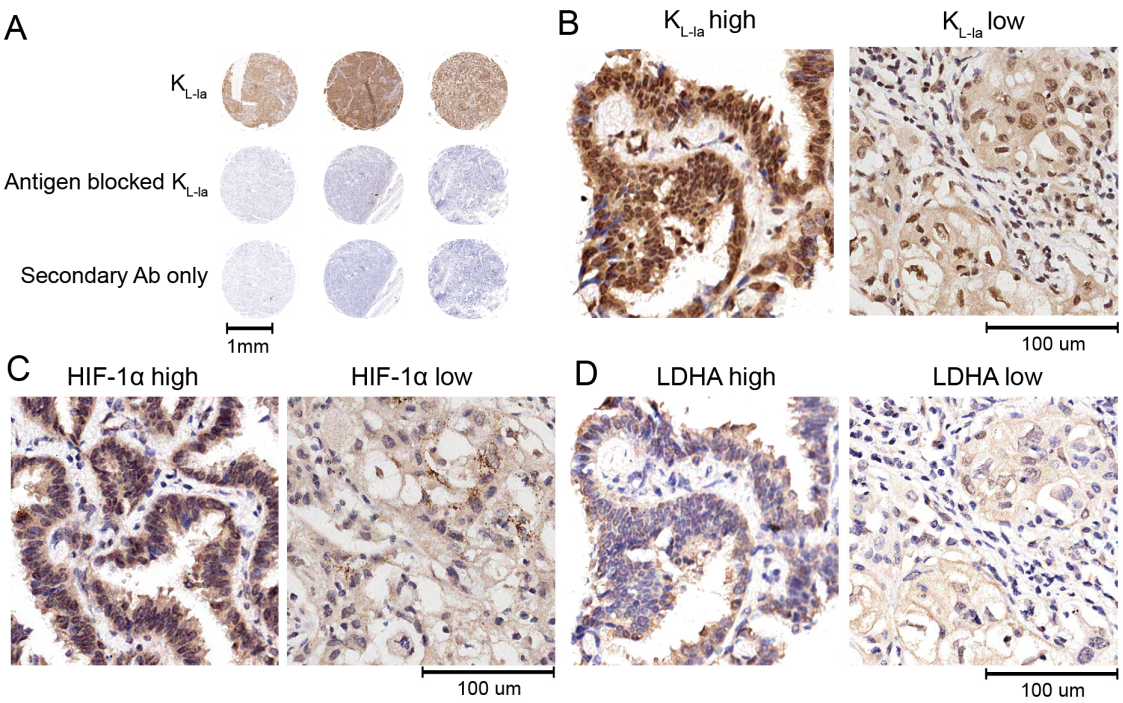


Figure S7, related to Figure 5. Quality control and zoom-in view of the IHC staining results. (**A**) Representative images from human lung adenocarcinoma tissue microarrays stained for K_{L-la} (top), and two negative controls: blocking the K_{L-la} antibody with a K_{L-la} peptide library before conducting the staining (middle), or the primary antibody was omitted, while all other procedures remained the same (bottom). (**B-D**) Zoom-in view of K_{L-la} (**B**), HIF-1α (**C**), and LDHA (**D**) staining as in Fig. 5D.

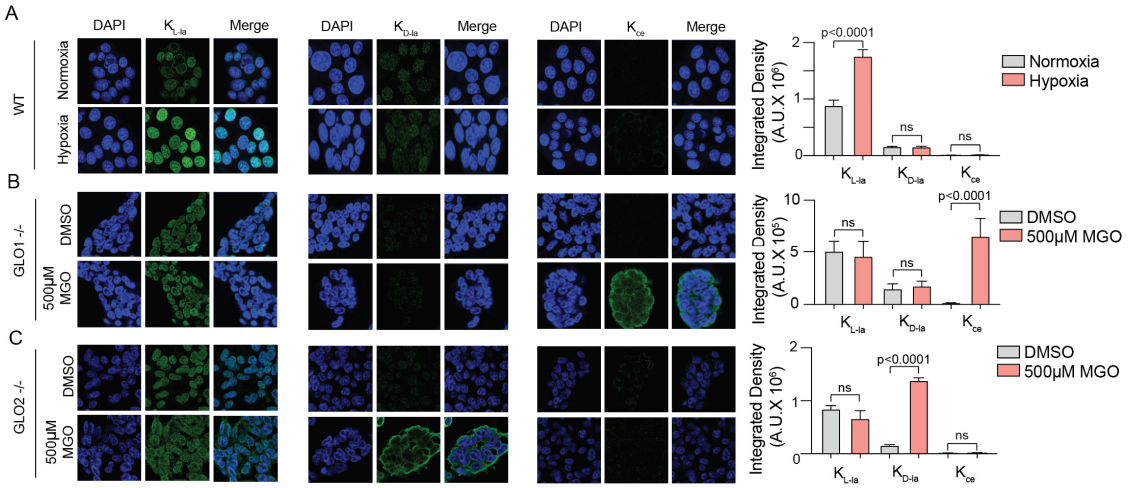


Figure S8. Subcellular localization distinguishes hypoxia-induced $K_{L\text{-}la}$ from $K_{D\text{-}la}$ and K_{ce}. (**A**) Immunofluorescence staining was conducted on WT MCF-7 cells under hypoxic and normoxic conditions with $K_{L\text{-}la}$, $K_{D\text{-}la}$, and K_{ce} antibodies. (**B-C**) Immunostaining images of HEK293T GLO1 -/- (**B**) and GLO2 -/- (**C**) cells treated with DMSO or 500 μM MGO for 6 hours. DAPI: 4',6-diamidino-2-phenylindole (nuclear stain). Statistical analysis was performed by student's t-test. ns: not significant.

A

	Detected peptide #	Quantified peptide #	Quantified site #
H1	56	31	26
H2A	14	7	7
H2B	57	45	23
H3	18	13	8
H4	21	16	3

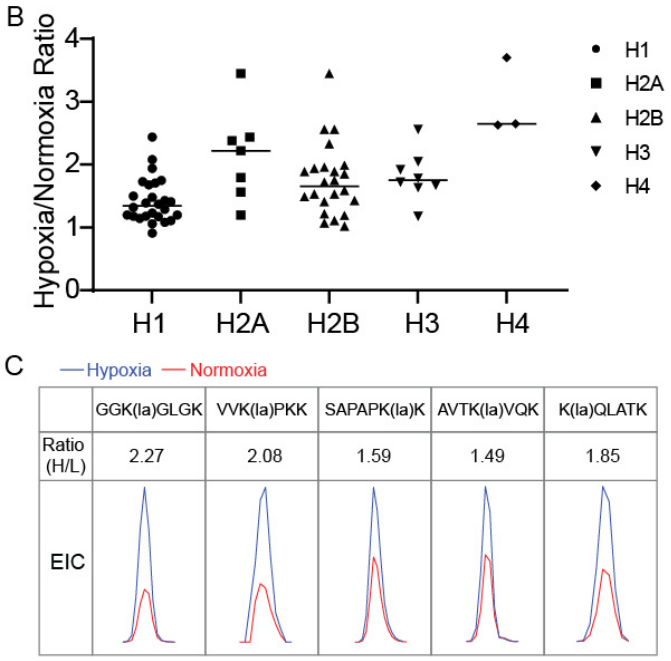


Figure S9, related to Figure 6. Hypoxia-regulated $K_{L\text{-}la}$ sites. (**A**) Statistics of proteomics results of $K_{L\text{-}la}$ peptides on histone proteins. (**B**) Distribution of hypoxia/normoxia ratios for quantified histone $K_{L\text{-}la}$ sites. The ratios are grouped by histone protein. (**C**) Ratios and chromatographs of representative $K_{L\text{-}la}$ peptides.

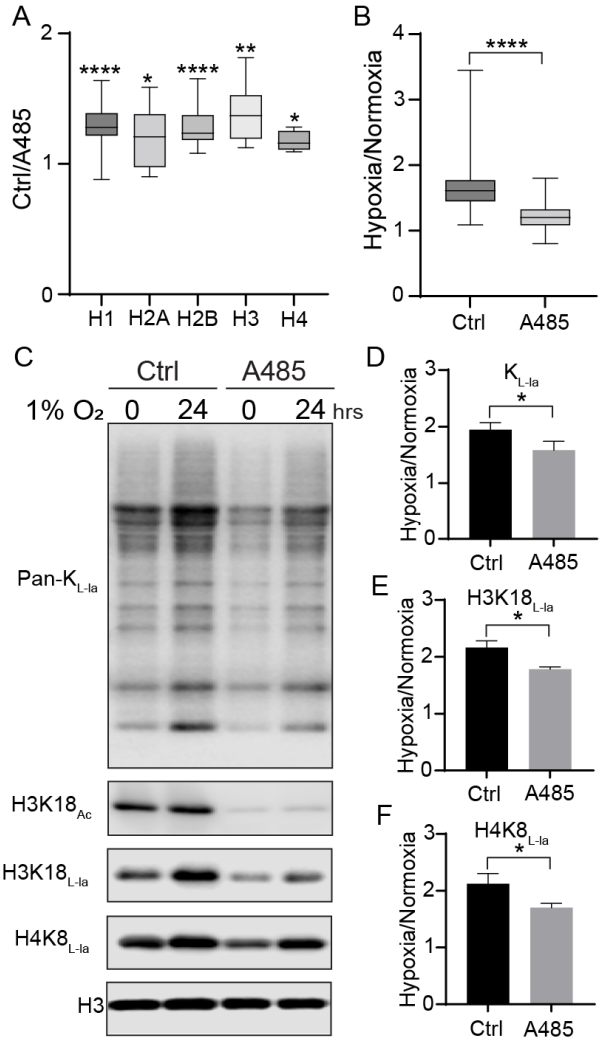


Figure S10. p300/CBP drives hypoxia-induced $K_{L\text{-}la}$. (**A**) Distribution of control/A485 ratios for quantified histone $K_{L\text{-}la}$ sites. The ratios are grouped by histone proteins. (**B**) Distribution of hypoxia/normoxia ratios for quantified histone $K_{L\text{-}la}$ sites, either treated with DMSO or 30 μM A485. (**C**) Immunoblots of whole-cell lysates of MCF-7 cells treated with hypoxia and 30 μM A485. (**D-F**) Densitometry quantification of immunoblots for $K_{L\text{-}la}$ (**D**), $H3K18_{L\text{-}la}$ (**E**), and $H4K8_{L\text{-}la}$ (**F**), normalized by the loading control. Values are the mean of three experiments. Statistical analysis was performed by student's t-test. *: $p < 0.05$; **: $p < 0.01$; ****: $p < 0.0001$.

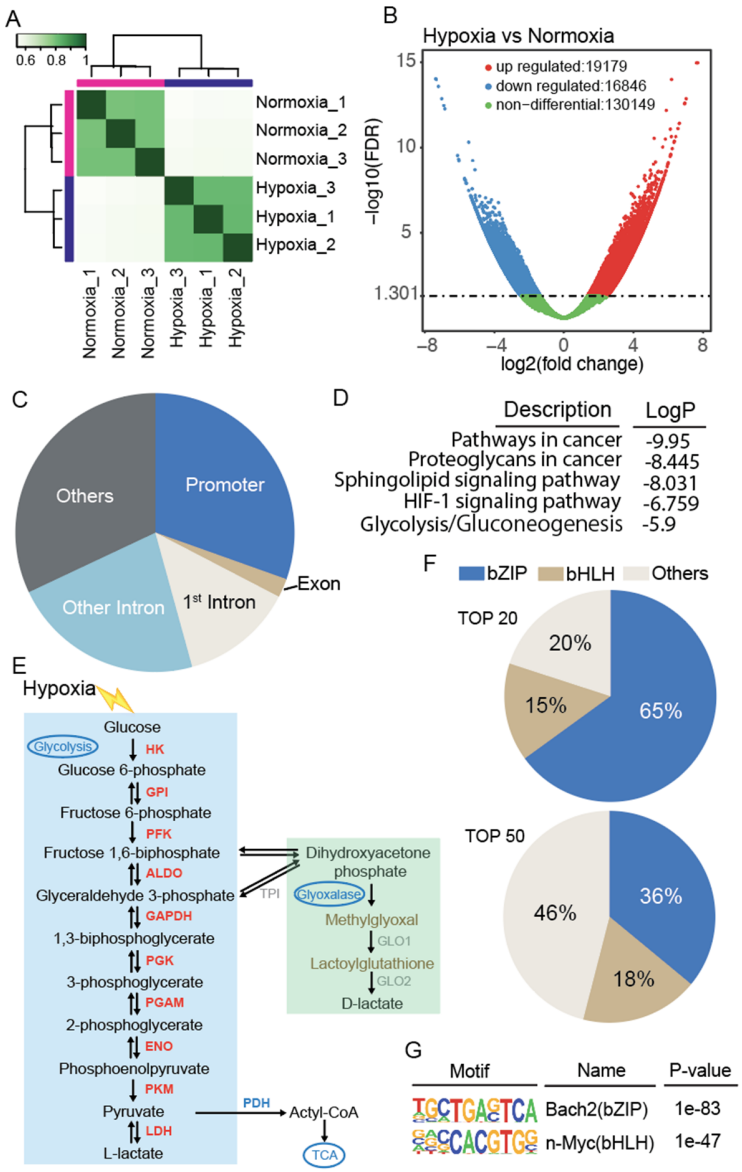


Figure S11. Hypoxia-induced $K_{L\text{-}la}$ is associated with glycolysis gene activation. (**A**) Heat-map of Pearson correlation coefficient among samples. The shade of color represents correlation coefficient. (**B**) Volcano plot illustrating differential peaks between normoxia and hypoxia groups. Each point represents a peak, with significantly upregulated genes in red and downregulated genes in blue, and non-significant genes in green. The horizontal dashed line indicates significance threshold of false-discovery rate (FDR). (**C**) Pie chat depicting the functional regions of the differential peaks. (**D**) Selected KEGG pathways associated with genes with promoters marked by hypoxia-induced H3K18$_{L\text{-}la}$. (**E**) Glycolysis and glyoxalase genes with promoters marked by H3K18$_{L\text{-}la}$. Red: hypoxia upregulated; blue: hypoxia downregulated; gray: unidentified. (**F**) HOMER motif analysis of all hypoxia-upregulated H3K18$_{L\text{-}la}$ peaks. Pie charts demonstrate the distribution of the top 20 (upper) and 50 (lower) significant motifs. (**G**) Representative motifs from bZIP and bHLH transcription factors in (**F**).

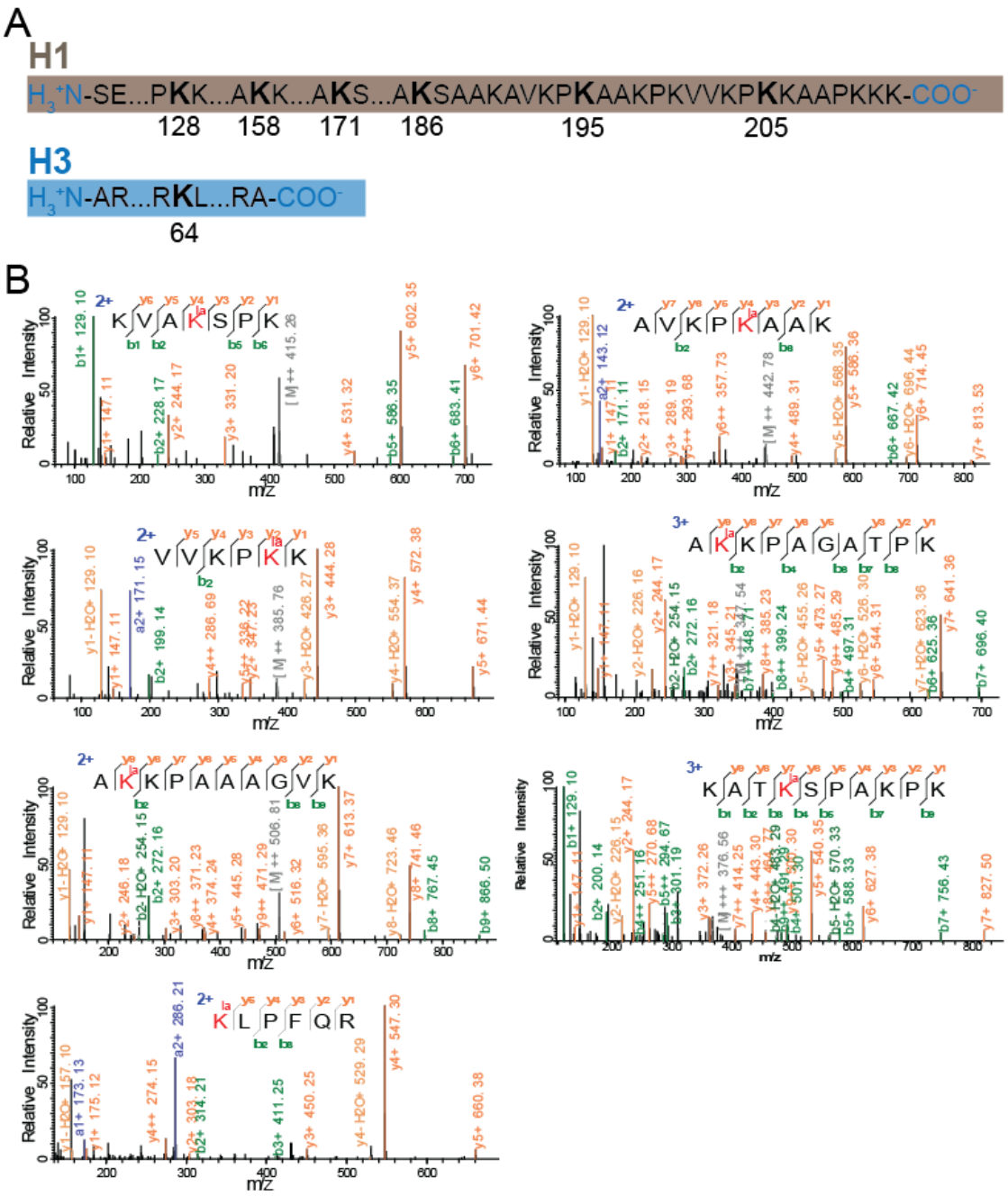


Figure S12. Newly identified histone $K_{L\text{-}la}$ marks. (**A**) Seven new histone marks were identified from the proteomics data for studying hypoxia-regulated histone $K_{L\text{-}la}$, of which six were on histone H1 and one was on histone H3. (**B**) The peptide-spectrum matches (PSMs) of these newly identified histone marks were confirmed by manual verification.

II. Supplemental tables

Table S1. Quantified hypoxia/normoxia ratios of histone $K_{L\text{-}la}$ sites.

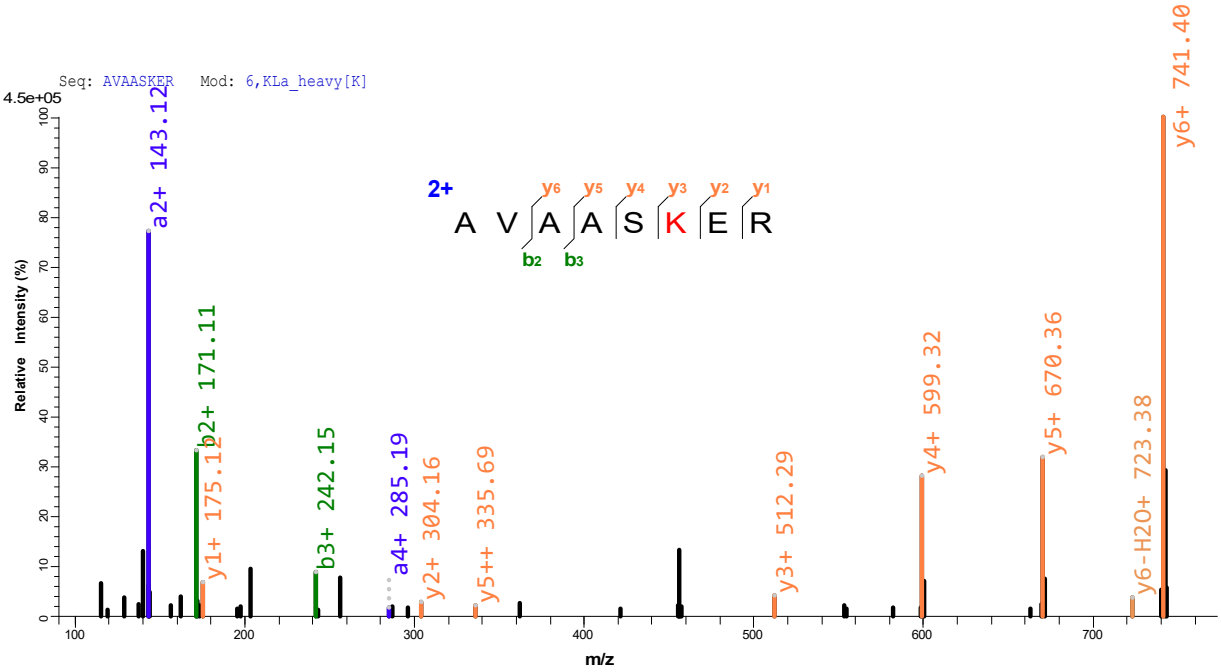
Kla Site	Hypoxia/Normoxia	Kla Site	Hypoxia/Normoxia
H1.2K33	1.75	H1.2K51	2.44
H1.2K62	1.39	H1.2K89	1.23
H1.2K96	1.2	H1.2K105	0.91
H1.2K158	1.48	H1.2K167	1.5
H1.2K171	1.15	H1.2K190	1.73
H1.2K195	1.92	H1.2K200	1.18
H1.2K205	2.08	H1.5K36	1.32
H1.5K131	1.68	H1.5K159	1.29
H1.5K167	1.18	H1.5K187	1.06
H1.5K193	1.31	H1.1K187	1.41
H1.3K140	1.2	H1.3K148	1.71
H1.3K168	1.11	H1.3K178	1.43
H1.4K158	1.17	H1.4K167	1.08
H2AK9	2.38	H2AK36	1.79
H2AK95	2.22	H2AJK9	2.44
H2AZK11	3.45	H2AZ15	1.56
H2AX127	1.2	H2B1CK5	2.56
H2B1CK11	1.89	H2B1CK12	1.89
H2B1CK15	1.94	H2B1CK16	1.96
H2B1CK20	1.53	H2B1CK23	1.19
H2B1CK85	1.07	H2B1CK108	3.45
H2B1CK116	1.49	H2B1CK120	2.33
H2B1DK5	1.59	H2B1DK11	2.56
H2B1MK5	1.43	H2B1MK11	1.75
H2B1MK15	1.41	H2B1MK16	1.72
H2B1MK20	1.53	H2B2FK5	1.85
H2B2FK11	1.11	H2B2FK15	1.22
H2B2FK16	1.99	H2B2FK20	1.02
H3K9	2.56	H3K14	1.92
H3K18	2.05	H3K23	1.72
H3K27	1.64	H3K56	1.18

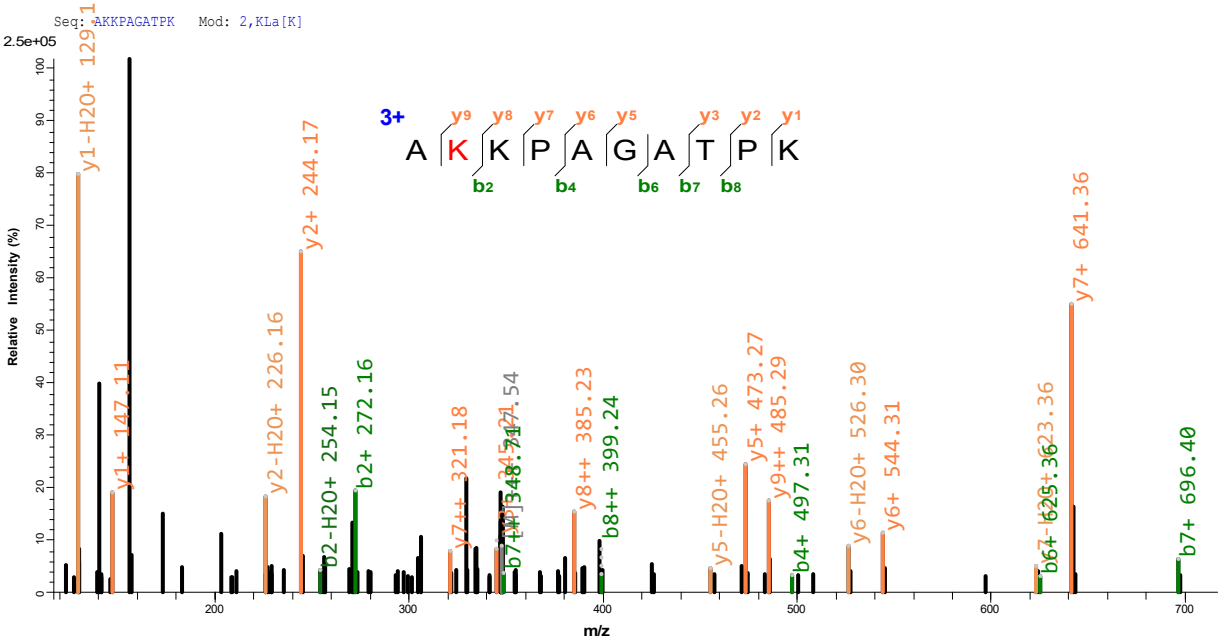
H3K79	1.67	H3K122	1.785
H4K5	3.7	H4K8	2.65
H4K12	2.63		

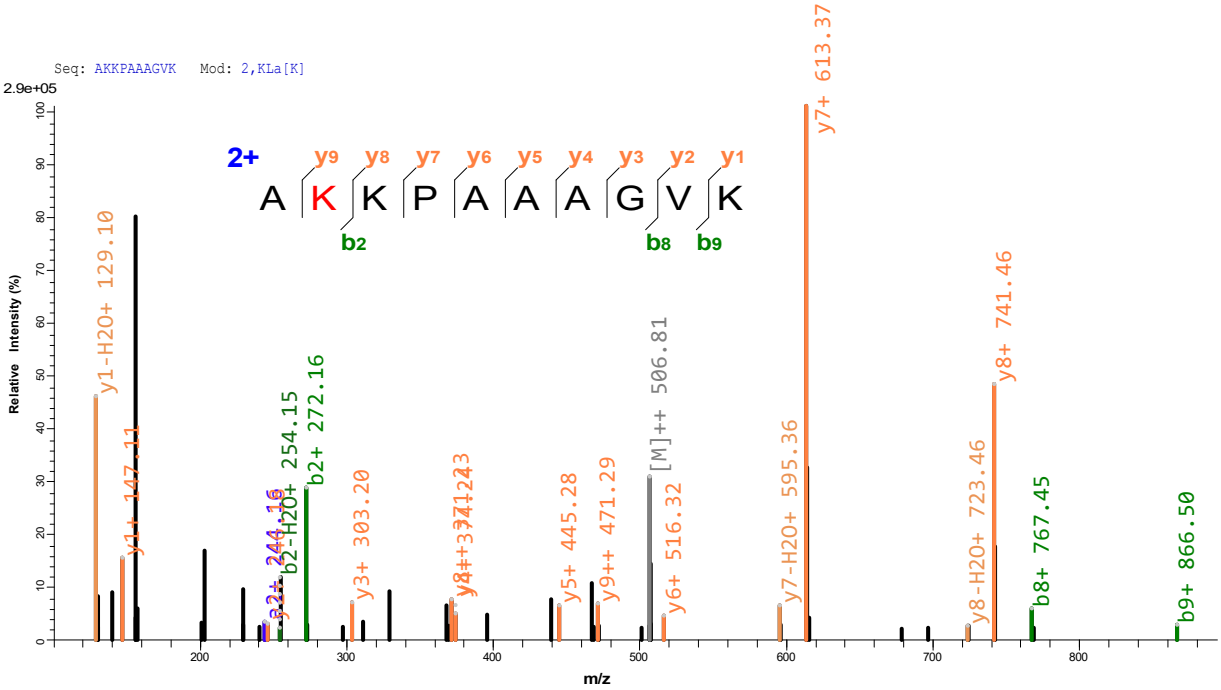
III. Supplemental data

Data S1. PSMs for quantified $K_{L\text{-}la}$ peptides

H1



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2+
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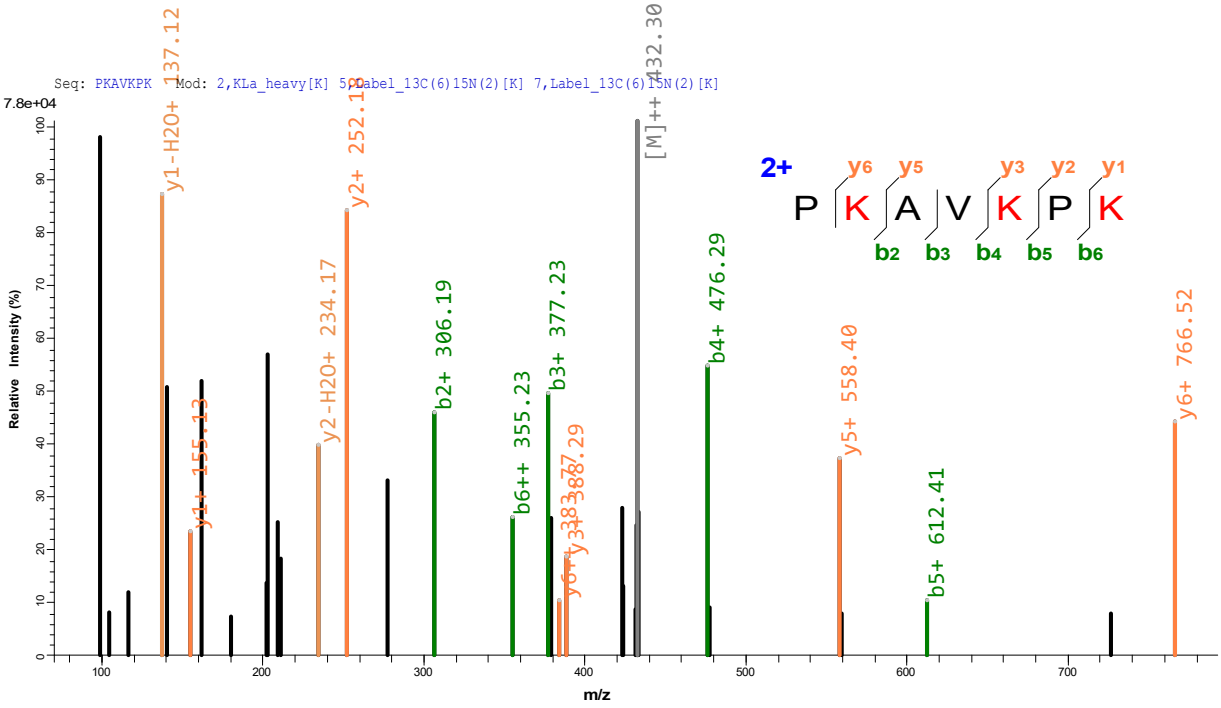
y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b8 b9
Relative Intensity (%)
m/z
y1-H2O+ 129.10
y1+ 147.11
b2+ 254.15
b2-H2O+ 272.16
y3+ 303.20
y5+ 445.28
y9++ 471.29
[M]++ 506.81
y6+ 516.32
y7+ 613.37
y7-H2O+ 595.36
y8+ 741.46
y8-H2O+ 723.46
b8+ 767.45
b9+ 866.50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2+
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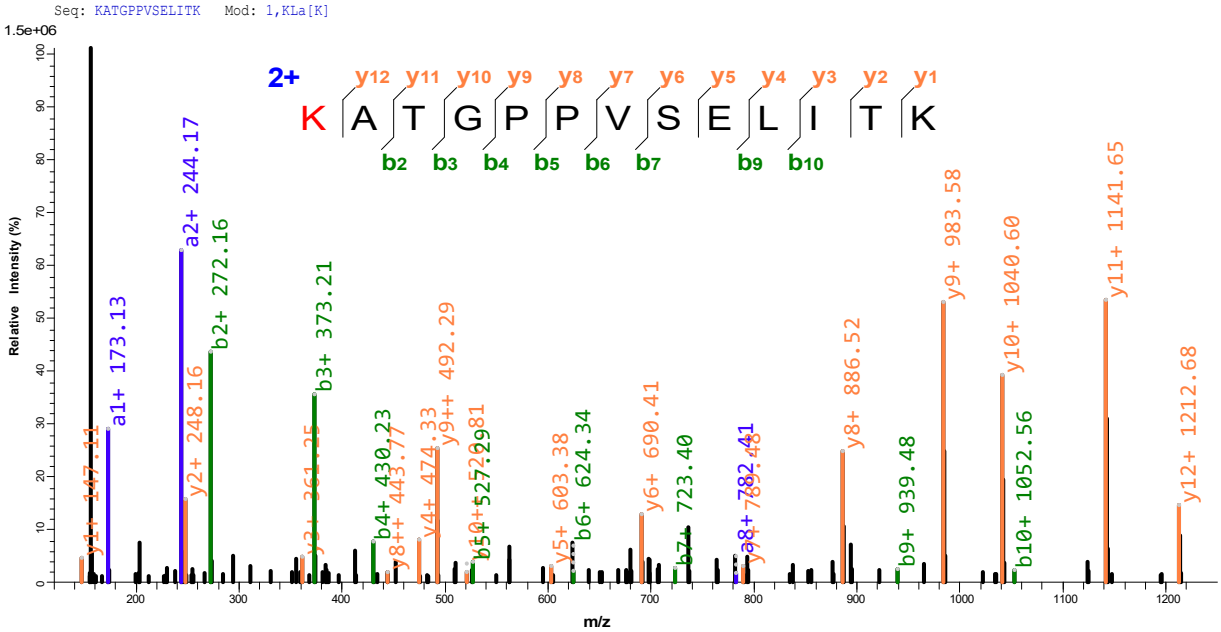
y6 y5 y3 y2 y1
b2 b3 b4 b5 b6
Relative Intensity (%)
m/z
y1-H2O+ 137.12
y1+ 155.13
y2-H2O+ 234.17
y2+ 252.18
b2+ 306.19
b6++ 355.23
b3+ 377.23
[M]++ 432.30
b4+ 476.29
y5+ 558.40
b5+ 612.41
y6+ 766.52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a1+ 173.13
a2+ 244.17
b2+ 272.16
y2+ 248.16
b3+ 373.21
b4+ 430.23
y8++ 443.77
y4+ 474.33
y9++ 492.29
b5+ 527.29
y5+ 603.38
b6+ 624.34
y6+ 690.41
b7+ 723.40
y8+ 782.41
y7+ 781.48
y8+ 886.52
b9+ 939.48
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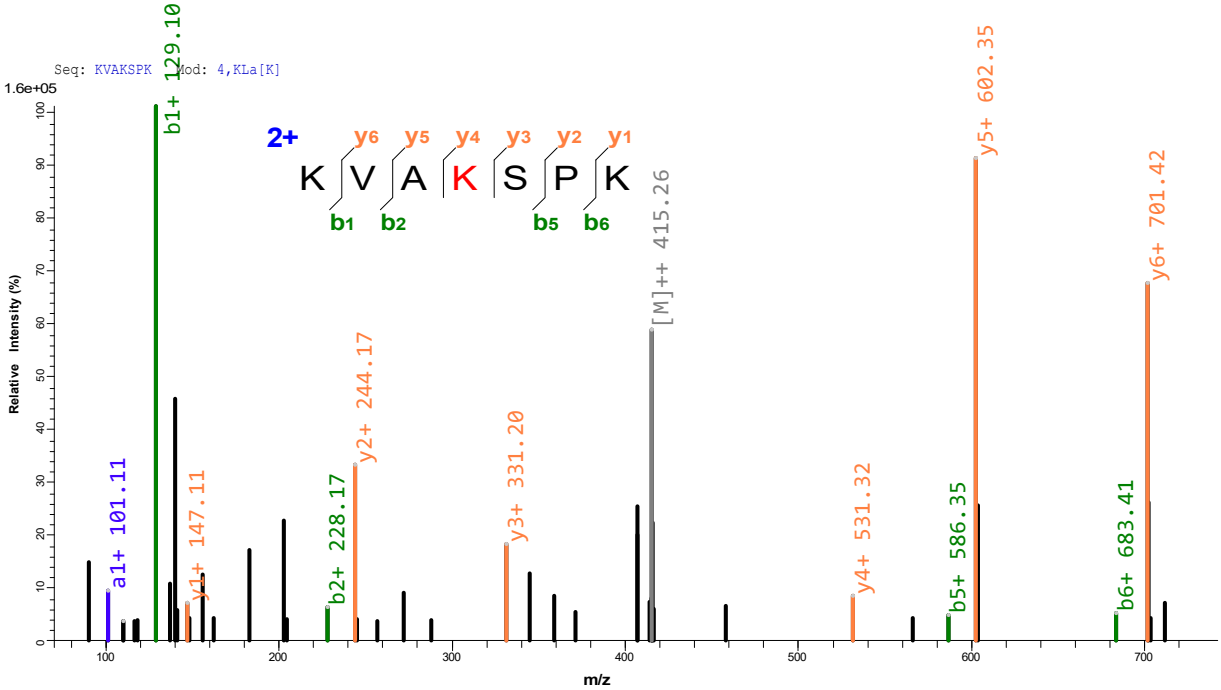
y11+ 1141.65
y12+ 1212.68
Relative Intensity (%)
m/z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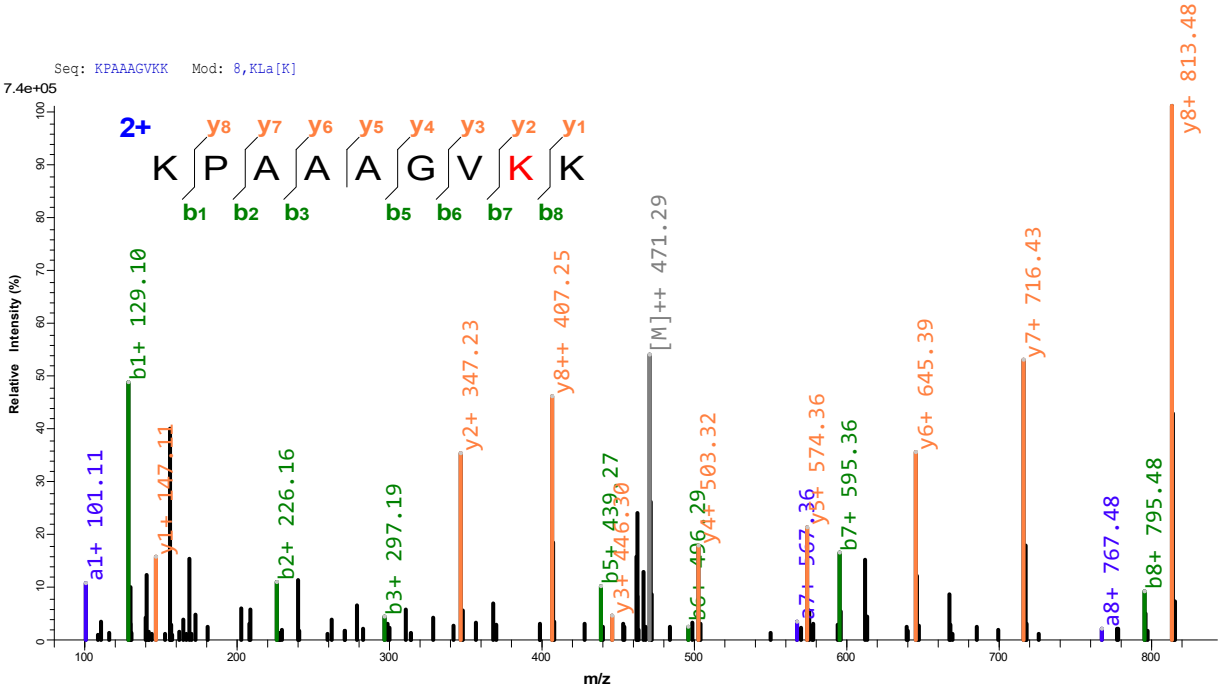
y1+ 147.11
b2+ 228.17
y2+ 244.17
y3+ 331.20
[M]++ 415.26
y4+ 531.32
b5+ 586.35
y5+ 602.35
b6+ 683.41
y6+ 701.42
Relative Intensity (%)
m/z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K P A A A G V K K
b1 b2 b3 b5 b6 b7 b8
Relative Intensity (%)
m/z
a1+ 101.11
b1+ 129.10
y11+ 147.11
b2+ 226.16
b3+ 297.19
y2+ 347.23
y8++ 407.25
b5+ 439.27
y3+ 446.30
[M]++ 471.29
b6+ 496.29
y4+ 503.32
a7+ 567.36
y5+ 574.36
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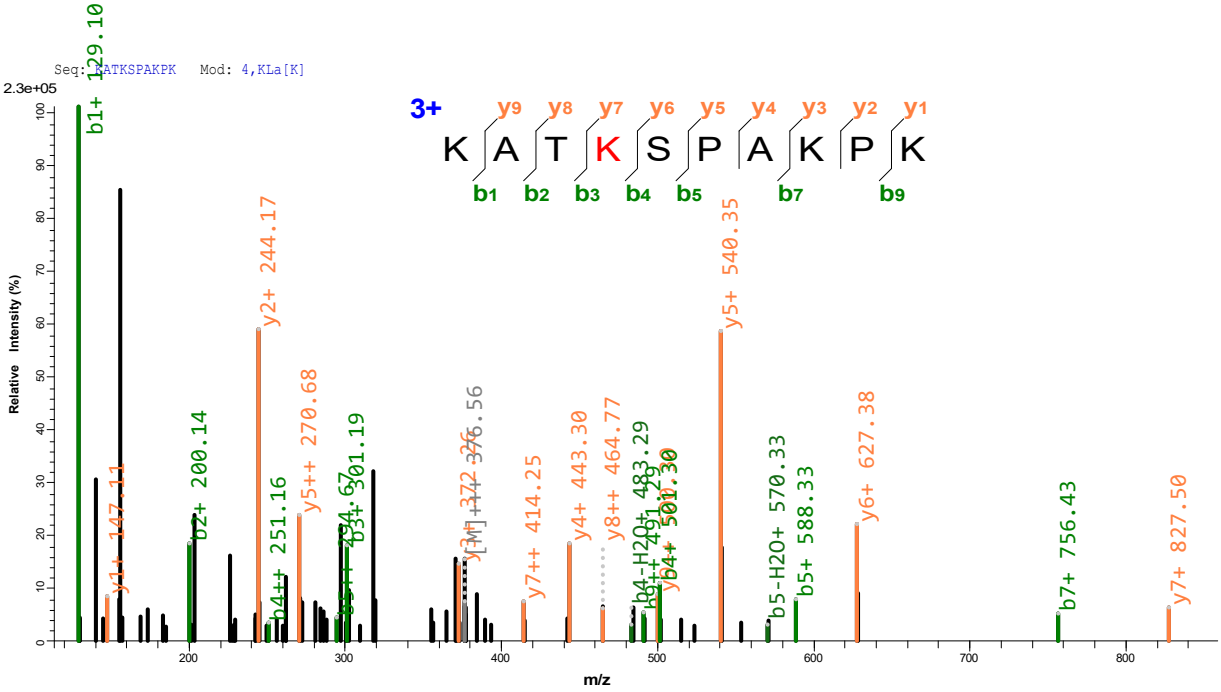
y6+ 645.39
y7+ 716.43
a8+ 767.48
b8+ 795.48
y8+ 813.48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3+
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K A T K S P A K P K
b1 b2 b3 b4 b5 b7 b9
Relative Intensity (%)
m/z
b1+ 129.10
y1+ 147.11
b2+ 200.14
b4++ 251.16
y2+ 244.17
y5++ 270.68
b3+ 301.19
y7++ 414.25
y4+ 443.30
y8++ 464.77
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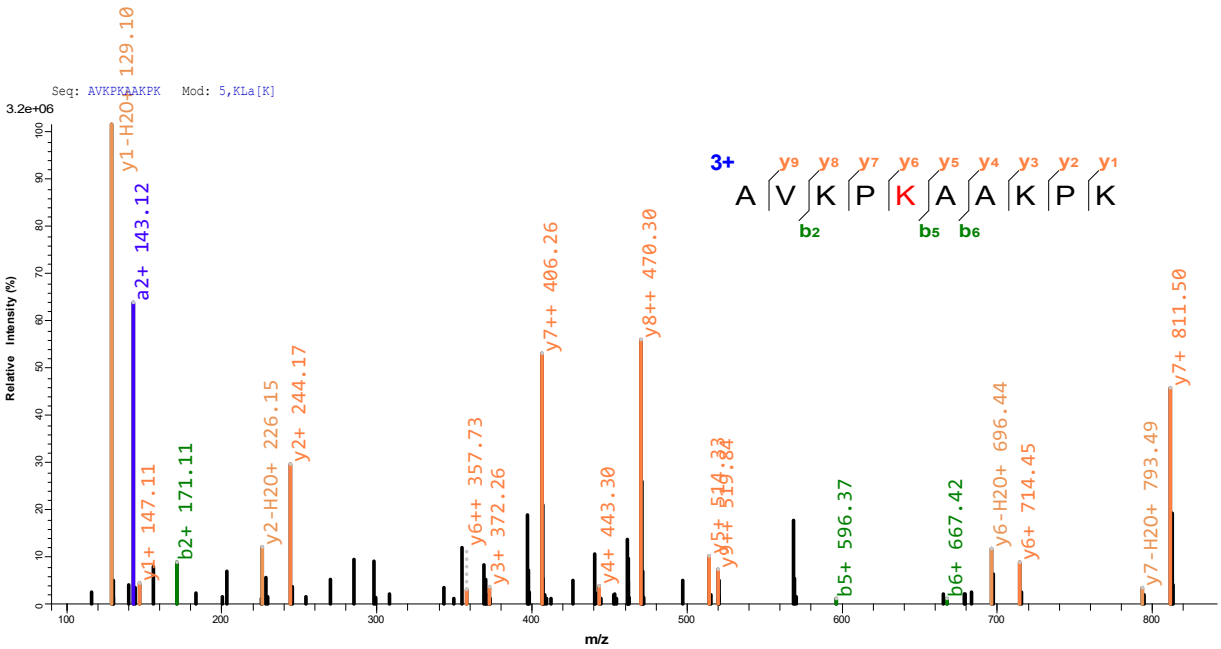
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b2 b5 b6
y1-H2O+ 129.10
a2+ 143.12
y1+ 147.11
b2+ 171.11
y2-H2O+ 226.15
y2+ 244.17
y6++ 357.73
y3+ 372.26
y7++ 406.26
y4+ 443.30
y8++ 470.30
y5++ 514.33
y5++ 519.84
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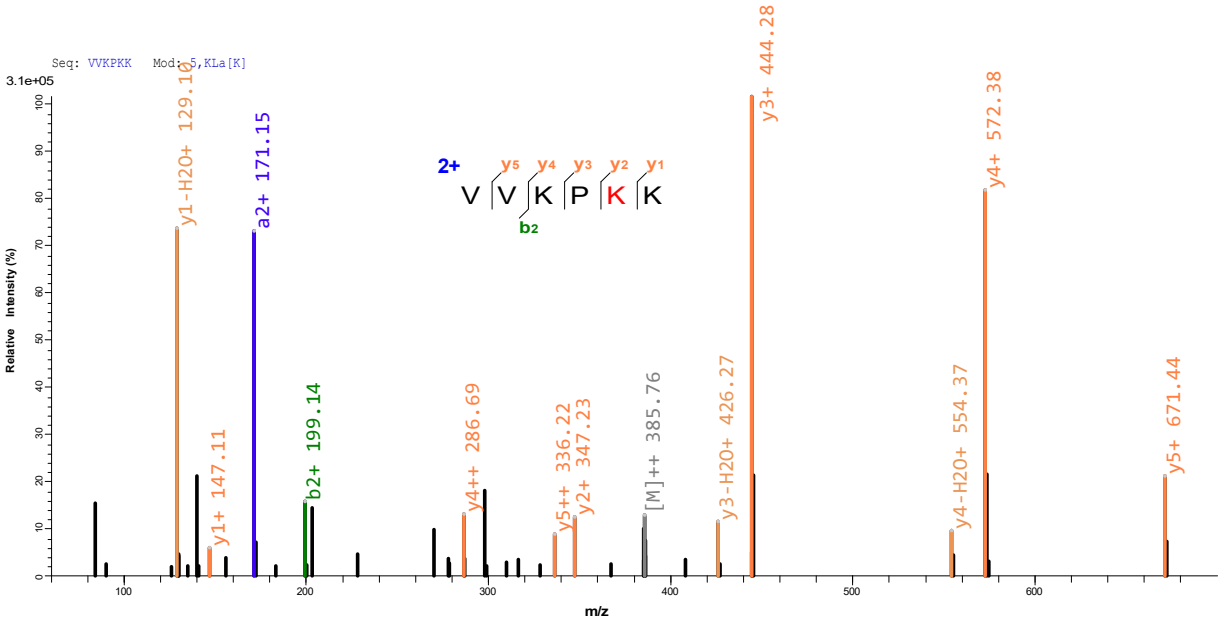
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b2
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a2+ 171.15
y1+ 147.11
b2+ 199.14
y4++ 286.69
y5++ 336.22
y2+ 347.23
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y4-H2O+ 554.37
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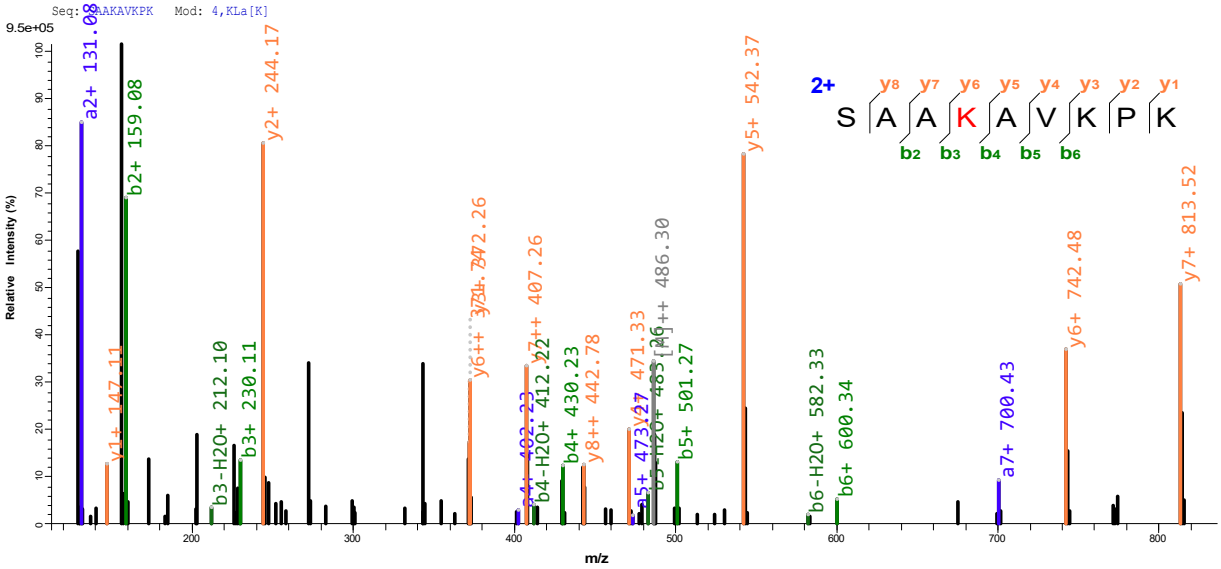
y5+ 671.44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m/z
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a2+ 131.08
b2+ 159.08
y1+ 147.11
b3-H2O+ 212.10
b3+ 230.11
y2+ 244.17
y6++ 372.26
b4-H2O+ 412.22
b4+ 430.23
y8++ 442.78
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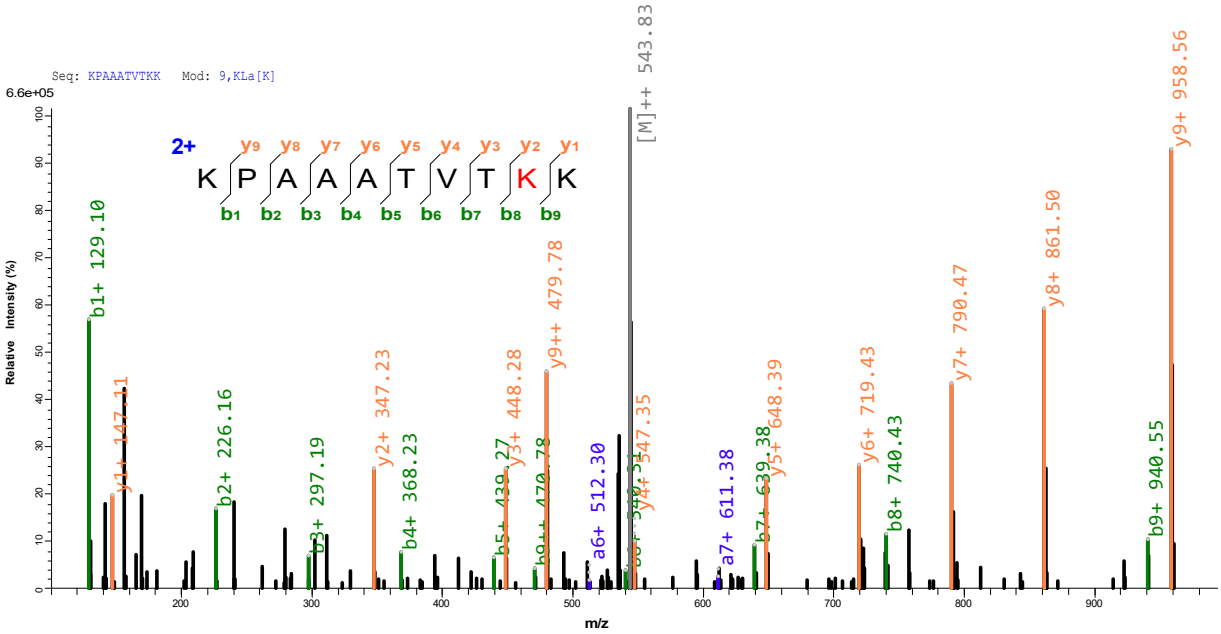
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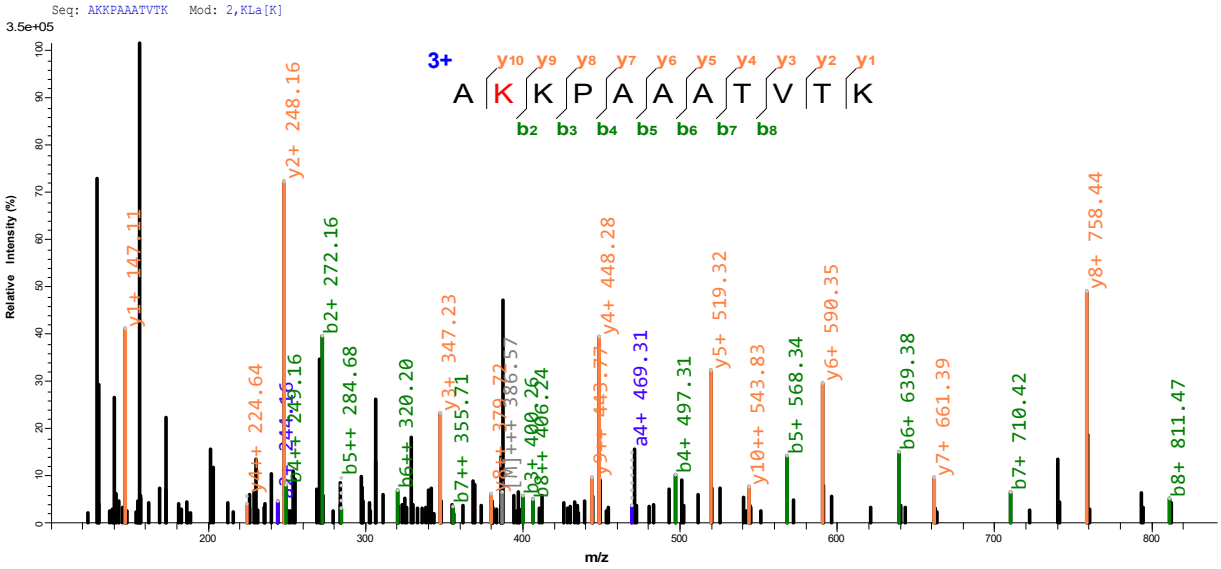
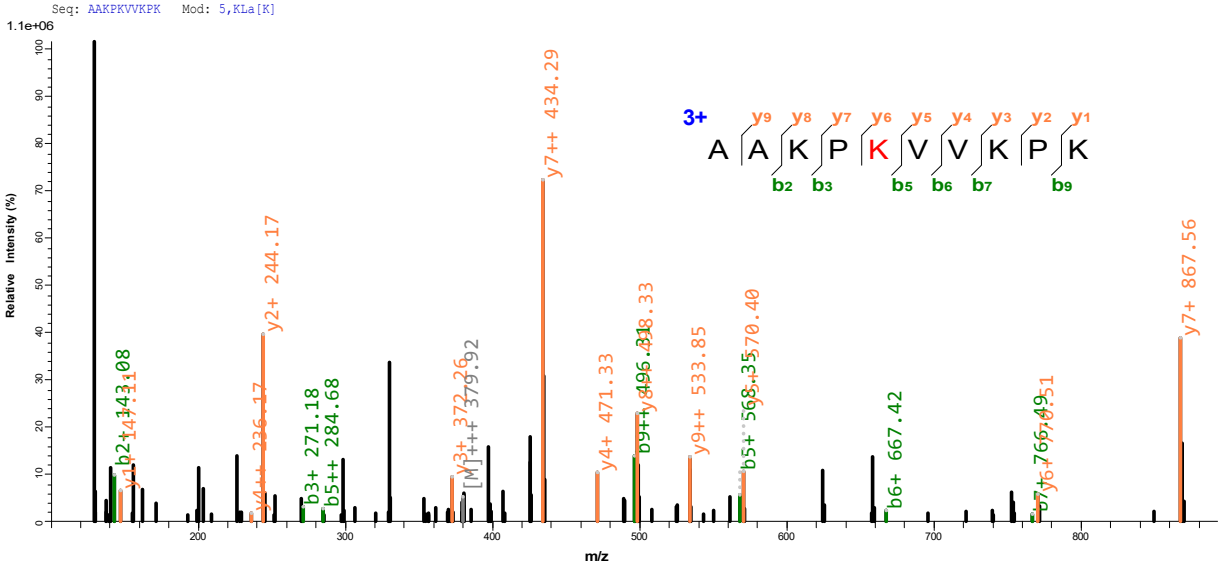
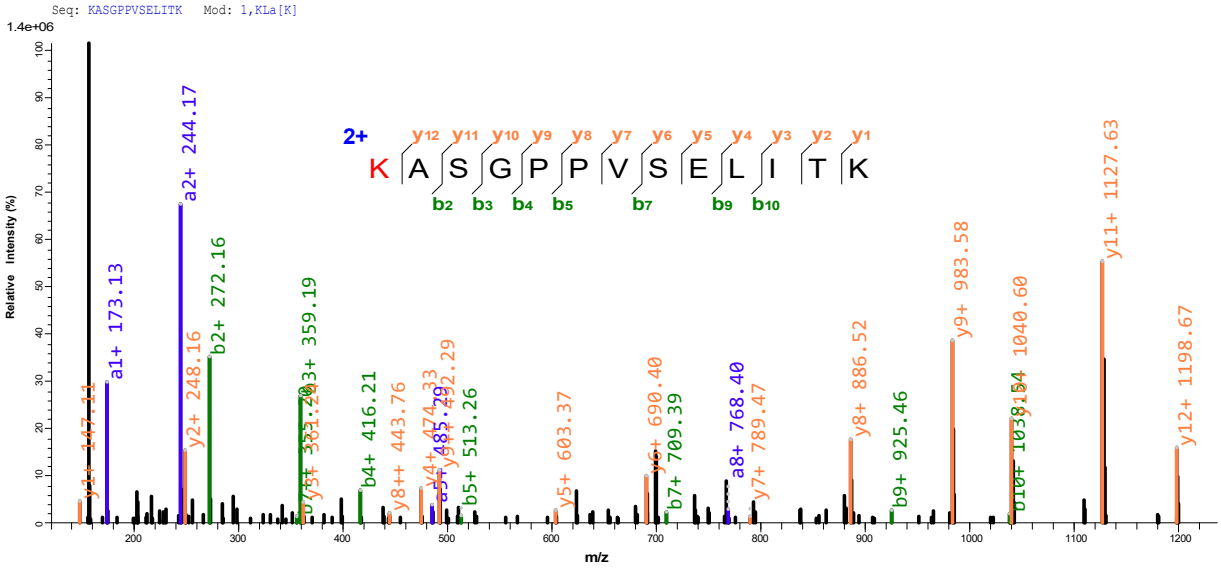
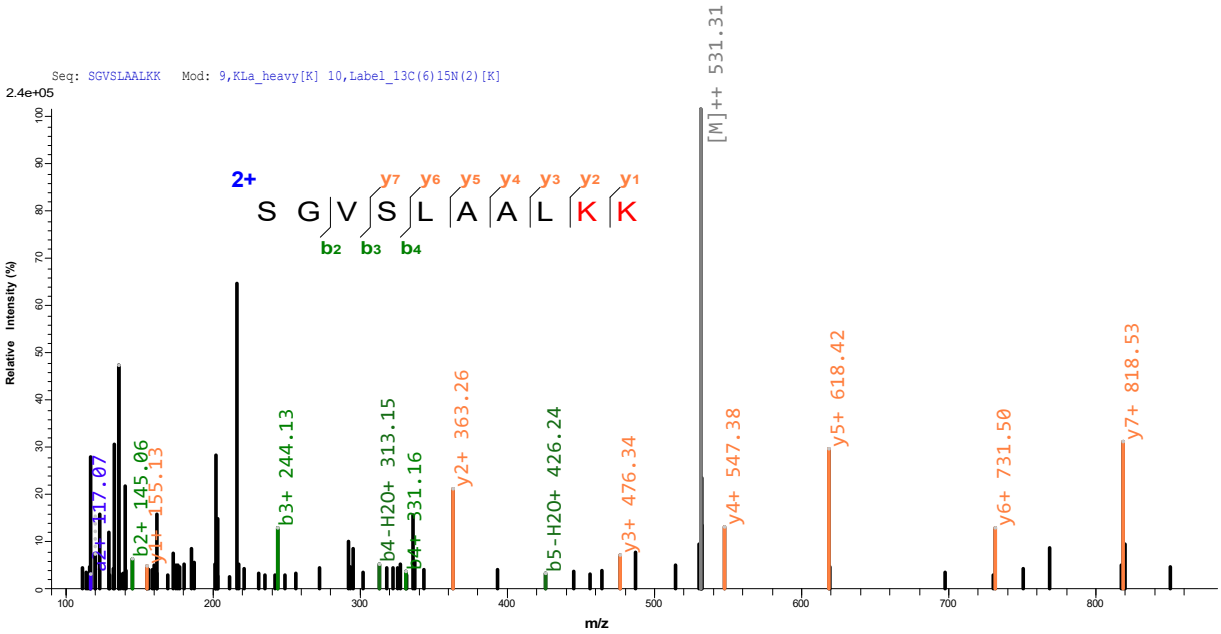
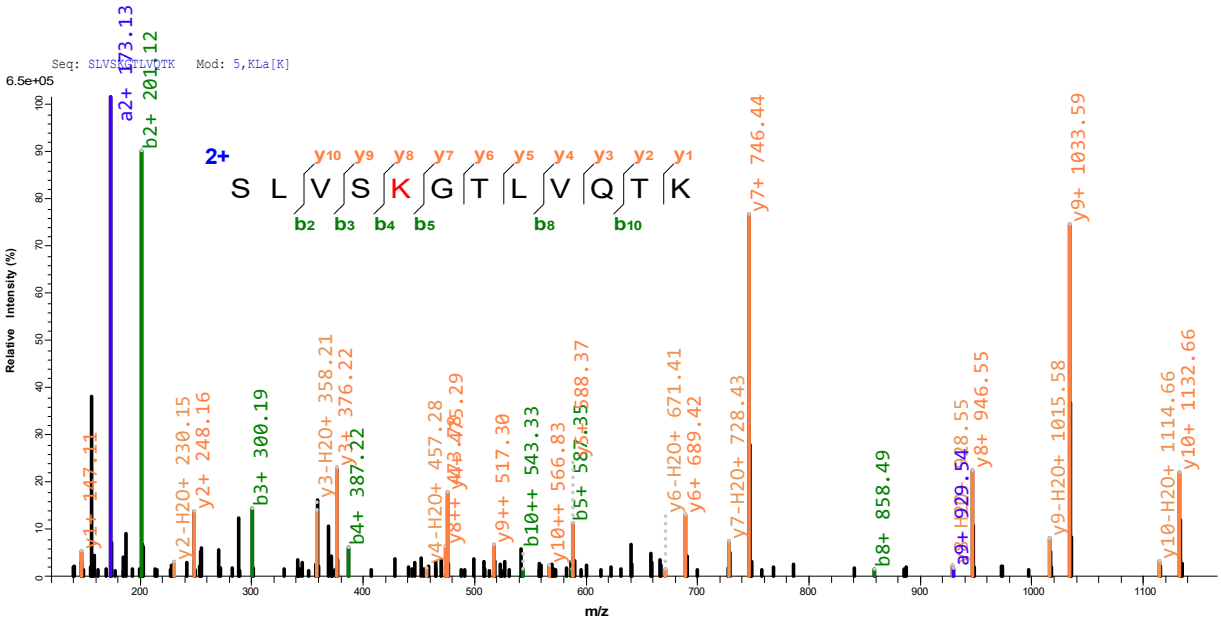
m/z
2+
K P A A A T V T K K
b1 b2 b3 b4 b5 b6 b7 b8 b9
y9 y8 y7 y6 y5 y4 y3 y2 y1
b1+ 129.10
b2+ 226.16
b3+ 297.19
y2+ 347.23
b4+ 368.23
y3+ 448.28
y9++ 479.78
a6+ 512.30
[M]++ 543.83
a7+ 611.38
y5+ 648.39
y6+ 719.43
b8+ 740.43
y7+ 790.47
y8+ 861.50
b9+ 940.55
y9+ 958.56

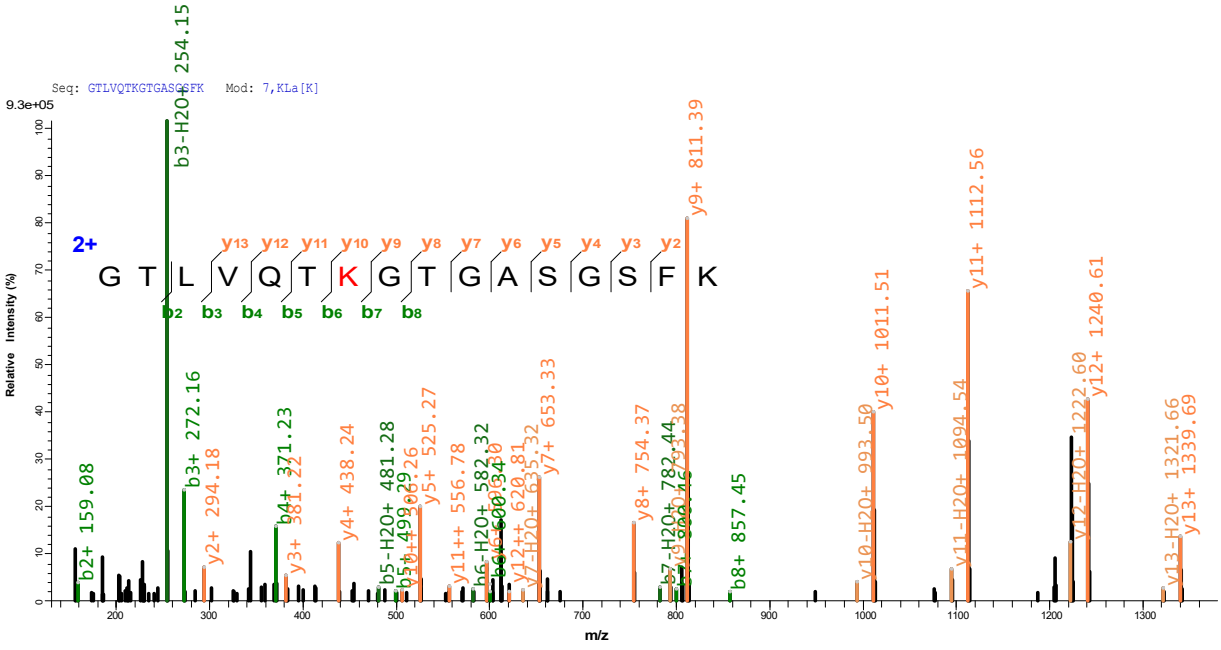

Seq: AKKPAAATVTK Mod: 2,KLa[K]
3.5e+05
Relative Intensity (%)
m/z
3+
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
A K K P A A A T V T K
b2 b3 b4 b5 b6 b7 b8
y2+ 248.16
y1+ 147.11
b2+ 272.16
y+ 224.64
b5++ 284.68
b6++ 320.20
y3+ 347.23
b7++ 355.71
[M]+++ 386.57
b3+ 400.25
b8++ 406.24
y4+ 448.28
a4+ 469.31
b4+ 497.31
y5+ 519.32
y10++ 543.83
b5+ 568.34
y6+ 590.35
b6+ 639.38
y7+ 661.39
b7+ 710.42
y8+ 758.44
b8+ 811.47

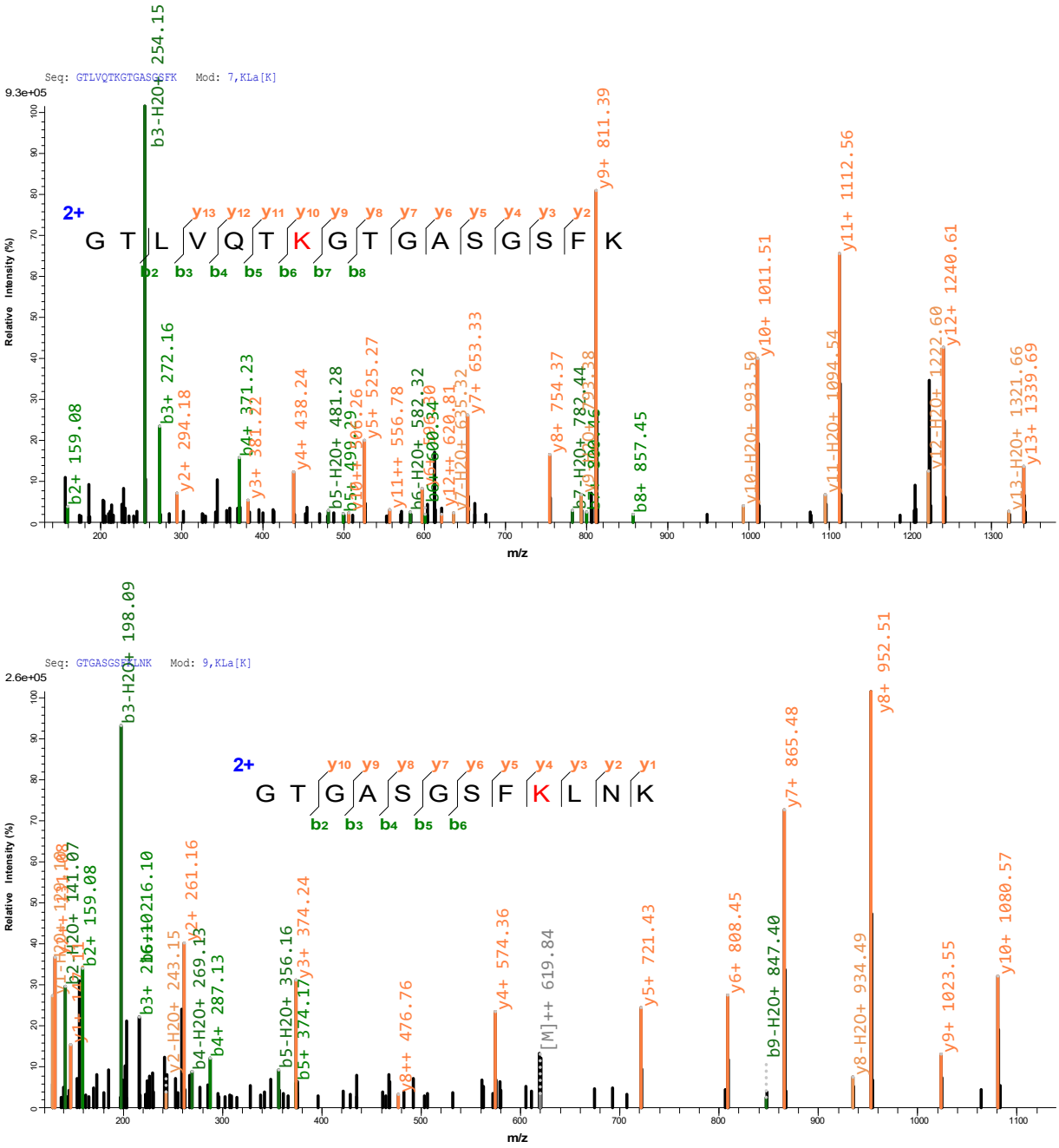

Seq: AAKPKVVKPK Mod: 5,KLa[K]
1.1e+06
Relative Intensity (%)
m/z
3+
y9 y8 y7 y6 y5 y4 y3 y2 y1
A A K P K V V K P K
b2 b3 b5 b6 b7 b9
y7++ 434.29
y2+ 244.17
b2+ 143.08
y1+ 147.11
y4++ 236.17
b3+ 271.18
b5++ 284.68
y3+ 372.26
[M]+++ 379.92
y4+ 471.33
b9++ 496.33
y9++ 533.85
b5+ 568.35
y6+ 667.42
y7+ 867.56

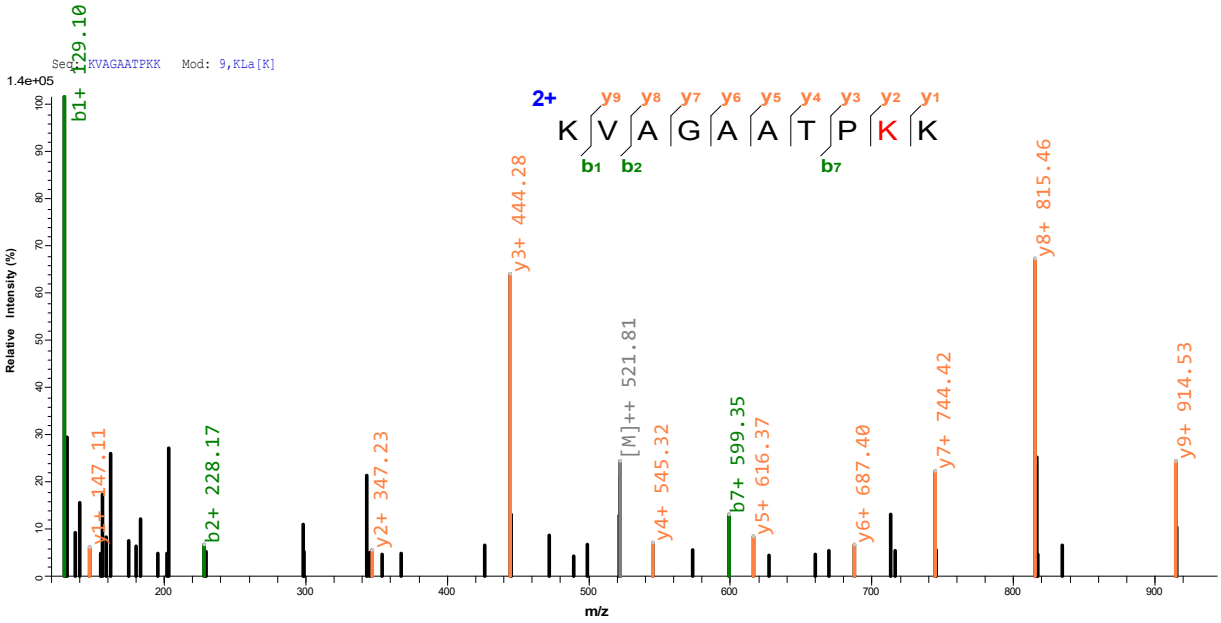

Seq: KASGPPVSELITK Mod: 1,KLa[K]
1.4e+06
Relative Intensity (%)
2+
K A S G P P V S E L I T K
b2 b3 b4 b5 b7 b9 b10
a1+ 173.13
a2+ 244.17
b2+ 272.16
y2+ 248.16
b3+ 359.19
b4+ 416.21
y8++ 443.76
y5+ 603.37
b5+ 513.26
b7+ 709.39
y6+ 690.40
a8+ 768.40
y7+ 789.47
y8+ 886.52
b9+ 925.46
y9+ 983.58
y11+ 1127.63
y12+ 1198.67
m/z

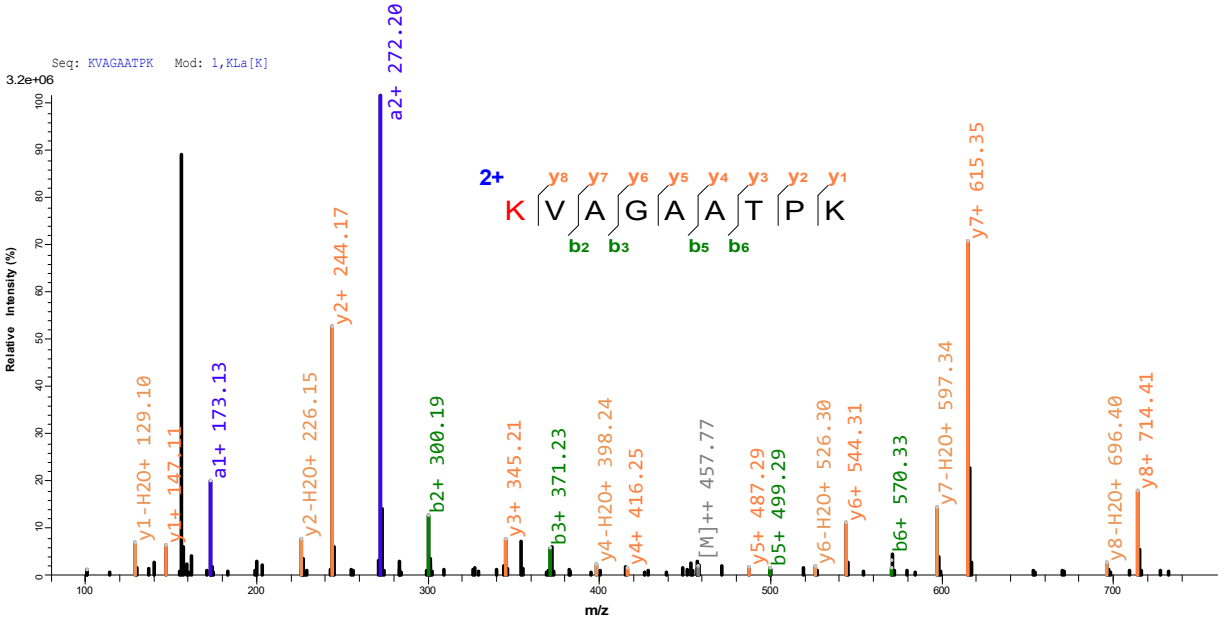

Seq: SGVSLAALKK Mod: 9,KLa_heavy[K] 10,Label_13C(6)15N(2)[K]
2.4e+05
Relative Intensity (%)
2+
S G V S L A A L K K
b2 b3 b4
[M]++ 531.31
b3+ 244.13
b4-H2O+ 313.15
y2+ 363.26
b5-H2O+ 426.24
y3+ 476.34
y4+ 547.38
y5+ 618.42
y6+ 731.50
y7+ 818.53
m/z

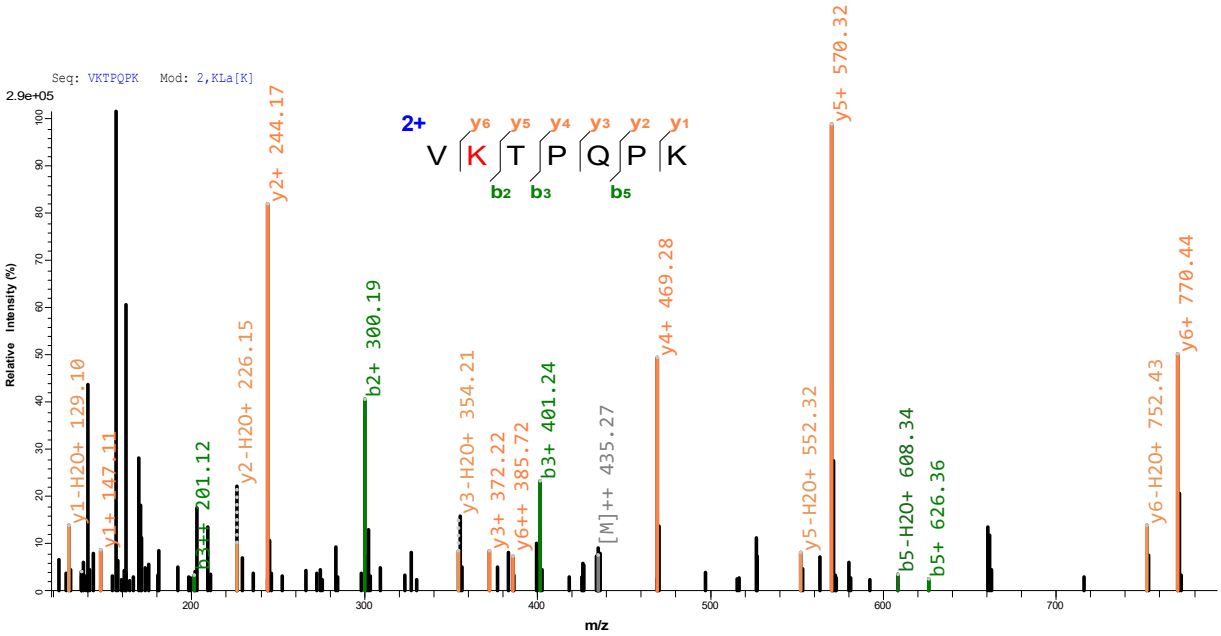

Seq: SLVSKGTLVQTK Mod: 5,KLa[K]
6.5e+05
Relative Intensity (%)
m/z
2+
S L V S K G T L V Q T K
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b4 b5 b8 b10
a2+ 173.13
b2+ 201.12
y1+ 147.11
y2-H2O+ 230.15
y2+ 248.16
b3+ 300.19
y3-H2O+ 358.21
y3+ 376.22
b4+ 387.22
y4-H2O+ 457.28
y4+ 475.29
y8++ 443.75
y9++ 517.30
b10++ 543.33
y10++ 566.83
b5+ 587.35
588.37
y6-H2O+ 671.41
y6+ 689.42
y7+ 746.44
y7-H2O+ 728.43
b8+ 858.49
a9+ 929.54
948.55
y8+ 946.55
y9+ 1033.59
y9-H2O+ 1015.58
y10-H2O+ 1114.66
y10+ 1132.66

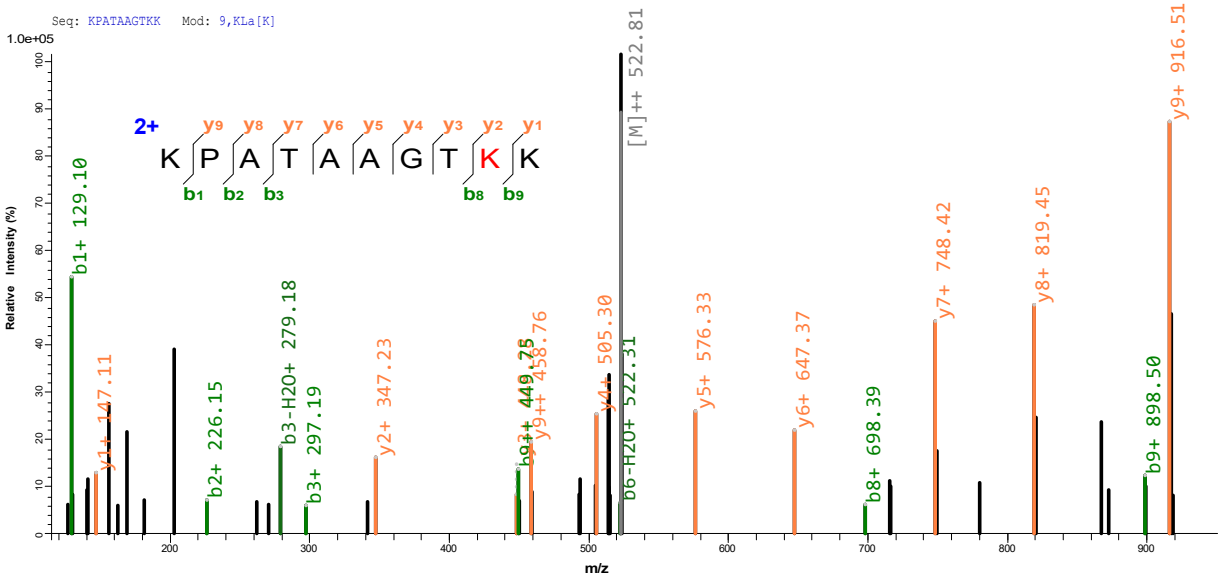

Seq: GTLVQTKGTGASGSFK Mod: 7,KLa[K]
9.3e+05
Relative Intensity (%)
m/z
2+
G T L V Q T K G T G A S G S F K
y13 y12 y11 y10 y9 y8 y7 y6 y5 y4 y3 y2
b2 b3 b4 b5 b6 b7 b8
b3-H2O+ 254.15
y9+ 811.39
b2+ 159.08
b3+ 272.16
y2+ 294.18
b4+ 371.23
y3+ 381.22
y4+ 438.24
b5-H2O+ 481.28
y5+ 525.27
y11++ 556.78
b6-H2O+ 582.32
y12++ 620.81
y7-H2O+ 635.32
y7+ 653.33
y8+ 754.37
b8+ 857.45
y10+ 1011.51
y11+ 1112.56
y12+ 1240.61
y13-H2O+ 1321.66
y13+ 1339.69

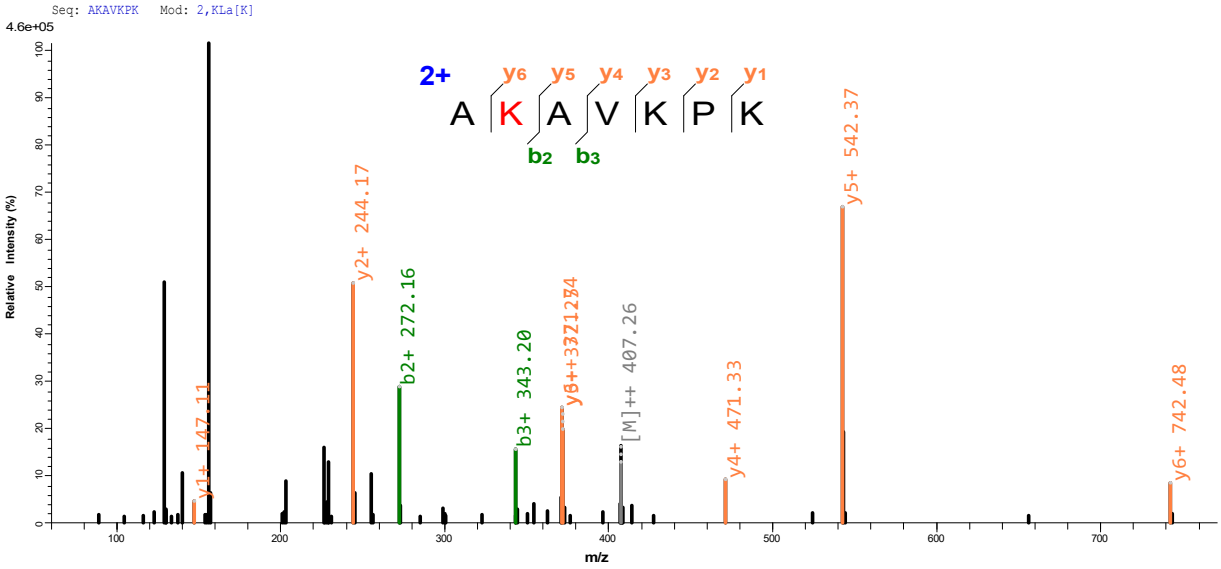

Seq: GTLVQTKGTGASGSFK Mod: 7,KLa[K]
9.3e+05
Relative Intensity (%)
m/z
2+
G T L V Q T K G T G A S G S F K
b3-H2O+ 254.15
y9+ 811.39
y11+ 1112.56
y10+ 1011.51
y12+ 1240.61
b3+ 272.16
b2+ 159.08
y2+ 294.18
b4+ 371.23
y4+ 438.24
b5-H2O+ 481.28
y5+ 525.27
y11++ 556.78
b6-H2O+ 582.32
y7+ 653.33
y8+ 754.37
b8+ 857.45
y10-H2O+ 993.50
y11-H2O+ 1094.54
y12-H2O+ 1222.60
y13-H2O+ 1321.66
y13+ 1339.69
Seq: GTGASGSFLNK Mod: 9,KLa[K]
2.6e+05
Relative Intensity (%)
m/z
2+
G T G A S G S F K L N K
b3-H2O+ 198.09
y8+ 952.51
y7+ 865.48
y1-H2O+ 141.07
b2+ 159.08
b3+ 216.10
y2-H2O+ 243.15
b4-H2O+ 269.13
b4+ 287.13
b5-H2O+ 356.16
b5+ 374.17
y3+ 374.24
y8++ 476.76
y4+ 574.36
[M]++ 619.84
y5+ 721.43
y6+ 808.45
b9-H2O+ 847.40
y8-H2O+ 934.49
y9+ 1023.55
y10+ 1080.57

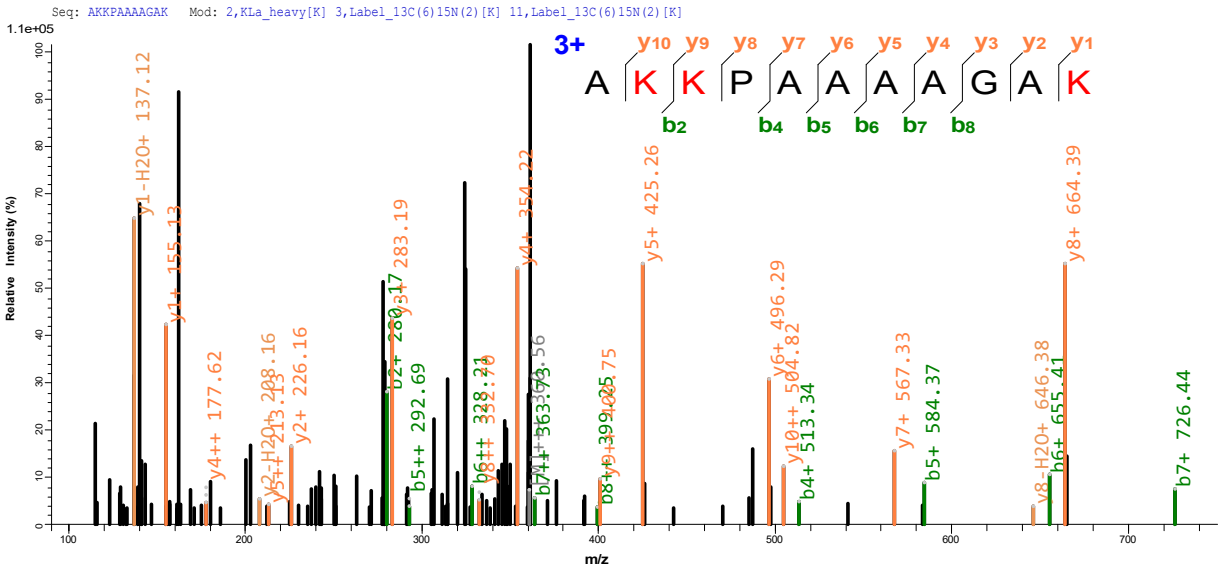

Seq: KVAGAATPKK Mod: 9,KLa[K]
1.4e+05
Relative Intensity (%)
m/z
2+
K V A G A A T P K K
b1 b2 b7
b1+ 129.10
y1+ 147.11
b2+ 228.17
y2+ 347.23
y3+ 444.28
[M]++ 521.81
y4+ 545.32
b7+ 599.35
y5+ 616.37
y6+ 687.40
y7+ 744.42
y8+ 815.46
y9+ 914.53

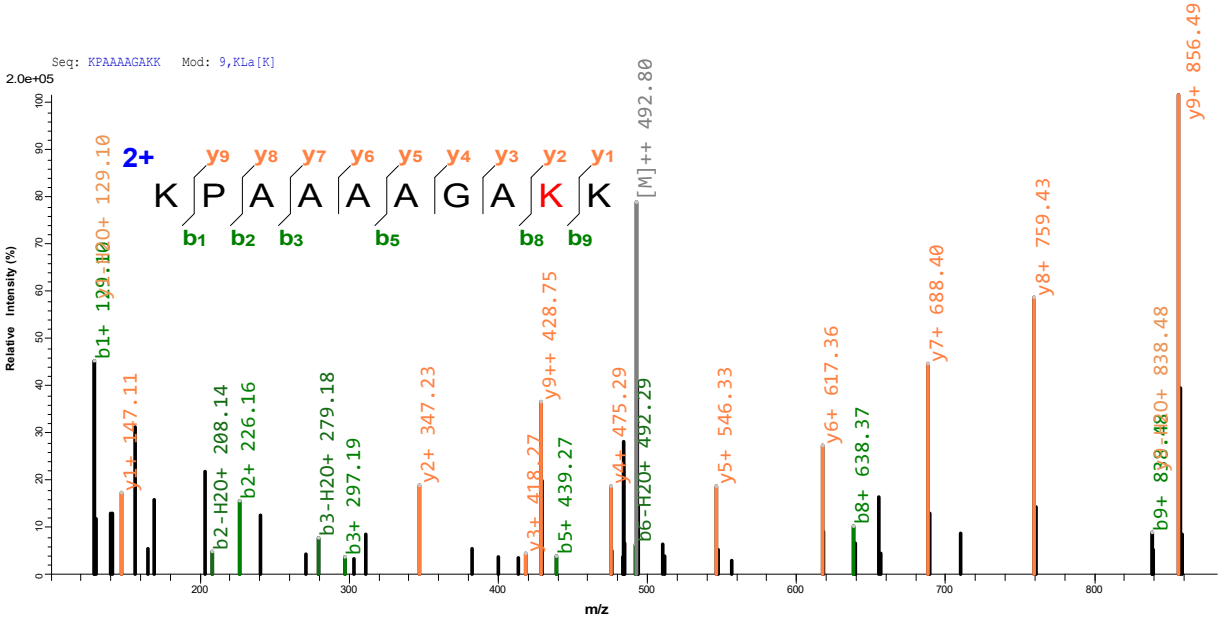

Seq: KVAGAATPK Mod: 1,KLa[K]
3.2e+06
Relative Intensity (%)
m/z
2+
K V A G A A T P K
b2 b3 b5 b6
y1-H2O+ 129.10
y1+ 147.11
a1+ 173.13
y2-H2O+ 226.15
y2+ 244.17
a2+ 272.20
b2+ 300.19
y3+ 345.21
b3+ 371.23
y4-H2O+ 398.24
y4+ 416.25
[M]++ 457.77
y5+ 487.29
b5+ 499.29
y6-H2O+ 526.30
y6+ 544.31
b6+ 570.33
y7-H2O+ 597.34
y7+ 615.35
y8-H2O+ 696.40
y8+ 714.41


Seq: VKTPQPK Mod: 2,KLa[K]
2.9e+05
2+
V K T P Q P K
y6 y5 y4 y3 y2 y1
b2 b3 b5
y5+ 570.32
y2+ 244.17
y1-H2O+ 129.10
y1+ 147.11
201.12
y2-H2O+ 226.15
b2+ 300.19
y3-H2O+ 354.21
y3+ 372.22
y6++ 385.72
b3+ 401.24
[M]++ 435.27
y4+ 469.28
y5-H2O+ 552.32
b5-H2O+ 608.34
b5+ 626.36
y6-H2O+ 752.43
y6+ 770.44
Relative Intensity (%)
m/z

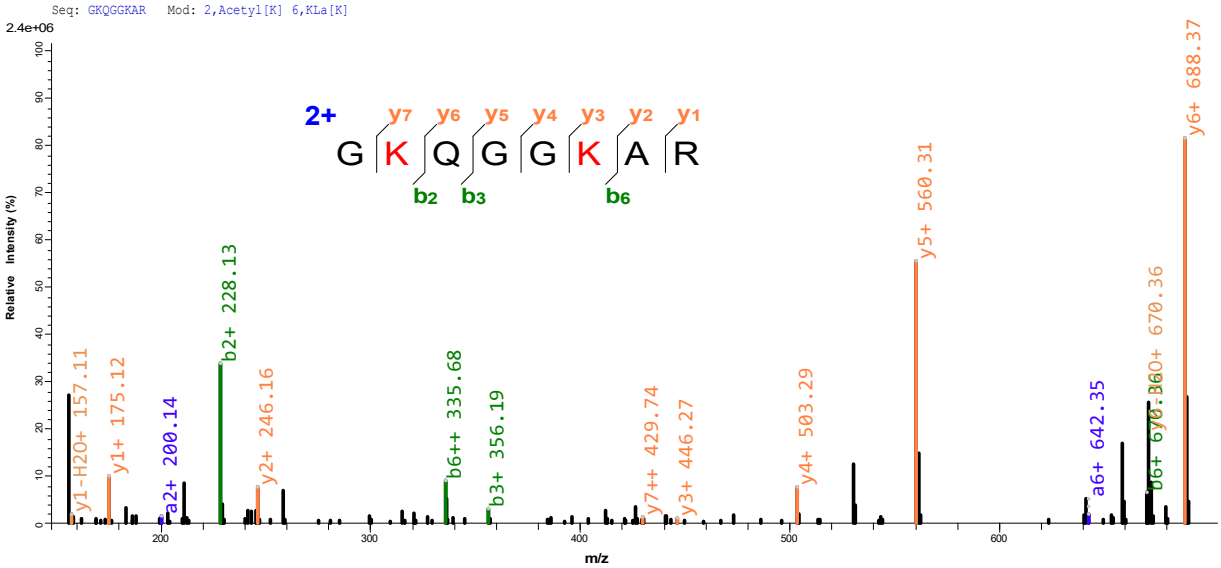

Seq: KPATAAGTKK Mod: 9,KLa[K]
1.0e+05
2+
K P A T A A G T K K
y9 y8 y7 y6 y5 y4 y3 y2 y1
b1 b2 b3 b8 b9
[M]++ 522.81
y9+ 916.51
b1+ 129.10
y1+ 147.11
b2+ 226.15
b3-H2O+ 279.18
b3+ 297.19
y2+ 347.23
y9++ 458.76
y4+ 505.30
b6-H2O+ 522.31
y5+ 576.33
y6+ 647.37
b8+ 698.39
y7+ 748.42
y8+ 819.45
b9+ 898.50
Relative Intensity (%)
m/z

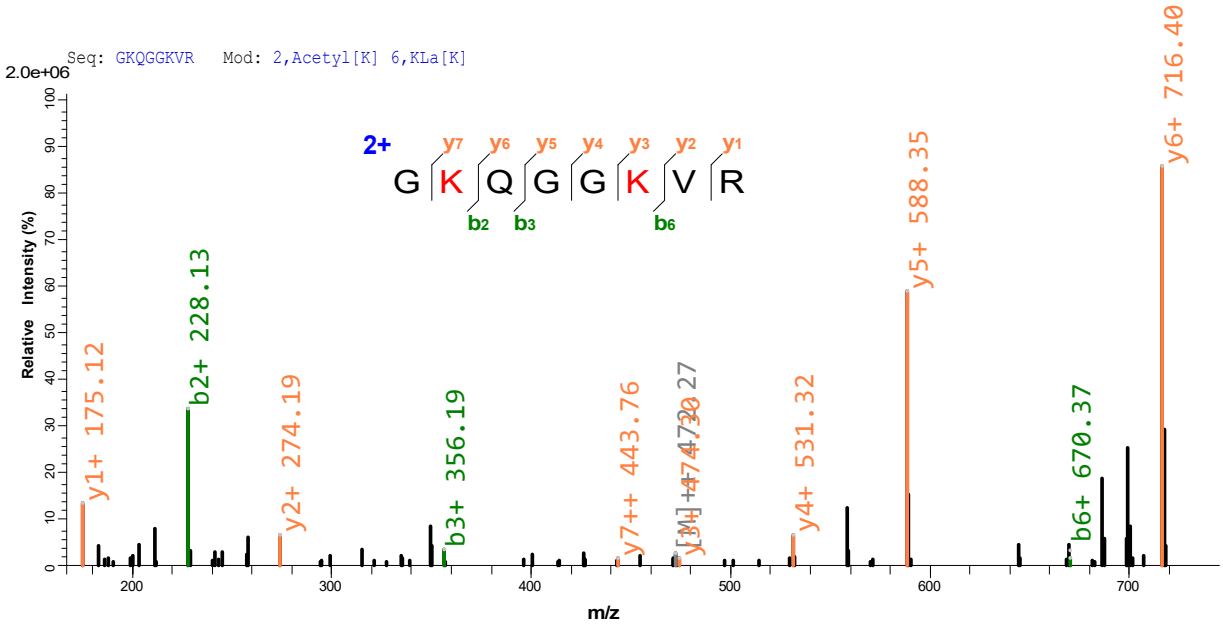

Seq: AKAVKPK Mod: 2,KLa[K]
4.6e+05
2+
y6 y5 y4 y3 y2 y1
A K A V K P K
b2 b3
y5+ 542.37
y2+ 244.17
b2+ 272.16
b3+ 343.20
[M]++ 407.26
y4+ 471.33
y6+ 742.48
y1+ 147.11
Relative Intensity (%)
m/z

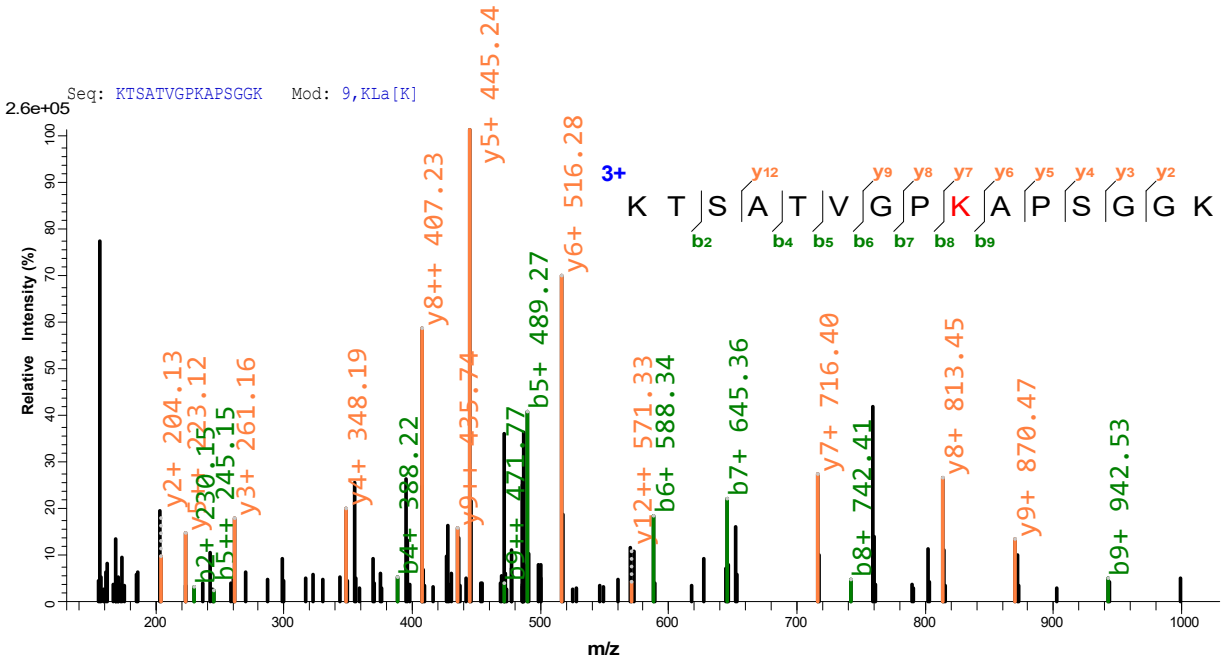

Seq: AKKPAAAAGAK Mod: 2,KLa_heavy[K] 3,Label_13C(6)15N(2)[K] 11,Label_13C(6)15N(2)[K]
1.1e+05
3+
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
A K K P A A A A G A K
b2 b4 b5 b6 b7 b8
y1-H2O+ 137.12
y1+ 155.13
y5+ 425.26
y8+ 664.39
y6+ 496.29
y4+ 354.22
y7+ 567.33
b5+ 584.37
b7+ 726.44
y4++ 177.62
y2+ 226.16
b2+ 283.19
b5++ 292.69
b4+ 513.34
y8-H2O+ 646.38
b6+ 655.41
Relative Intensity (%)
m/z

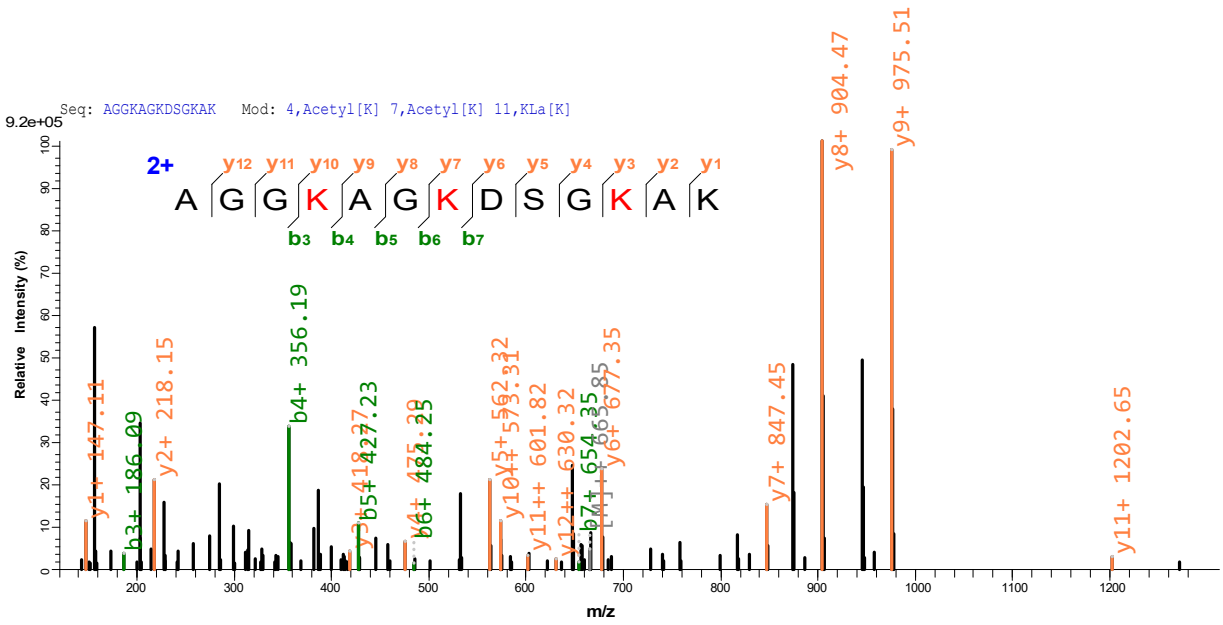

Seq: KPAAAAGAKK Mod: 9,KLa[K]
2.0e+05
Relative Intensity (%)
2+
y9 y8 y7 y6 y5 y4 y3 y2 y1
K P A A A A G A K K
b1 b2 b3 b5 b8 b9
b1+ 129.10
b1-H2O+ 129.10
y1+ 147.11
b2-H2O+ 208.14
b2+ 226.16
b3-H2O+ 279.18
b3+ 297.19
y2+ 347.23
y3+ 418.27
y9++ 428.75
b5+ 439.27
y4+ 475.29
[M]++ 492.80
b6-H2O+ 492.29
y5+ 546.33
y6+ 617.36
b8+ 638.37
y7+ 688.40
y8+ 759.43
b9+ 838.48
y9+ 856.49
m/z

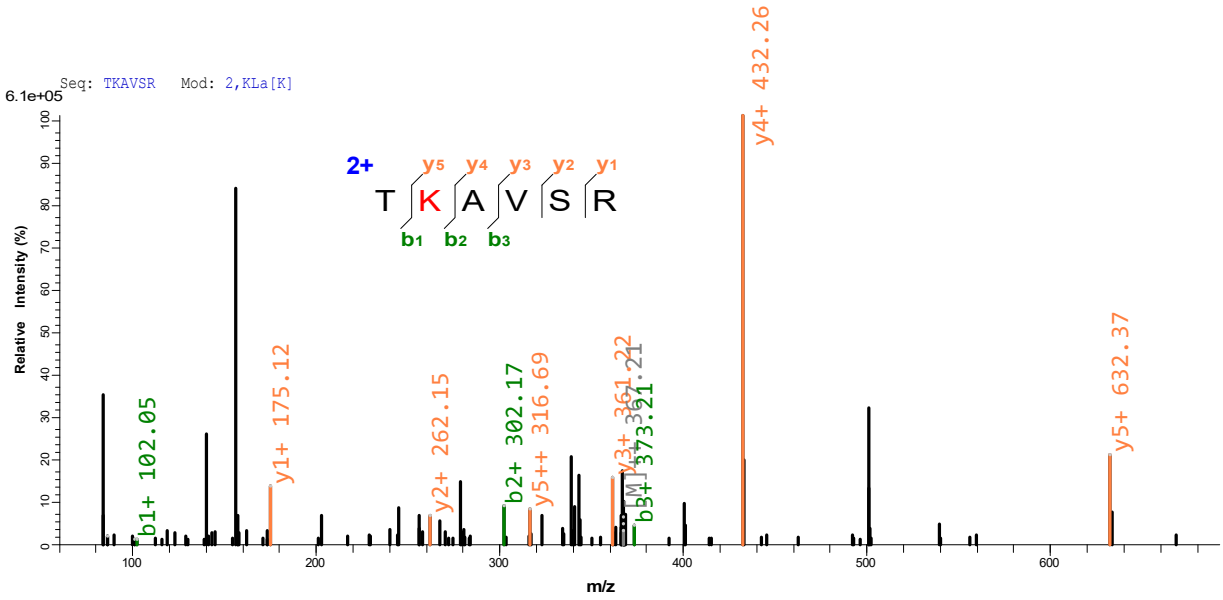
H2A

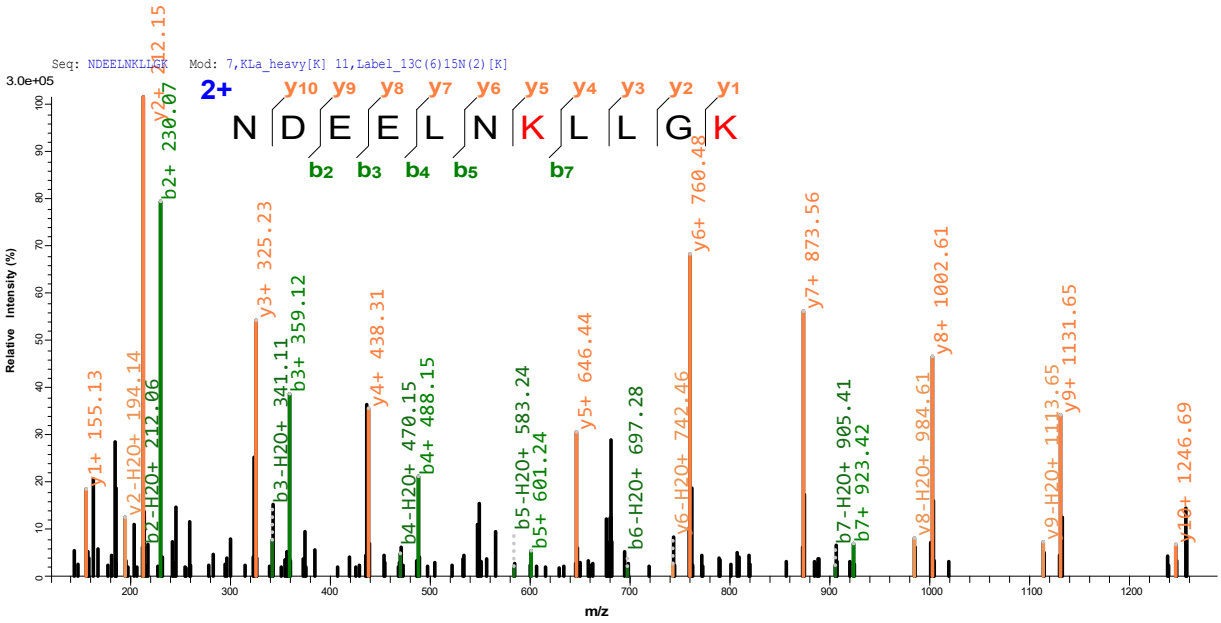

Seq: GKQGGKAR Mod: 2,Acetyl[K] 6,KLa[K]
2.4e+06
Relative Intensity (%)
2+
y7 y6 y5 y4 y3 y2 y1
G K Q G G K A R
b2 b3 b6
y1-H2O+ 157.11
y1+ 175.12
a2+ 200.14
b2+ 228.13
y2+ 246.16
b6++ 335.68
b3+ 356.19
y7++ 429.74
y3+ 446.27
y4+ 503.29
y5+ 560.31
a6+ 642.35
b6+ 670.36
y6+ 688.37
m/z

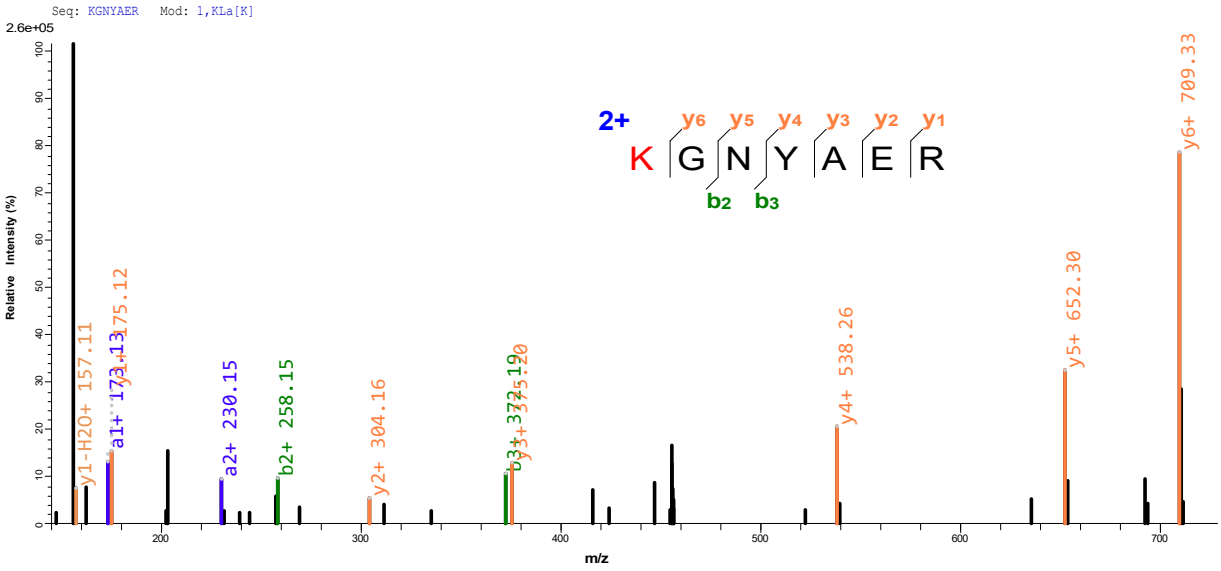

Seq: GKQGGKVR Mod: 2,Acetyl[K] 6,KLa[K]
2.0e+06
Relative Intensity (%)
2+
G K Q G G K V R
y7 y6 y5 y4 y3 y2 y1
b2 b3 b6
y1+ 175.12
b2+ 228.13
y2+ 274.19
b3+ 356.19
y7++ 443.76
y[M]++ 474.27
y4+ 531.32
y5+ 588.35
b6+ 670.37
y6+ 716.40
m/z


Seq: KTSATVGPKAPSGGK Mod: 9,KLa[K]
2.6e+05
Relative Intensity (%)
3+
K T S A T V G P K A P S G G K
y12 y9 y8 y7 y6 y5 y4 y3 y2
b2 b4 b5 b6 b7 b8 b9
y2+ 204.13
y3+ 261.16
y4+ 348.19
b4+ 388.22
y8++ 407.23
y5+ 445.24
y9++ 435.74
b5+ 489.27
y6+ 516.28
y12++ 571.33
b6+ 588.34
b7+ 645.36
y7+ 716.40
b8+ 742.41
y8+ 813.45
y9+ 870.47
b9+ 942.53
m/z

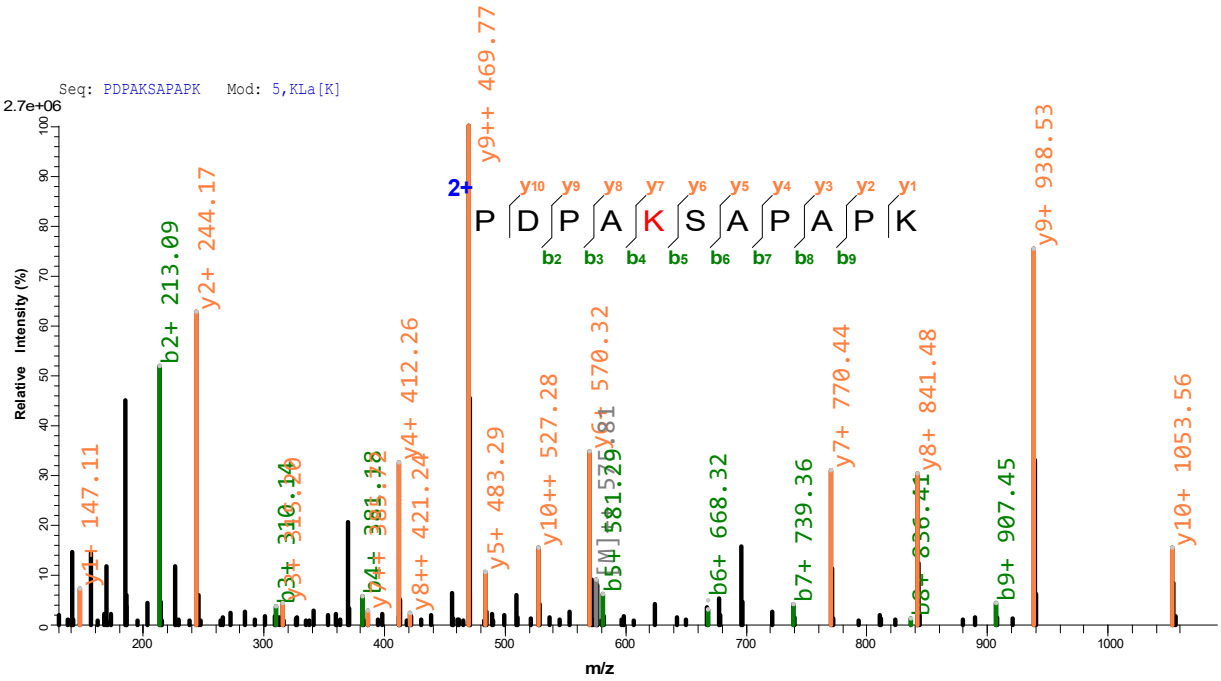

Seq: AGGKAGKDSGKAK Mod: 4,Acetyl[K] 7,Acetyl[K] 11,KLa[K]
9.2e+05
2+
A G G K A G K D S G K A K
b3 b4 b5 b6 b7
Relative Intensity (%)
m/z
y8+ 904.47
y9+ 975.51
b4+ 356.19
y2+ 218.15
y1+ 147.11
b3+ 186.09
y7+ 847.45
y11+ 1202.65

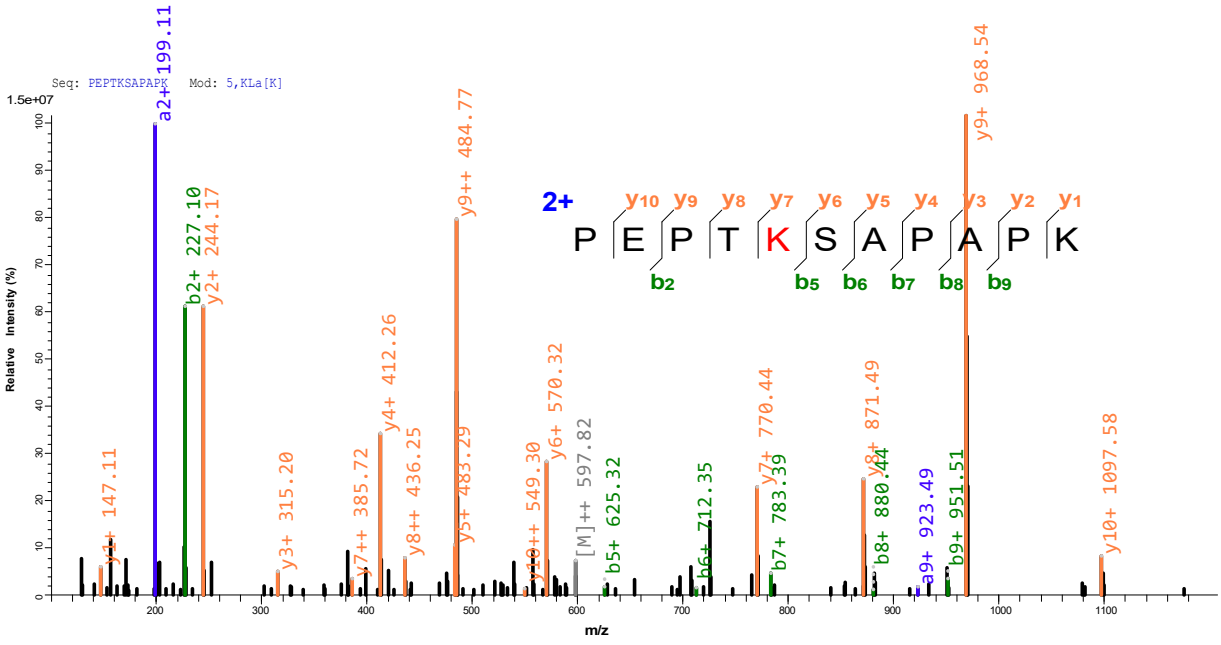

Seq: TKAVSR Mod: 2,KLa[K]
6.1e+05
2+
T K A V S R
b1 b2 b3
Relative Intensity (%)
m/z
y4+ 432.26
y5+ 632.37
b1+ 102.05
y1+ 175.12
y2+ 262.15
b2+ 302.17
y5++ 316.69
b3+ 373.21

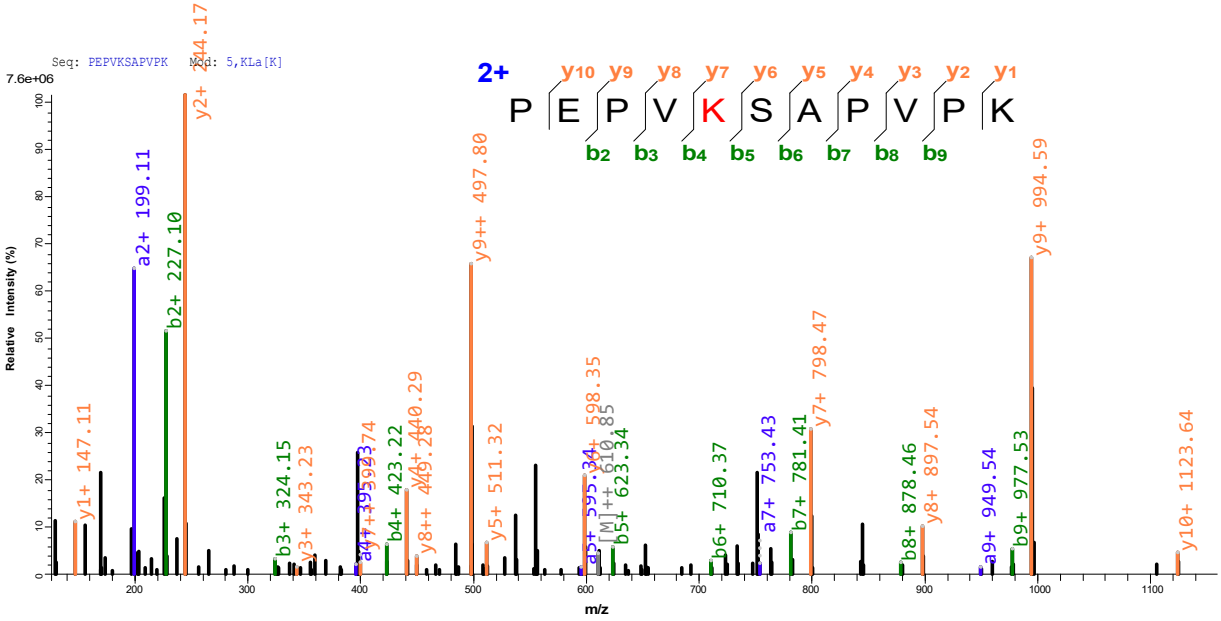

Seq: NDEELNKLLGK Mod: 7,KLa_heavy[K] 11,Label_13C(6)15N(2)[K]
3.0e+05
2+
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
N D E E L N K L L G K
b2 b3 b4 b5 b7
y2+ 1212.15
b2+ 230.07
y3+ 325.23
b3+ 359.12
y4+ 438.31
y6+ 760.48
y7+ 873.56
y8+ 1002.61
y9+ 1131.65
y10+ 1246.69
y1+ 155.13
y2-H2O+ 194.14
b2-H2O+ 212.06
b3-H2O+ 341.11
b4-H2O+ 470.15
b4+ 488.15
b5-H2O+ 583.24
b5+ 601.24
y5+ 646.44
b6-H2O+ 697.28
y6-H2O+ 742.46
b7-H2O+ 905.41
b7+ 923.42
y8-H2O+ 984.61
y9-H2O+ 1113.65
Relative Intensity (%)
m/z

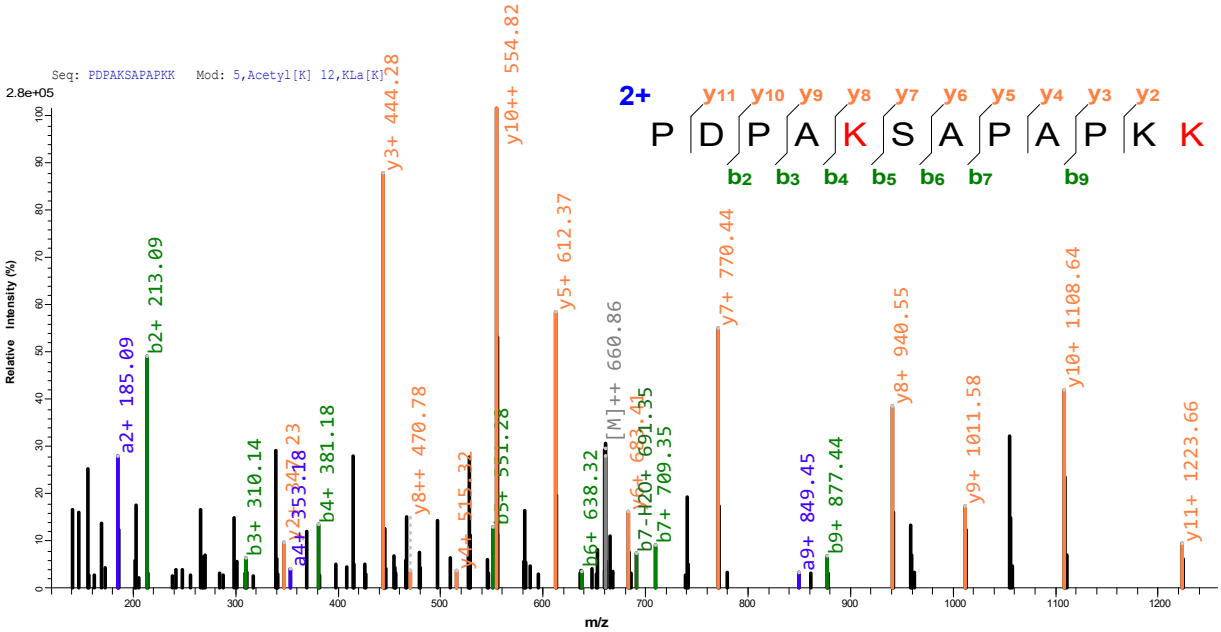

Seq: KGNYAER Mod: 1,KLa[K]
2.6e+05
2+
y6 y5 y4 y3 y2 y1
K G N Y A E R
b2 b3
y6+ 709.33
y5+ 652.30
y4+ 538.26
y1-H2O+ 157.11
a1+ 175.12
a2+ 230.15
b2+ 258.15
y2+ 304.16
b3+ 372.19
Relative Intensity (%)
m/z

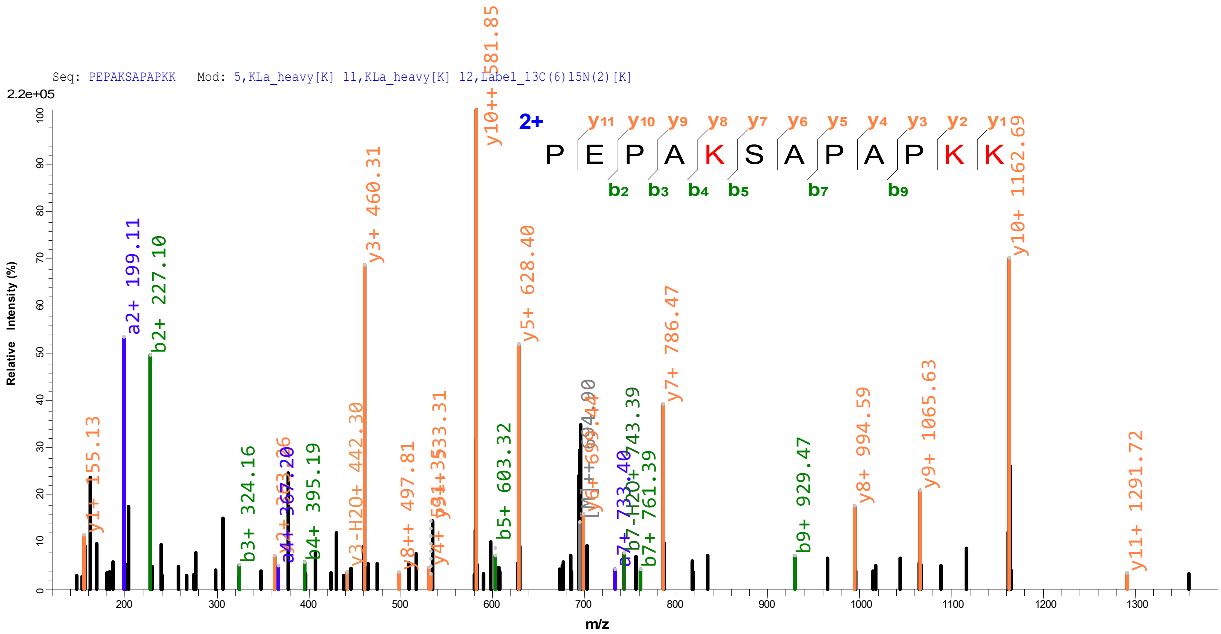
H2B

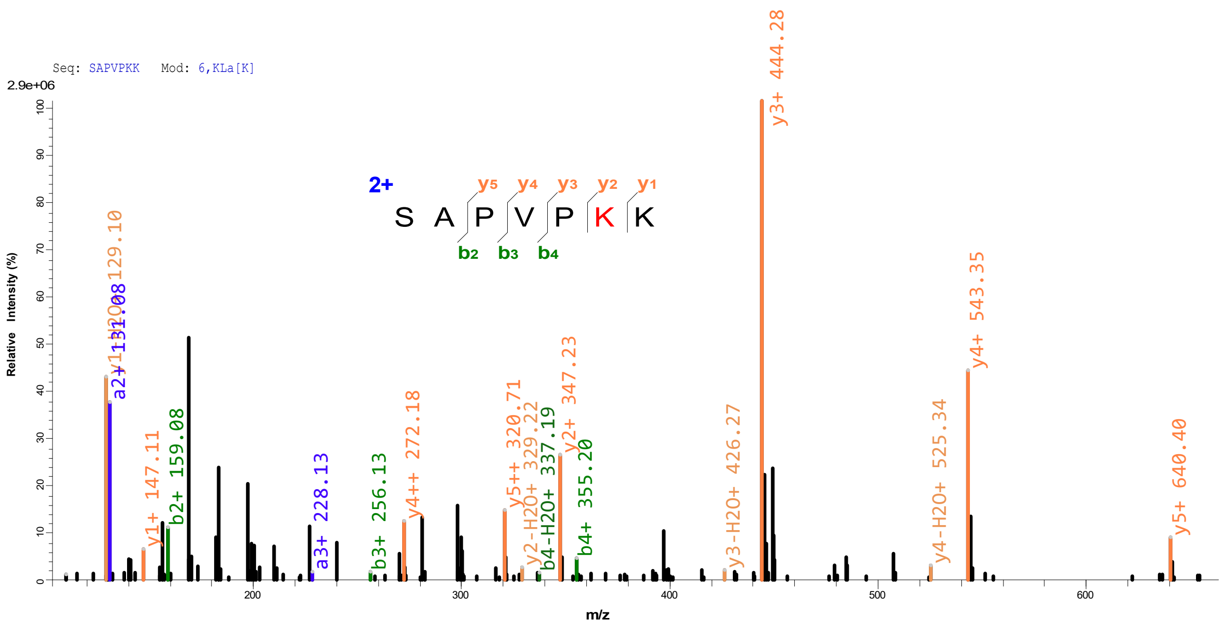

Seq: PDPAKSAPAPK Mod: 5,KLa[K]
2.7e+06
Relative Intensity (%)
m/z
2+
P D P A K S A P A P K
y9++ 469.77
y2+ 244.17
b2+ 213.09
y1+ 147.11
b3+ 310.14
b4+ 381.18
y4++ 412.26
y8++ 421.24
y5+ 483.29
y10++ 527.28
y6+ 570.32
[M]++ 581.29
b5+ 625.32
b6+ 668.32
b7+ 739.36
y7+ 770.44
y8+ 841.48
b9+ 907.45
y9+ 938.53
y10+ 1053.56

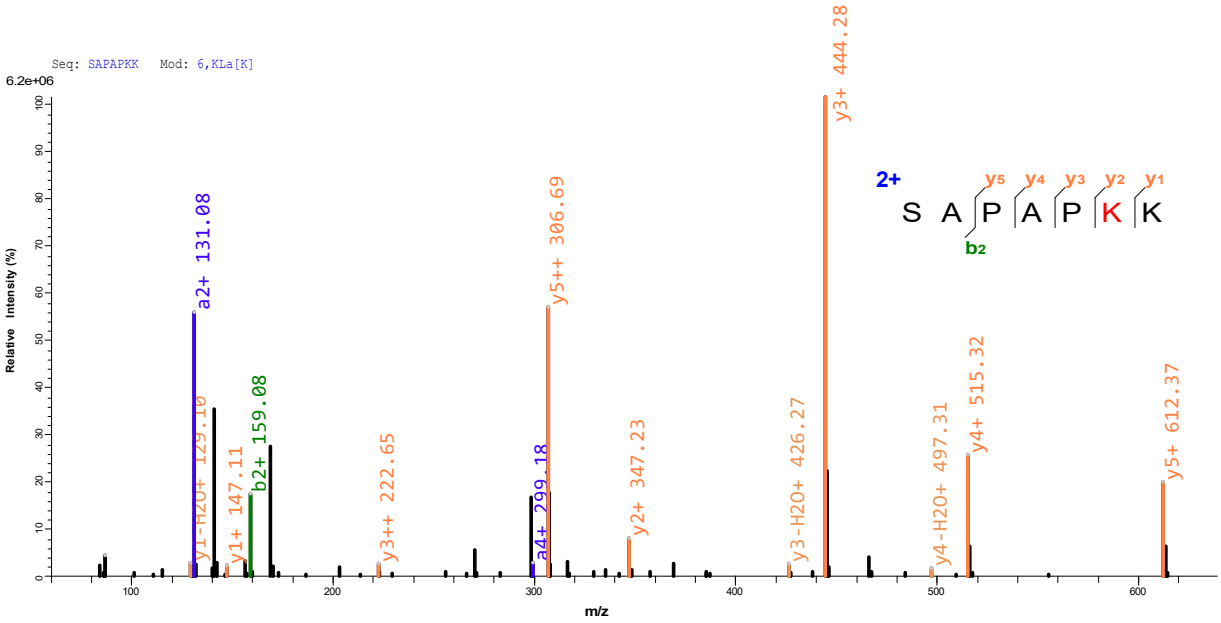

Seq: PEPTKSAPAPK Mod: 5,KLa[K]
1.5e+07
Relative Intensity (%)
m/z
2+
P E P T K S A P A P K
a2+ 199.11
y9++ 484.77
y9+ 968.54
b2+ 227.10
y2+ 244.17
y1+ 147.11
y3+ 315.20
y7++ 385.72
y4+ 412.26
y8++ 436.25
y5+ 483.29
y10++ 549.30
y6+ 570.32
[M]++ 597.82
b5+ 625.32
b6+ 712.35
y7+ 770.44
b7+ 783.39
y8+ 871.49
b8+ 880.44
a9+ 923.49
b9+ 951.51
y10+ 1097.58

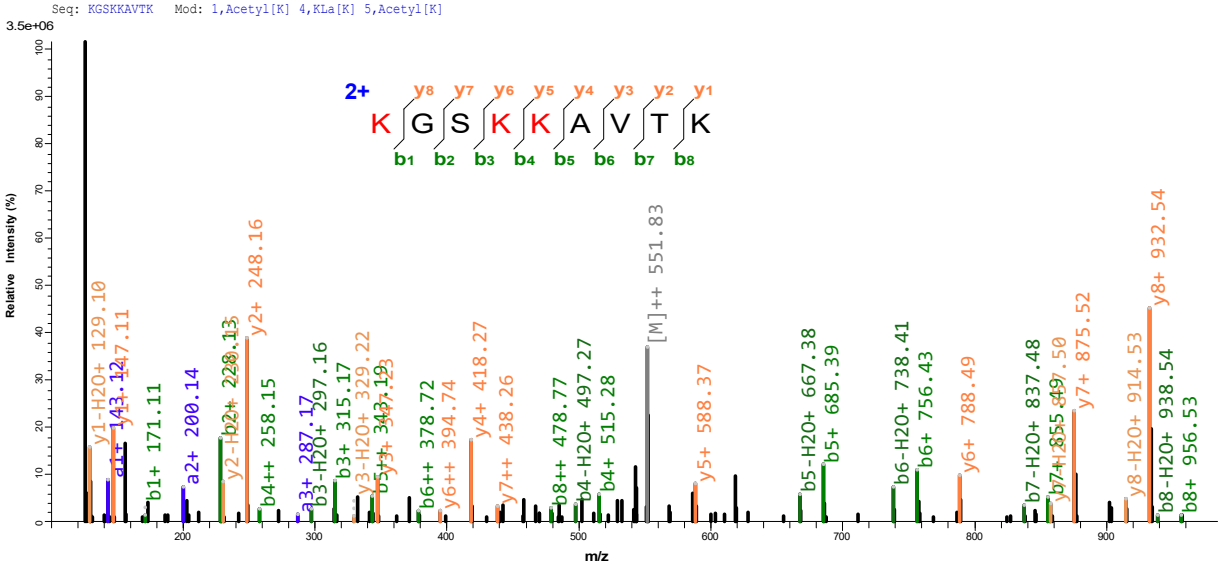

Seq: PEPVKSAPVPK Mod: 5,KLa[K]
7.6e+06
Relative Intensity (%)
m/z
2+
P E P V K S A P V P K
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b4 b5 b6 b7 b8 b9
y2+ 244.17
a2+ 199.11
b2+ 227.10
y1+ 147.11
b3+ 324.15
y3+ 343.23
a4+ 395.23
b4+ 423.22
y8++ 449.28
y4+ 440.29
y9++ 497.80
y5+ 511.32
a5+ 595.34
[M]++ 610.85
b5+ 623.34
b6+ 710.37
a7+ 753.43
b7+ 781.41
y7+ 798.47
b8+ 878.46
y8+ 897.54
a9+ 949.54
b9+ 977.53
y9+ 994.59
y10+ 1123.64

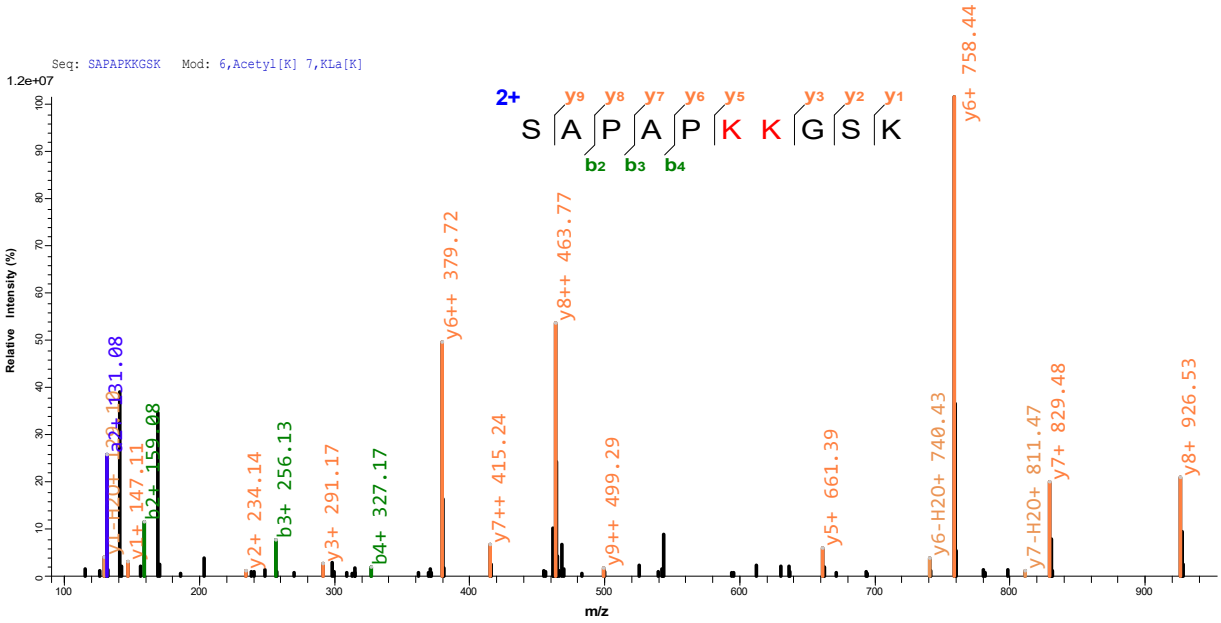

Seq: PDPAKSAPAPKK Mod: 5,Acetyl[K] 12,KLa[K]
2.8e+05
Relative Intensity (%)
m/z
2+
P D P A K S A P A P K K
y11 y10 y9 y8 y7 y6 y5 y4 y3 y2
b2 b3 b4 b5 b6 b7 b9
a2+ 185.09
b2+ 213.09
b3+ 310.14
a4+ 353.18
b4+ 381.18
y3+ 444.28
y8++ 470.78
y4+ 515.32
y10++ 554.82
b5+ 551.28
y5+ 612.37
b6+ 638.32
[M]++ 660.86
b7-H2O+ 683.41
b7+ 709.35
y7+ 770.44
a9+ 849.45
b9+ 877.44
y8+ 940.55
y9+ 1011.58
y10+ 1108.64
y11+ 1223.66

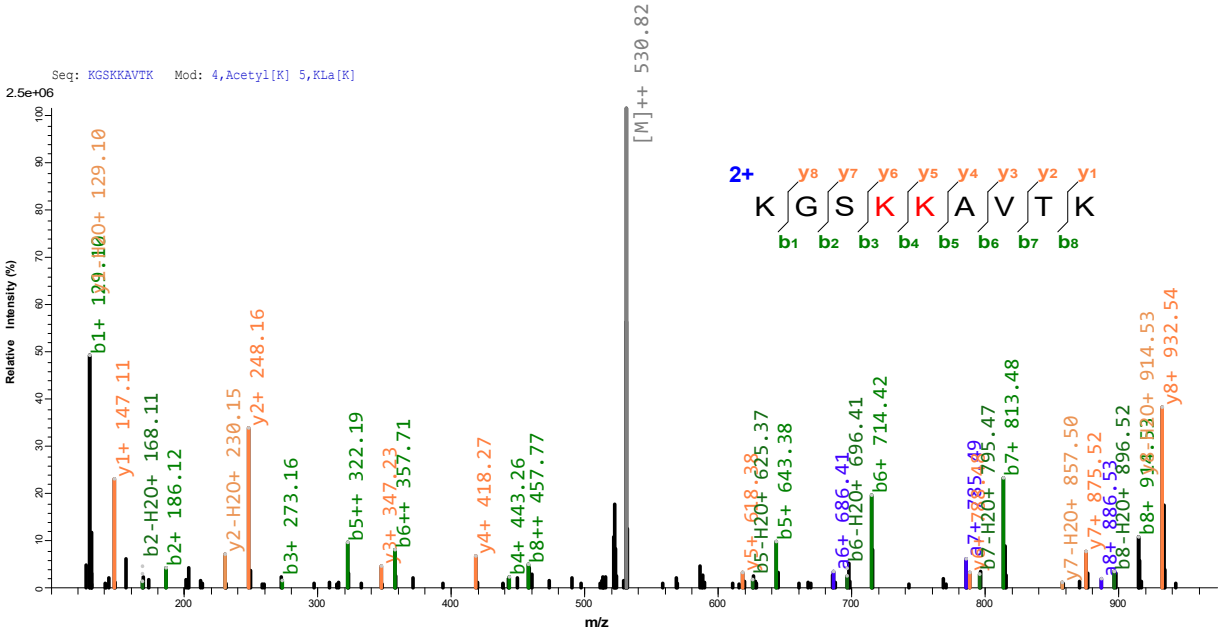

Seq: PEPAKSAPAPKK Mod: 5,KLa_heavy[K] 11,KLa_heavy[K] 12,Label_13C(6)15N(2)[K]
2.2e+05
Relative Intensity (%)
m/z
2+
P E P A K S A P A P K K
y11 y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b4 b5 b7 b9
y10++ 581.85
y10+ 1162.69
y3+ 460.31
a2+ 199.11
b2+ 227.10
y5+ 628.40
y7+ 786.47
y9+ 1065.63
y8+ 994.59
y1+ 155.13
b3+ 324.16
b4+ 395.19
y3-H2O+ 442.30
y8++ 497.81
b5+ 603.32
b9+ 929.47
y11+ 1291.72
a7+ 733.40
b7+ 761.39
743.39

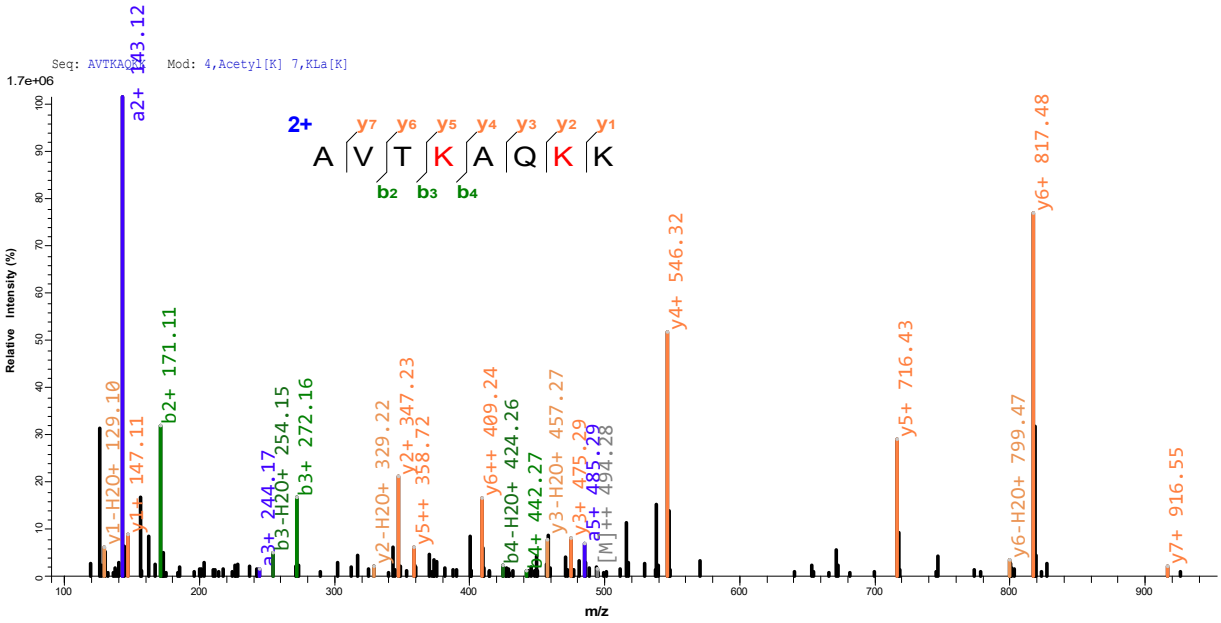

Seq: SAPVPKK Mod: 6,KLa[K]
2.9e+06
Relative Intensity (%)
m/z
2+
S A P V P K K
y5 y4 y3 y2 y1
b2 b3 b4
y3+ 444.28
y4+ 543.35
a2+ 131.08
129.10
y1+ 147.11
b2+ 159.08
a3+ 228.13
b3+ 256.13
y4++ 272.18
y5++ 320.71
y2-H2O+ 329.22
b4-H2O+ 337.19
y2+ 347.23
b4+ 355.20
y3-H2O+ 426.27
y4-H2O+ 525.34
y5+ 640.40

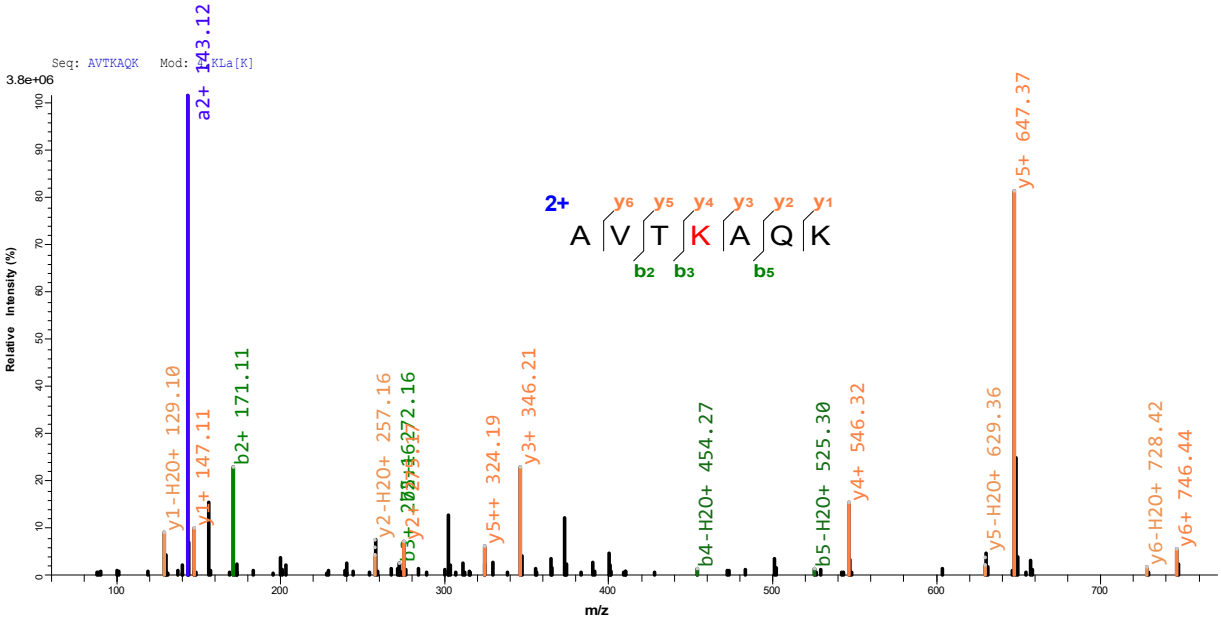

Seq: SAPAPKK Mod: 6,KLa[K]
6.2e+06
Relative Intensity (%)
m/z
2+
S A P A P K K
y5 y4 y3 y2 y1
b2
y3+ 444.28
y5++ 306.69
a2+ 131.08
b2+ 159.08
y1+ 147.11
y3++ 222.65
a4+ 299.18
y2+ 347.23
y3-H2O+ 426.27
y4-H2O+ 497.31
y4+ 515.32
y5+ 612.37

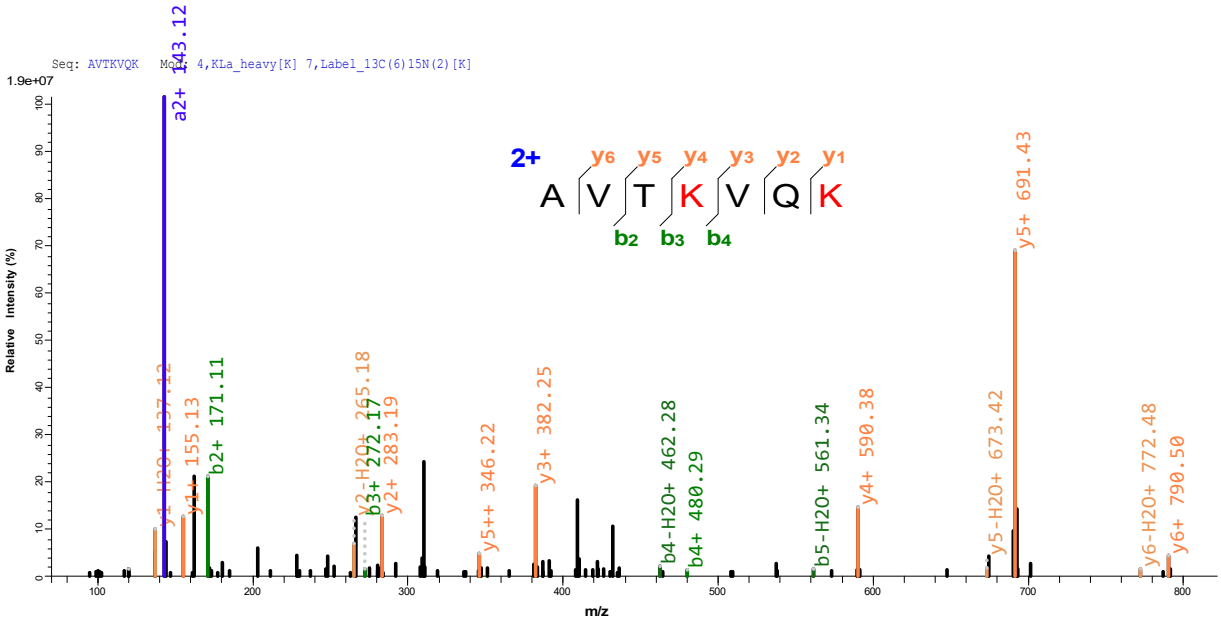

Seq: KGSKKAVTK Mod: 1,Acetyl[K] 4,KLa[K] 5,Acetyl[K]
3.5e+06
Relative Intensity (%)
m/z
2+
K G S K K A V T K
y8 y7 y6 y5 y4 y3 y2 y1
b1 b2 b3 b4 b5 b6 b7 b8
[M]++ 551.83
y2+ 248.16
y8+ 932.54
y7+ 875.52
b6-H2O+ 738.41
b5-H2O+ 667.38
b5+ 685.39
b6+ 756.43
y6+ 788.49
b7-H2O+ 837.48
y8-H2O+ 914.53
b8-H2O+ 938.54
b8+ 956.53
y5+ 588.37
y4+ 418.27
b4++ 258.15
b3+ 315.17
b6++ 378.72
y6++ 394.74
y7++ 438.26
b8++ 478.77
b4-H2O+ 497.27
b4+ 515.28
b1+ 171.11
a2+ 200.14

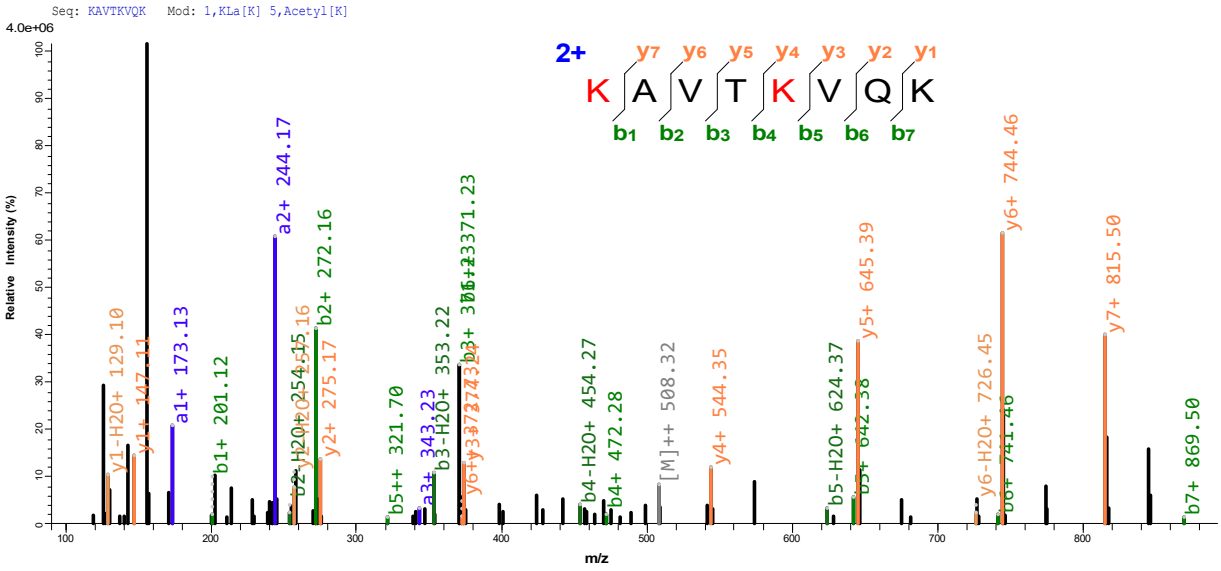

Seq: SAPAPKKGSK Mod: 6,Acetyl[K] 7,KLa[K]
1.2e+07
2+
S A P A P K K G S K
y9 y8 y7 y6 y5 y3 y2 y1
b2 b3 b4
Relative Intensity (%)
m/z
y6+ 758.44
y8++ 463.77
y6++ 379.72
y7++ 415.24
y9++ 499.29
y5+ 661.39
y6-H2O+ 740.43
y7-H2O+ 811.47
y7+ 829.48
y8+ 926.53
b3+ 256.13
b4+ 327.17
y3+ 291.17
y2+ 234.14
b2+ 159.08
y1+ 147.11

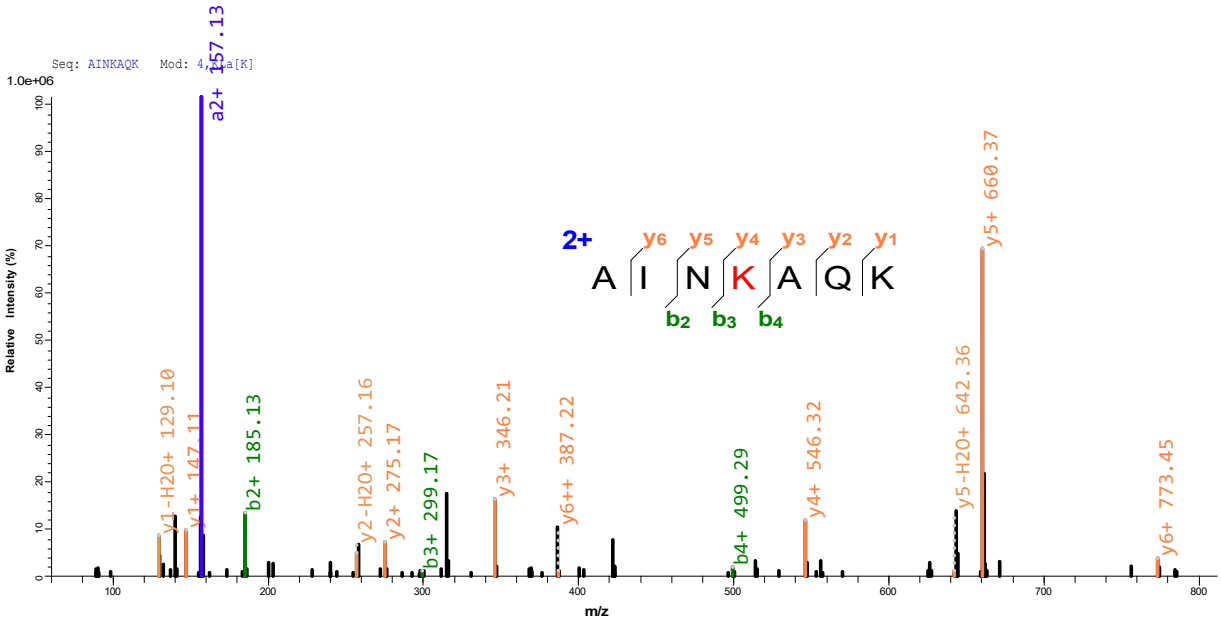

Seq: KGSKKAVTK Mod: 4,Acetyl[K] 5,KLa[K]
2.5e+06
2+
K G S K K A V T K
y8 y7 y6 y5 y4 y3 y2 y1
b1 b2 b3 b4 b5 b6 b7 b8
Relative Intensity (%)
m/z
[M]++ 530.82
b1+ 129.10
y1+ 147.11
b2-H2O+ 168.11
b2+ 186.12
y2-H2O+ 230.15
y2+ 248.16
b3+ 273.16
b5++ 322.19
y3+ 347.23
b6++ 357.71
y4+ 418.27
b4+ 443.26
b8++ 457.77
y5+ 618.38
b5-H2O+ 625.37
b5+ 643.38
a6+ 686.41
b6-H2O+ 696.41
b6+ 714.42
b7-H2O+ 795.47
b7+ 813.48
y7-H2O+ 857.50
y7+ 875.52
b8+ 914.53
y8+ 932.54

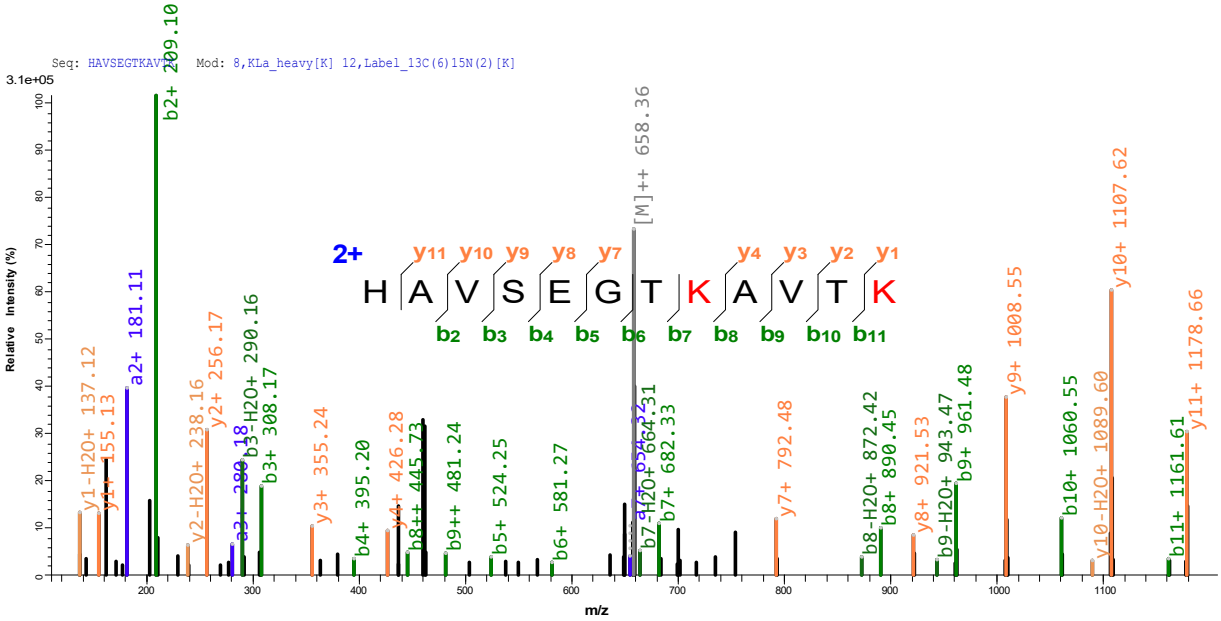

Seq: AVTKAQK Mod: 4,Acetyl[K] 7,KLa[K]
1.7e+06
Relative Intensity (%)
m/z
2+
A V T K A Q K K
y7 y6 y5 y4 y3 y2 y1
b2 b3 b4
a2+ 143.12
y1-H2O+ 129.10
y1+ 147.11
b2+ 171.11
a3+ 244.17
b3-H2O+ 254.15
b3+ 272.16
y2-H2O+ 329.22
y2+ 347.23
y5++ 358.72
y6++ 409.24
b4-H2O+ 424.26
b4+ 442.27
y3-H2O+ 457.27
y3+ 475.29
a5+ 485.29
[M]++ 494.28
y4+ 546.32
y5+ 716.43
y6+ 817.48
y6-H2O+ 799.47
y7+ 916.55

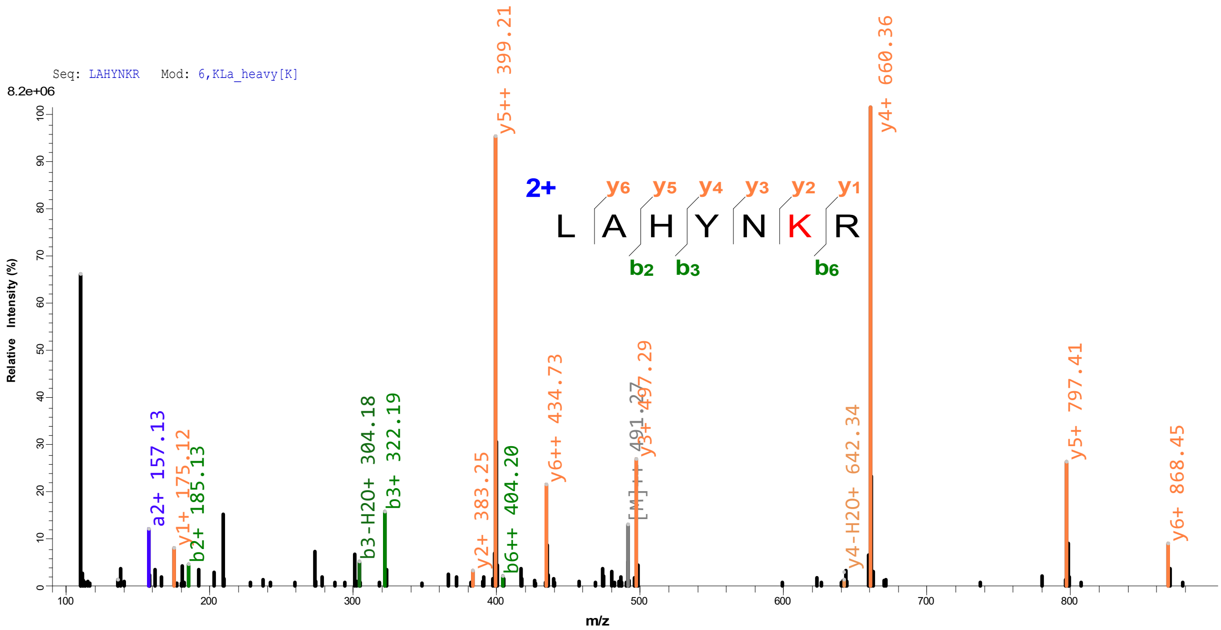

Seq: AVTKAQK Mod: KLa[K]
3.8e+06
Relative Intensity (%)
m/z
2+
A V T K A Q K
y6 y5 y4 y3 y2 y1
b2 b3 b5
a2+ 143.12
y1-H2O+ 129.10
y1+ 147.11
b2+ 171.11
y2-H2O+ 257.16
b3+ 272.16
y5++ 324.19
y3+ 346.21
b4-H2O+ 454.27
b5-H2O+ 525.30
y4+ 546.32
y5+ 647.37
y5-H2O+ 629.36
y6-H2O+ 728.42
y6+ 746.44

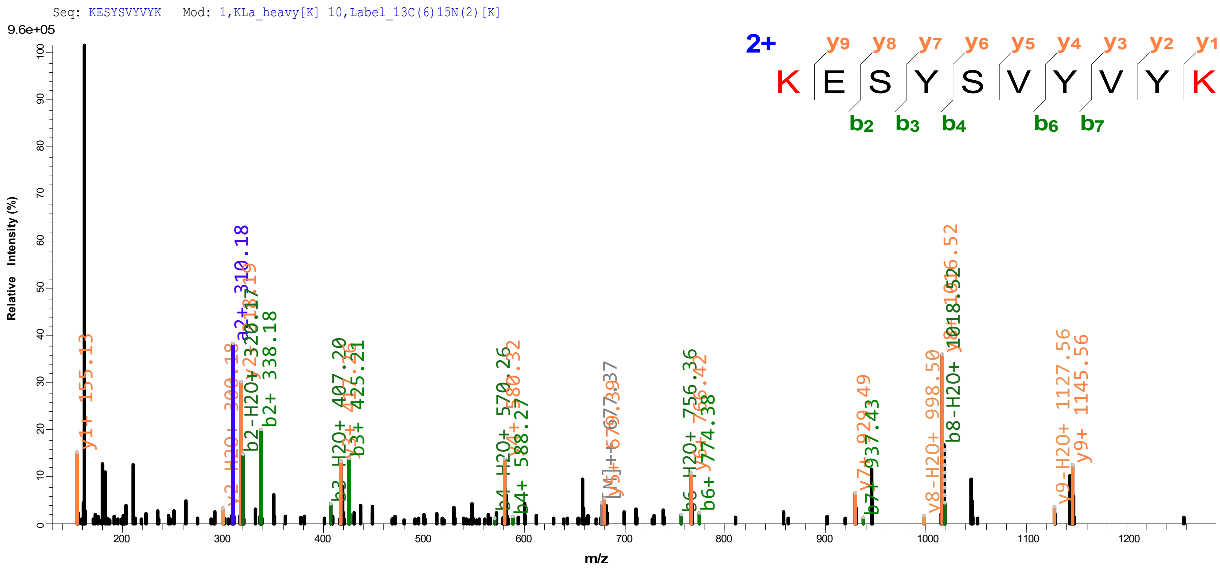

Seq: AVTKVQK Mod: 4,KLa_heavy[K] 7,Label_13C(6)15N(2)[K]
1.9e+07
Relative Intensity (%)
m/z
2+
A V T K V Q K
y6 y5 y4 y3 y2 y1
b2 b3 b4
a2+ 143.12
y1-H2O+ 137.12
y1+ 155.13
b2+ 171.11
y2-H2O+ 265.18
b3+ 272.17
y2+ 283.19
y5++ 346.22
y3+ 382.25
b4-H2O+ 462.28
b4+ 480.29
b5-H2O+ 561.34
y4+ 590.38
y5+ 691.43
y5-H2O+ 673.42
y6-H2O+ 772.48
y6+ 790.50

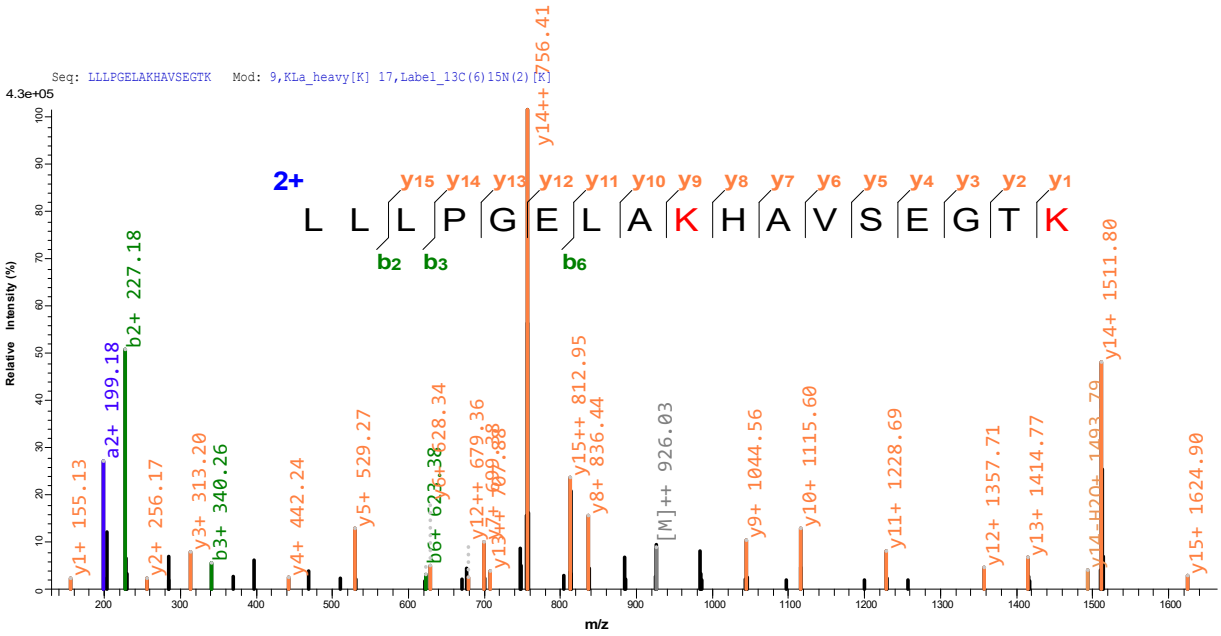

Seq: KAVTKVQK Mod: 1,KLa[K] 5,Acetyl[K]
4.0e+06
Relative Intensity (%)
m/z
2+
K A V T K V Q K
y7 y6 y5 y4 y3 y2 y1
b1 b2 b3 b4 b5 b6 b7
y1-H2O+ 129.10
y1+ 147.11
a1+ 173.13
b1+ 201.12
a2+ 244.17
b2-H2O+ 254.15
b2+ 272.16
y2+ 275.17
b5++ 321.70
a3+ 343.23
b3-H2O+ 353.22
b4-H2O+ 454.27
b4+ 472.28
[M]++ 508.32
y4+ 544.35
b5-H2O+ 624.37
y5+ 645.39
y6-H2O+ 726.45
y6+ 744.46
y7+ 815.50
b7+ 869.50

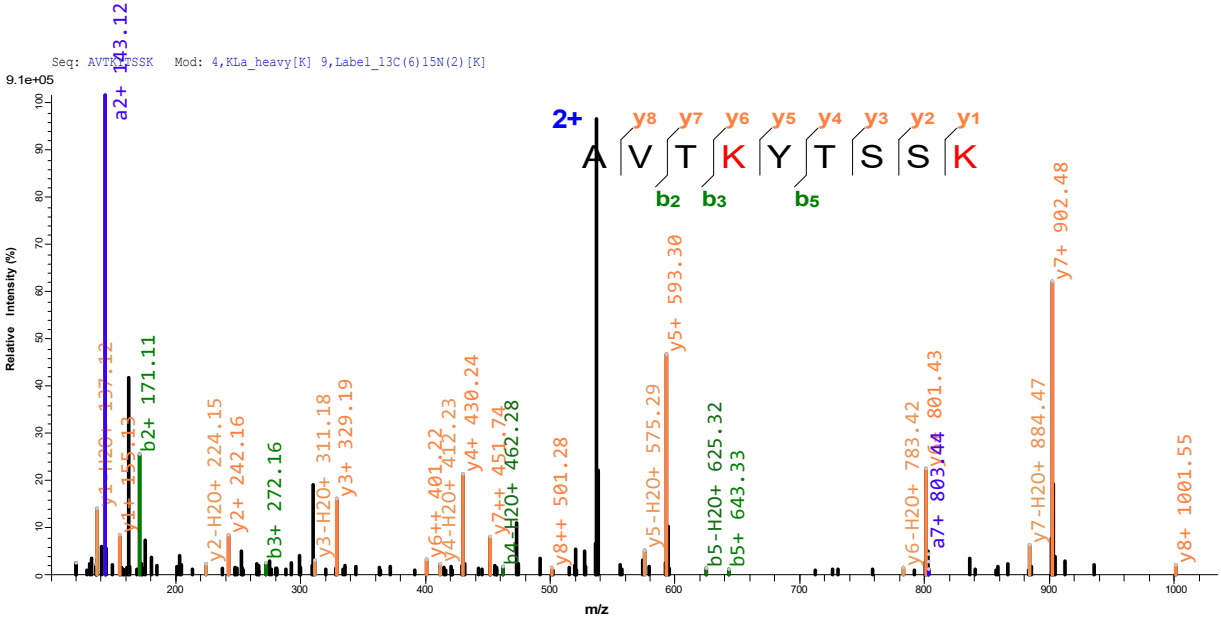

Seq: AINKAQK Mod: 4,KLa[K]
1.0e+06
Relative Intensity (%)
m/z
2+
A I N K A Q K
y6 y5 y4 y3 y2 y1
b2 b3 b4
a2+ 157.13
y1-H2O+ 129.10
y1+ 147.11
b2+ 185.13
y2-H2O+ 257.16
y2+ 275.17
b3+ 299.17
y3+ 346.21
y6++ 387.22
b4+ 499.29
y4+ 546.32
y5-H2O+ 642.36
y5+ 660.37
y6+ 773.45


Seq: HAVSEGTKAVTK Mod: 8,KLa_heavy[K] 12,Label_13C(6)15N(2)[K]
3.1e+05
Relative Intensity (%)
m/z
2+
H A V S E G T K A V T K
y11 y10 y9 y8 y7 y4 y3 y2 y1
b2 b3 b4 b5 b6 b7 b8 b9 b10 b11
b2+ 209.10
y1-H2O+ 137.12
y1+ 155.13
a2+ 181.11
y2-H2O+ 238.16
y2+ 256.17
a3+ 280.18
b3-H2O+ 290.16
b3+ 308.17
y3+ 355.24
b4+ 395.20
y4+ 426.28
b8++ 445.73
b9++ 481.24
b5+ 524.25
b6+ 581.27
[M]++ 658.36
b7-H2O+ 664.31
b7+ 682.33
y7+ 792.48
b8-H2O+ 872.42
b8+ 890.45
y8+ 921.53
b9-H2O+ 943.47
b9+ 961.48
y9+ 1008.55
b10+ 1060.55
y10-H2O+ 1089.60
y10+ 1107.62
b11+ 1161.61
y11+ 1178.66

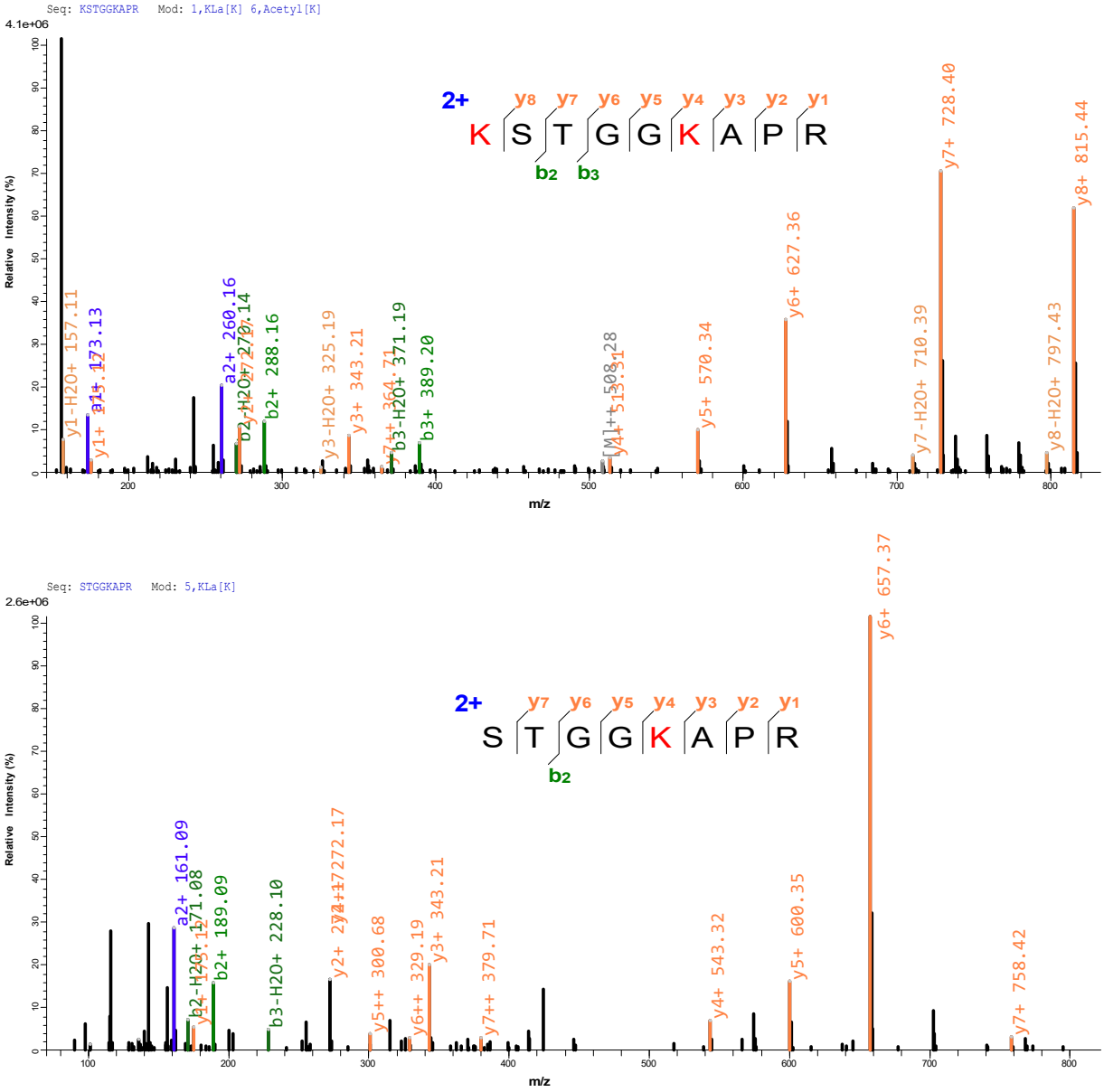

Seq: LAHYNKR Mod: 6,KLa_heavy[K]
8.2e+06
Relative Intensity (%)
m/z
2+
L A H Y N K R
y6 y5 y4 y3 y2 y1
b2 b3 b6
y5++ 399.21
y4+ 660.36
a2+ 157.13
y1+ 175.12
b2+ 185.13
b3-H2O+ 304.18
b3+ 322.19
y2+ 383.25
b6++ 404.20
y6++ 434.73
y3+ 497.29
y4-H2O+ 642.34
y5+ 797.41
y6+ 868.45

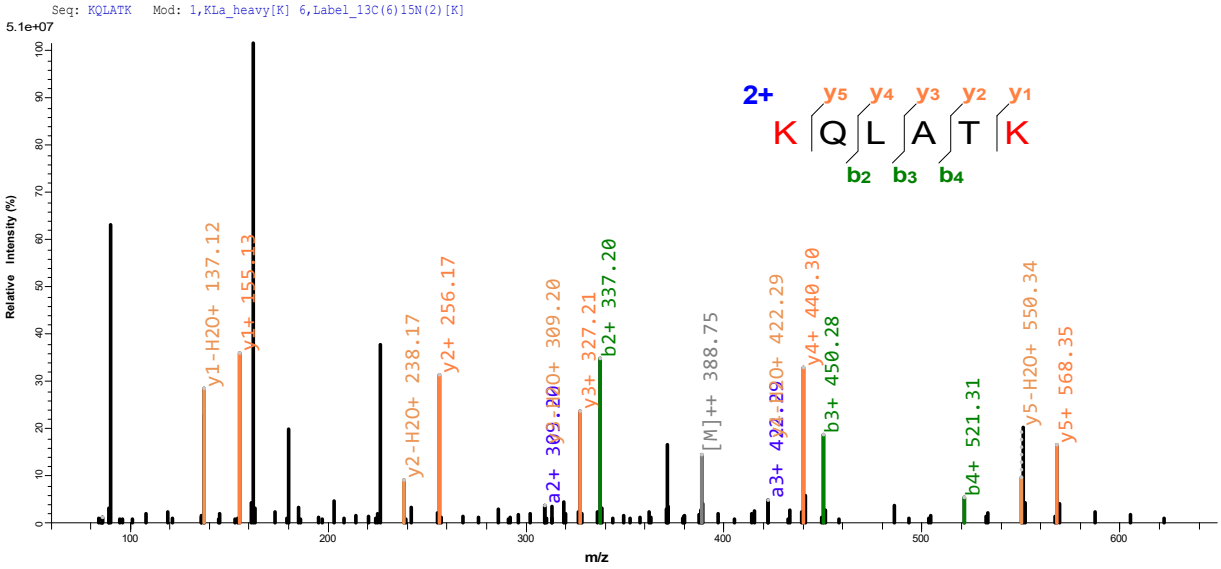

Seq: KESYSVYVYK Mod: 1,KLa_heavy[K] 10,Label_13C(6)15N(2)[K]
9.6e+05
Relative Intensity (%)
m/z
2+
K E S Y S V Y V Y K
y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b4 b6 b7
a2+ 310.18
b2-H2O+ 320.17
b2+ 338.18
b3+ 425.21
b8-H2O+ 1018.52
y9+ 1145.56

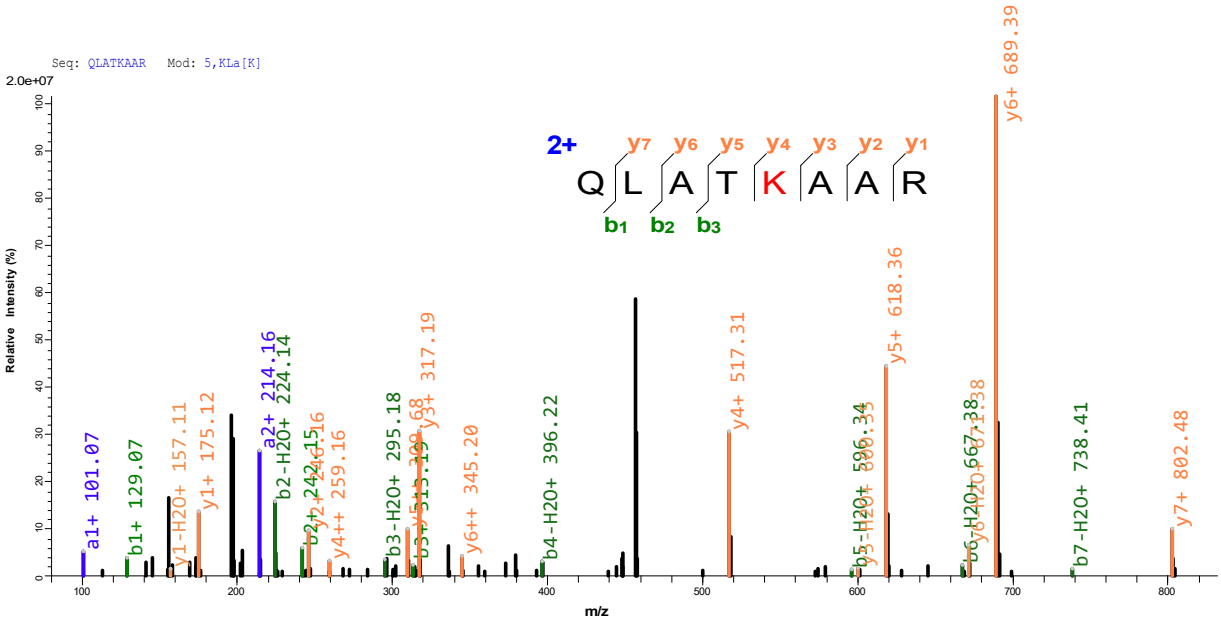

Seq: LLLPGELAKHAVSEGTK Mod: 9,KLa_heavy[K] 17,Label_13C(6)15N(2)[K]
4.3e+05
Relative Intensity (%)
m/z
2+
L L L P G E L A K H A V S E G T K
y15 y14 y13 y12 y11 y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b6
y14++ 756.41
a2+ 199.18
b2+ 227.18
y1+ 155.13
y2+ 256.17
y3+ 313.20
b3+ 340.26
y4+ 442.24
y5+ 529.27
b6+ 623.38
y8+ 828.34
y12++ 679.36
y15++ 812.95
y8+ 836.44
[M]++ 926.03
y9+ 1044.56
y10+ 1115.60
y11+ 1228.69
y12+ 1357.71
y13+ 1414.77
y14+ 1511.80
y15+ 1624.90

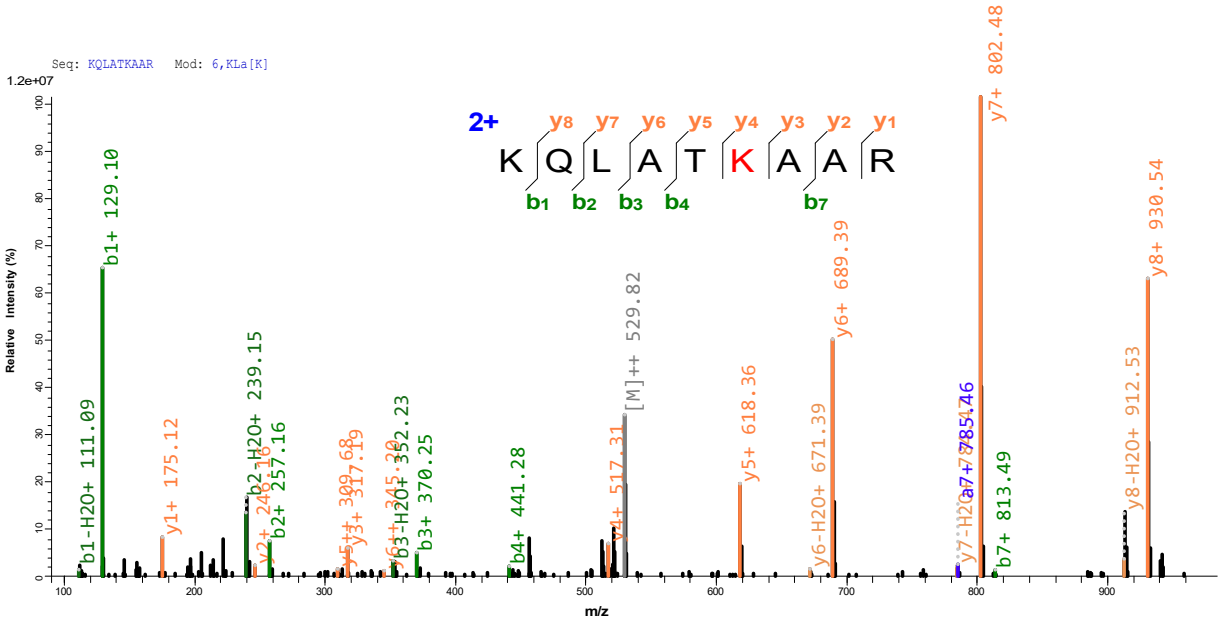

Seq: AVTKYTSSK Mod: 4,KLa_heavy[K] 9,Label_13C(6)15N(2)[K]
9.1e+05
Relative Intensity (%)
m/z
2+
A V T K Y T S S K
y8 y7 y6 y5 y4 y3 y2 y1
b2 b3 b5
a2+ 143.12
y1-H2O+ 137.12
b2+ 171.11
y1+ 155.13
y2-H2O+ 224.15
y2+ 242.16
b3+ 272.16
y3-H2O+ 311.18
y3+ 329.19
y6++ 401.22
y4-H2O+ 412.23
y4+ 430.24
y7++ 451.74
b4-H2O+ 462.28
y8++ 501.28
y5-H2O+ 575.29
y5+ 593.30
b5-H2O+ 625.32
b5+ 643.33
y6-H2O+ 783.42
a7+ 803.44
y6+ 801.43
y7-H2O+ 884.47
y7+ 902.48
y8+ 1001.55

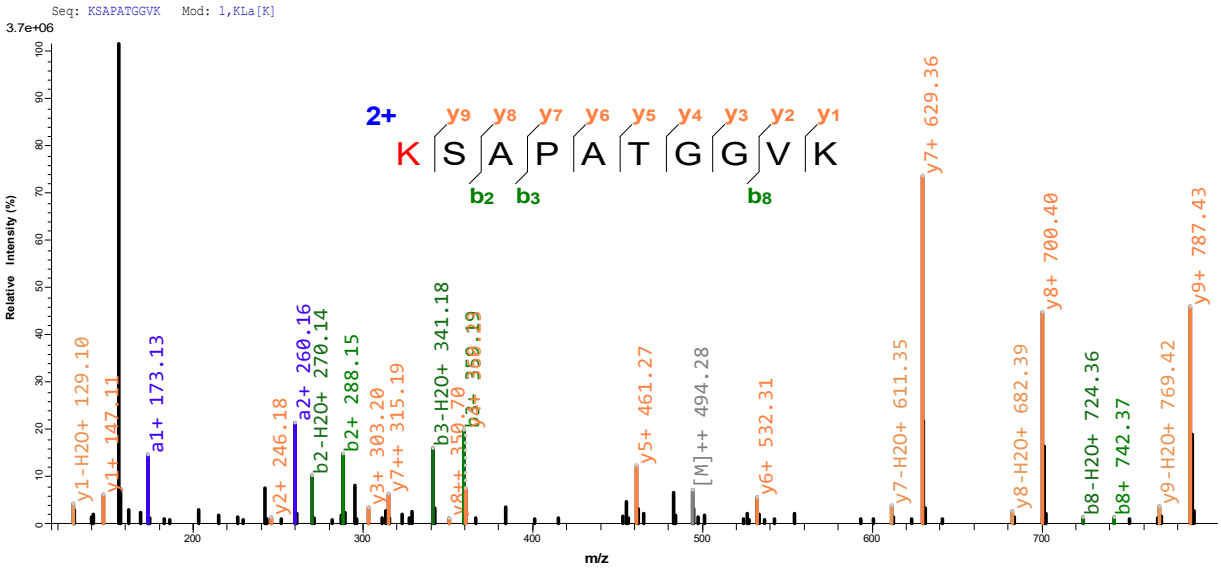
H3

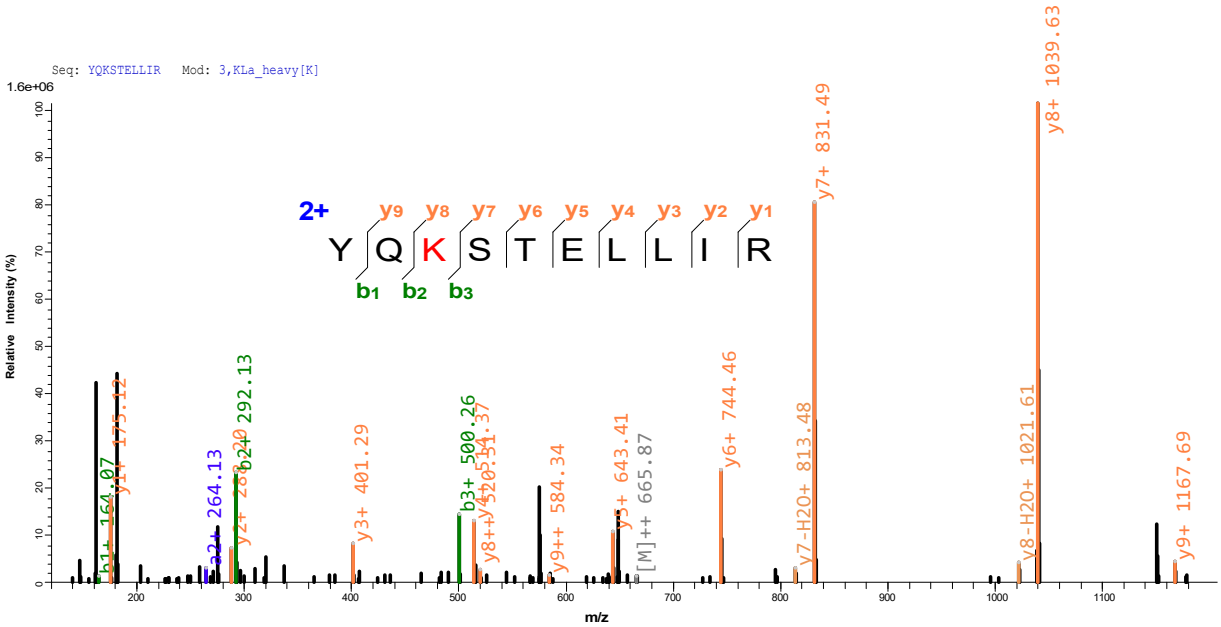

Seq: KSTGGKAPR Mod: 1,KLa[K] 6,Acetyl[K]
4.1e+06
2+
y8 y7 y6 y5 y4 y3 y2 y1
K S T G G K A P R
b2 b3
Relative Intensity (%)
m/z
y1-H2O+ 157.11
y1+ 175.12
a1+ 173.13
a2+ 260.16
b2-H2O+ 270.14
b2+ 288.16
y3-H2O+ 325.19
y3+ 343.21
y7++ 364.71
b3-H2O+ 371.19
b3+ 389.20
y4++ 508.28
y4+ 513.31
y5+ 570.34
y6+ 627.36
y7-H2O+ 710.39
y7+ 728.40
y8-H2O+ 797.43
y8+ 815.44
Seq: STGGKAPR Mod: 5,KLa[K]
2.6e+06
2+
y7 y6 y5 y4 y3 y2 y1
S T G G K A P R
b2
Relative Intensity (%)
m/z
a2+ 161.09
b2-H2O+ 171.08
y1+ 175.12
b2+ 189.09
b3-H2O+ 228.10
y2+ 274.17
y2++ 137.09
y5++ 300.68
y6++ 329.19
y3+ 343.21
y7++ 379.71
y4+ 543.32
y5+ 600.35
y6+ 657.37
y7+ 758.42

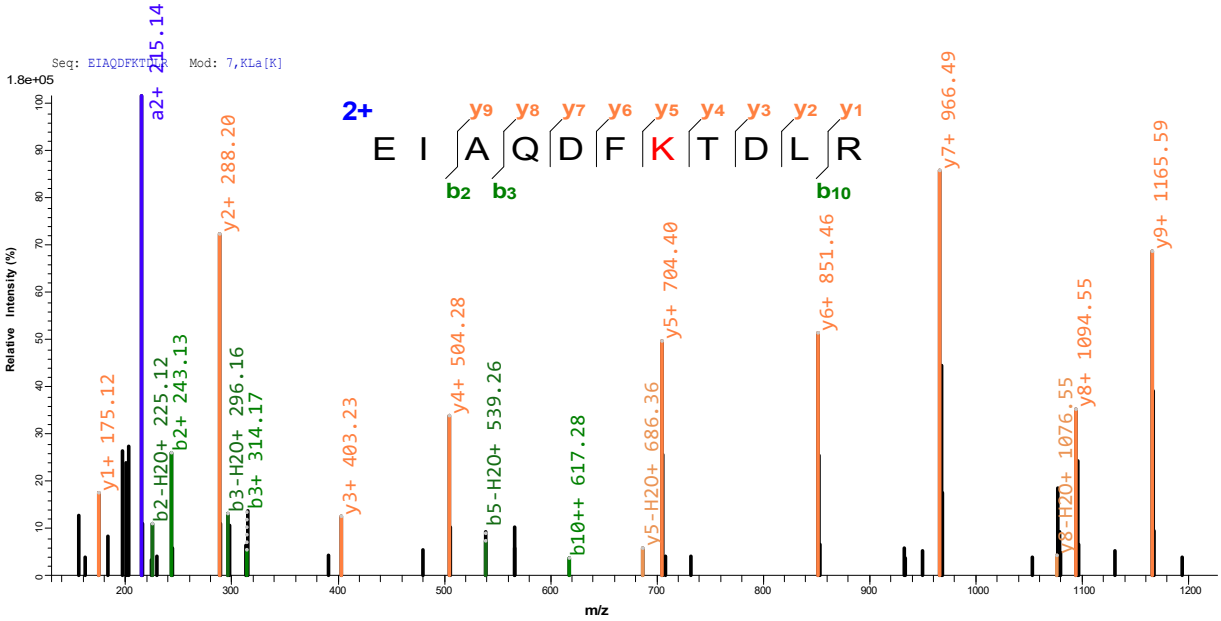

Seq: KQLATK Mod: 1,KLa_heavy[K] 6,Label_13C(6)15N(2)[K]
5.1e+07
Relative Intensity (%)
m/z
2+
y5 y4 y3 y2 y1
K Q L A T K
b2 b3 b4
y1-H2O+ 137.12
y1+ 155.13
y2-H2O+ 238.17
y2+ 256.17
a2+ 309.20
b2+ 337.20
y3+ 327.21
[M]++ 388.75
a3+ 422.29
y4+ 440.30
b3+ 450.28
b4+ 521.31
y5-H2O+ 550.34
y5+ 568.35

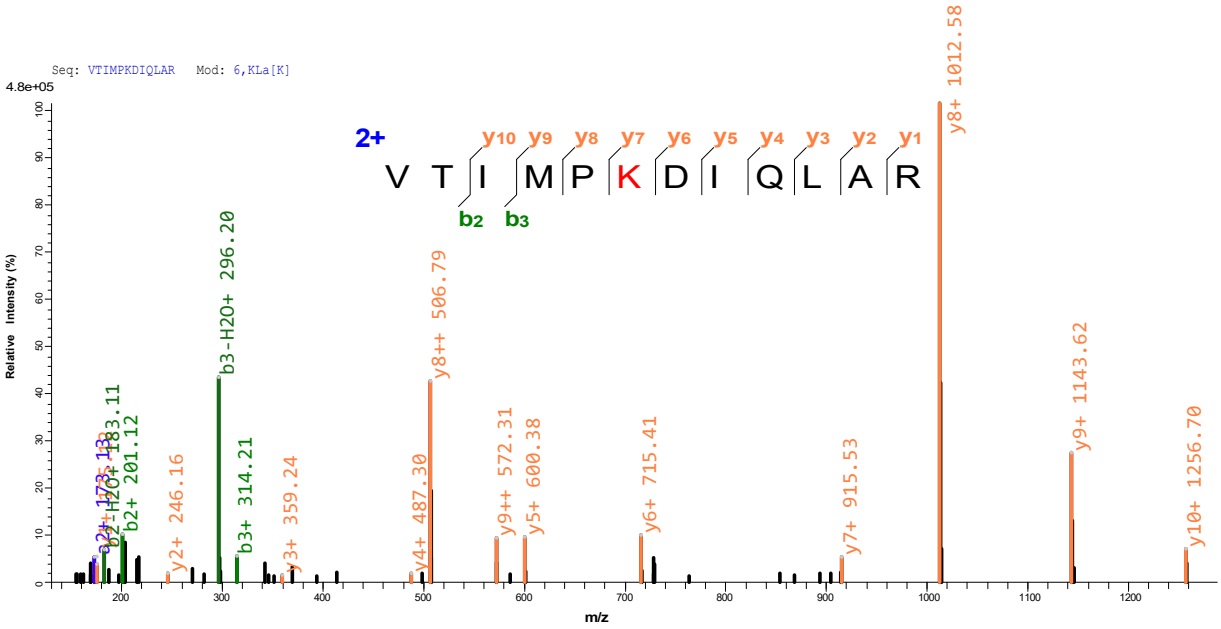

Seq: QLATKAAR Mod: 5,KLa[K]
2.0e+07
Relative Intensity (%)
m/z
2+
y7 y6 y5 y4 y3 y2 y1
Q L A T K A A R
b1 b2 b3
a1+ 101.07
b1+ 129.07
y1-H2O+ 157.11
y1+ 175.12
a2+ 214.16
b2-H2O+ 224.14
b2+ 242.15
y4++ 259.16
b3-H2O+ 295.18
y3+ 317.19
y6++ 345.20
b4-H2O+ 396.22
y4+ 517.31
y5+ 618.36
b5-H2O+ 596.34
b6-H2O+ 667.38
y6+ 689.39
b7-H2O+ 738.41
y7+ 802.48


Seq: KQLATKAAR Mod: 6,KLa[K]
1.2e+07
2+
y8 y7 y6 y5 y4 y3 y2 y1
K Q L A T K A A R
b1 b2 b3 b4 b7
Relative Intensity (%)
m/z
b1+ 129.10
b1-H2O+ 111.09
y1+ 175.12
b2-H2O+ 239.15
b2+ 257.16
y3+ 317.19
b3-H2O+ 352.23
b3+ 370.25
b4+ 441.28
[M]++ 529.82
y5+ 618.36
y6+ 689.39
y6-H2O+ 671.39
y7+ 802.48
y8+ 930.54
y8-H2O+ 912.53
b7+ 813.49

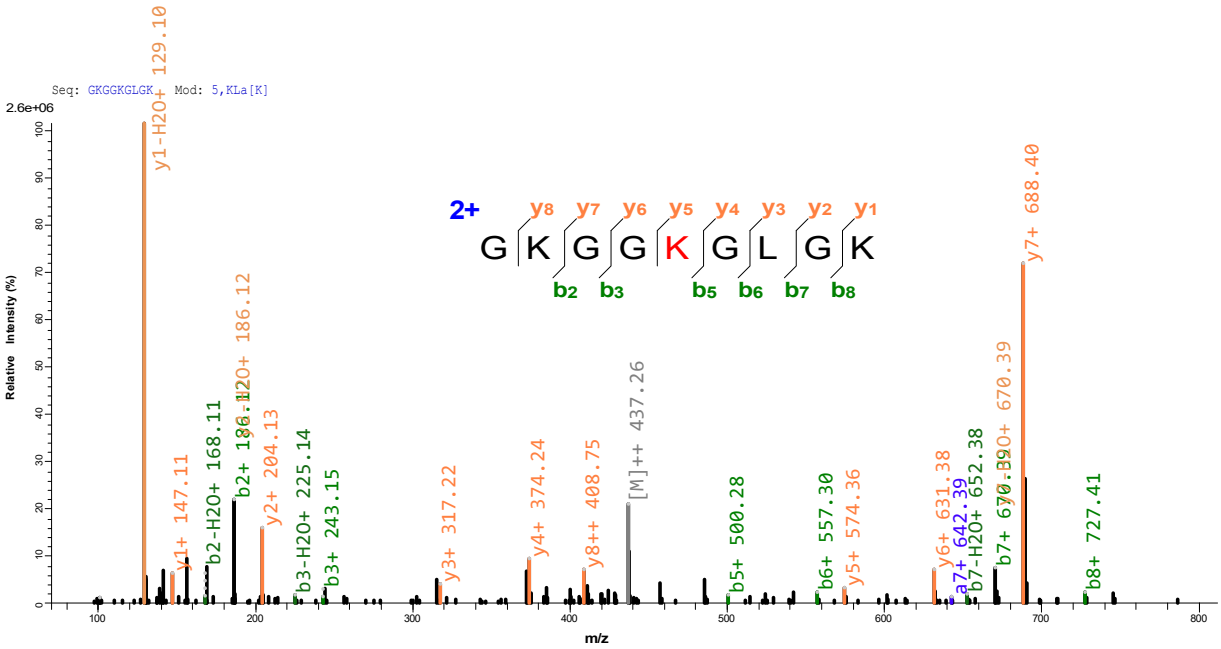

Seq: KSAPATGGVK Mod: 1,KLa[K]
3.7e+06
2+
y9 y8 y7 y6 y5 y4 y3 y2 y1
K S A P A T G G V K
b2 b3 b8
Relative Intensity (%)
m/z
y1-H2O+ 129.10
y1+ 147.11
a1+ 173.13
y2+ 246.18
a2+ 260.16
b2-H2O+ 270.14
b2+ 288.15
y3+ 303.20
y7++ 315.19
b3-H2O+ 341.18
y5+ 461.27
[M]++ 494.28
y6+ 532.31
y7+ 629.36
y7-H2O+ 611.35
y8-H2O+ 682.39
y8+ 700.40
b8-H2O+ 724.36
b8+ 742.37
y9-H2O+ 769.42
y9+ 787.43

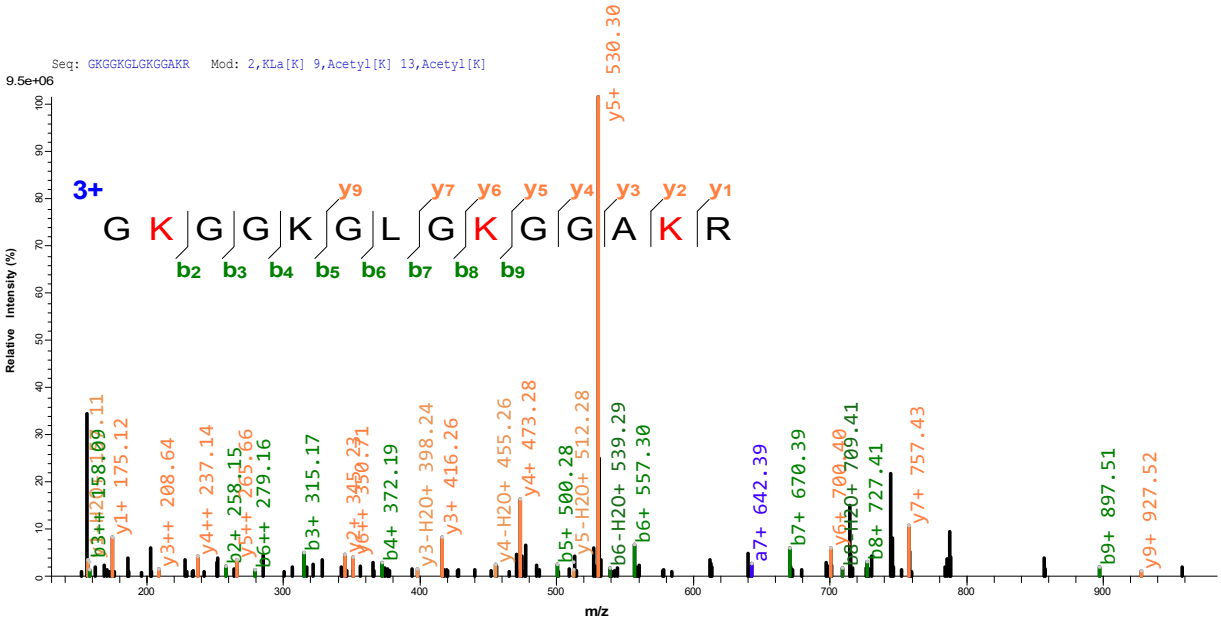

Seq: YQKSTELLIR Mod: 3,KLa_heavy[K]
1.6e+06
Relative Intensity (%)
m/z
2+
y9 y8 y7 y6 y5 y4 y3 y2 y1
Y Q K S T E L L I R
b1 b2 b3
y7+ 831.49
y8+ 1039.63
y6+ 744.46
y8-H2O+ 1021.61
y7-H2O+ 813.48
y9+ 1167.69
y5+ 643.41
[M]++ 665.87
y3+ 401.29
b3+ 500.26
y9++ 584.34
b2+ 292.13
a2+ 264.13
b1+ 164.07

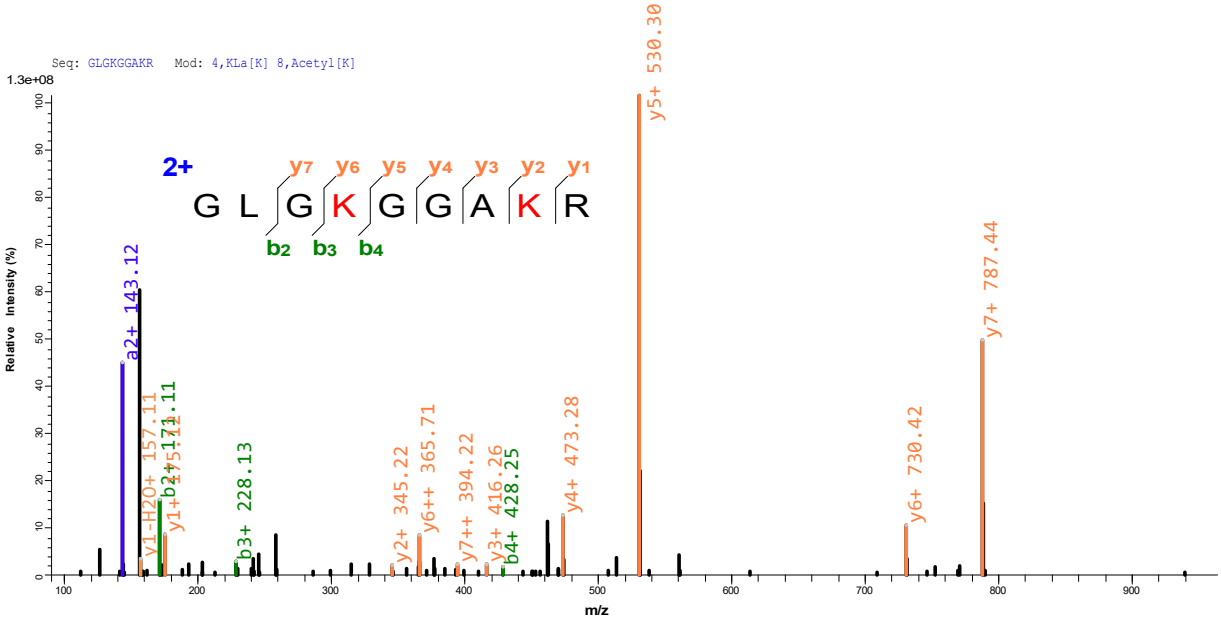

Seq: EIAQDFKTDLR Mod: 7,KLa[K]
1.8e+05
Relative Intensity (%)
m/z
2+
y9 y8 y7 y6 y5 y4 y3 y2 y1
E I A Q D F K T D L R
b2 b3 b10
a2+ 215.14
y7+ 966.49
y2+ 288.20
y9+ 1165.59
y6+ 851.46
y4+ 504.28
y5+ 704.40
y8+ 1094.55
y8-H2O+ 1076.55
y5-H2O+ 686.36
b5-H2O+ 539.26
y3+ 403.23
b10++ 617.28
b3-H2O+ 296.16
b2-H2O+ 225.12
b2+ 243.13
b3+ 314.17
y1+ 175.12


Seq: VTIMPKDIQLAR Mod: 6,KLa[K]
4.8e+05
2+
y10 y9 y8 y7 y6 y5 y4 y3 y2 y1
V T I M P K D I Q L A R
b2 b3
Relative Intensity (%)
m/z
y8+ 1012.58
b3-H2O+ 296.20
y8++ 506.79
y9+ 1143.62
y10+ 1256.70
b2+ 183.11
b2+ 201.12
y2+ 246.16
b3+ 314.21
y3+ 359.24
y4+ 487.30
y9++ 572.31
y5+ 600.38
y6+ 715.41
y7+ 915.53

H4


Seq: GKGGKGLGK Mod: 5,KLa[K]
2.6e+06
2+
y8 y7 y6 y5 y4 y3 y2 y1
G K G G K G L G K
b2 b3 b5 b6 b7 b8
Relative Intensity (%)
m/z
y1-H2O+ 129.10
y7+ 688.40
[M]++ 437.26
b2+ 186.12
b2-H2O+ 168.11
y1+ 147.11
y2+ 204.13
b3-H2O+ 225.14
b3+ 243.15
y3+ 317.22
y4+ 374.24
y8++ 408.75
b5+ 500.28
b6+ 557.30
y5+ 574.36
y6+ 631.38
a7+ 642.39
b7-H2O+ 652.38
b7+ 670.39
b8+ 727.41


Seq: GKGGKGLGKGGAKR Mod: 2,KLa[K] 9,Acetyl[K] 13,Acetyl[K]
9.5e+06
3+
G K G G K G L G K G G A K R
b2 b3 b4 b5 b6 b7 b8 b9
y9 y7 y6 y5 y4 y3 y2 y1
Relative Intensity (%)
m/z
y5+ 530.30
y1+ 175.12
y3++ 208.64
y4++ 237.14
b3+ 315.17
b4+ 372.19
y3+ 416.26
y4+ 473.28
b5+ 500.28
b6-H2O+ 539.29
b6+ 557.30
a7+ 642.39
b7+ 670.39
b8+ 727.41
y7+ 757.43
b9+ 897.51
y9+ 927.52


Seq: GLGKGGAKR Mod: 4,KLa[K] 8,Acetyl[K]
1.3e+08
2+
G L G K G G A K R
b2 b3 b4
y7 y6 y5 y4 y3 y2 y1
Relative Intensity (%)
m/z
y5+ 530.30
a2+ 143.12
y1-H2O+ 157.11
y1+ 175.11
b3+ 228.13
y2+ 345.22
y6++ 365.71
y7++ 394.22
y3+ 416.26
b4+ 428.25
y4+ 473.28
y6+ 730.42
y7+ 787.44