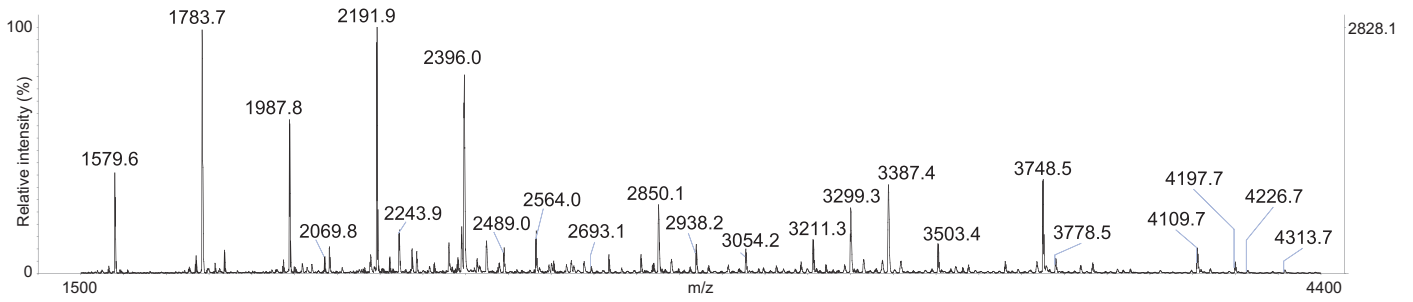


Supplementary for Sialic Acid Biosynthesis Impacts Hexosamine Pathway Metabolism and N-linked Glycan Structure

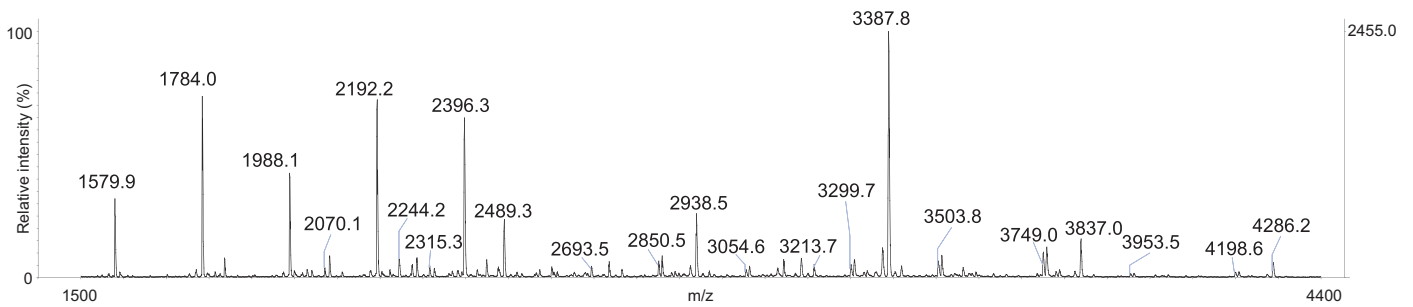
SUPPLEMENTARY FIGURE LEGENDS

Supplementary Figure 1. MALDI-MS analysis of K88, K20, +GNE, +D176V and +Kinase cells. Permethylated N-linked glycans from K88, K20, +GNE, +D176V and +Kinase cells were analyzed by MALDI-TOF mass spectrometry. All molecular ions are in form of $[M+Na]^+$.

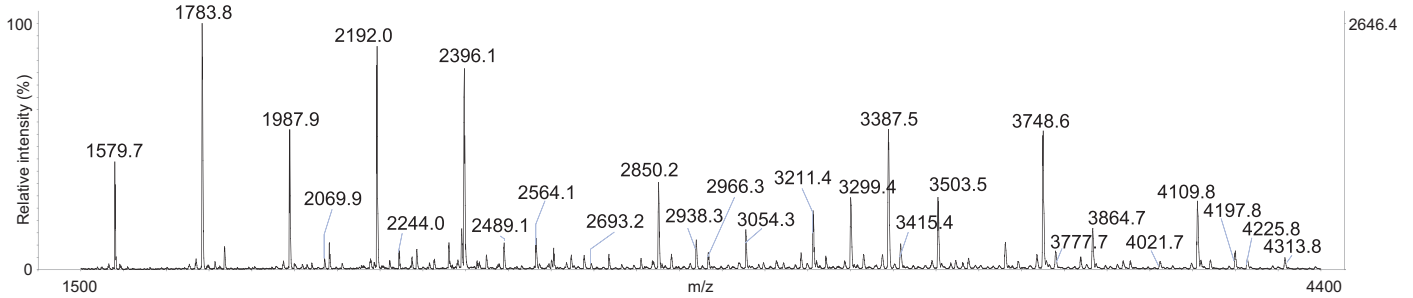
(1-1a) K88



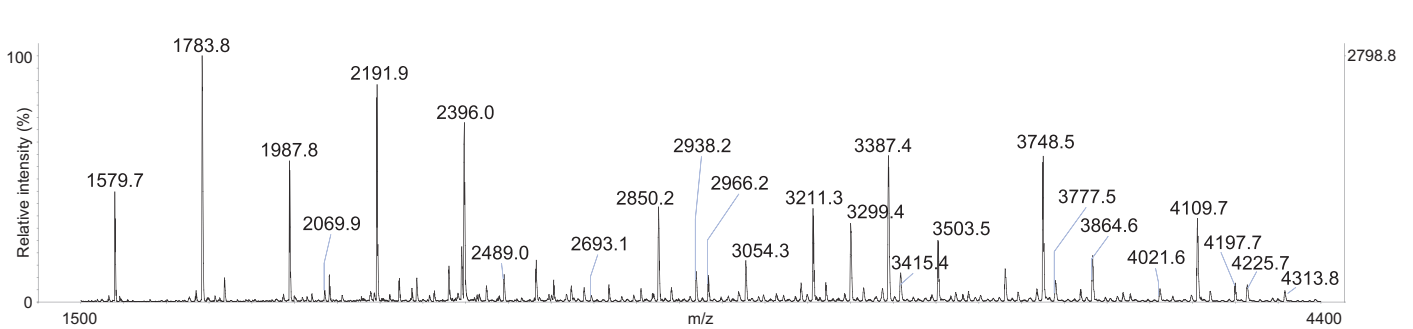
(1-2a) K20



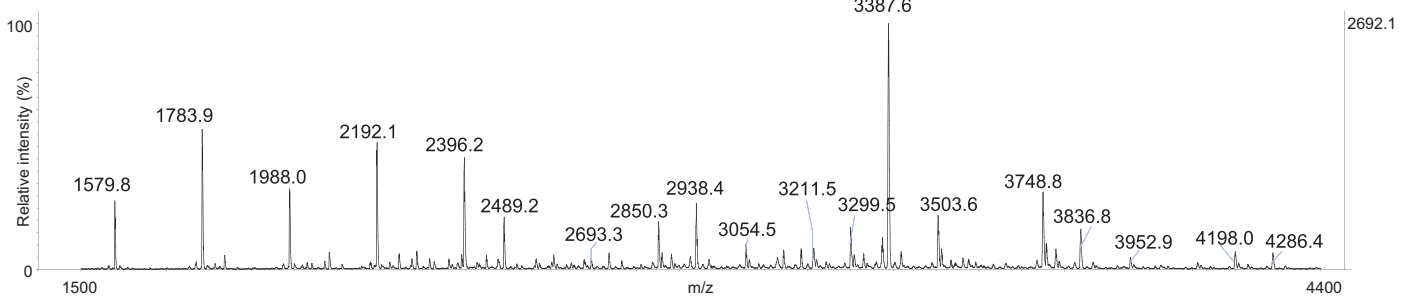
(1-3a) +GNE



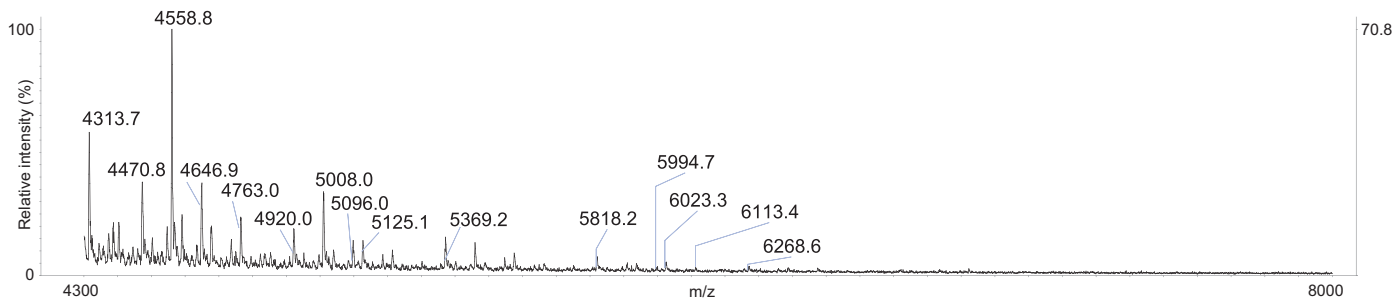
(1-4a) +D176V



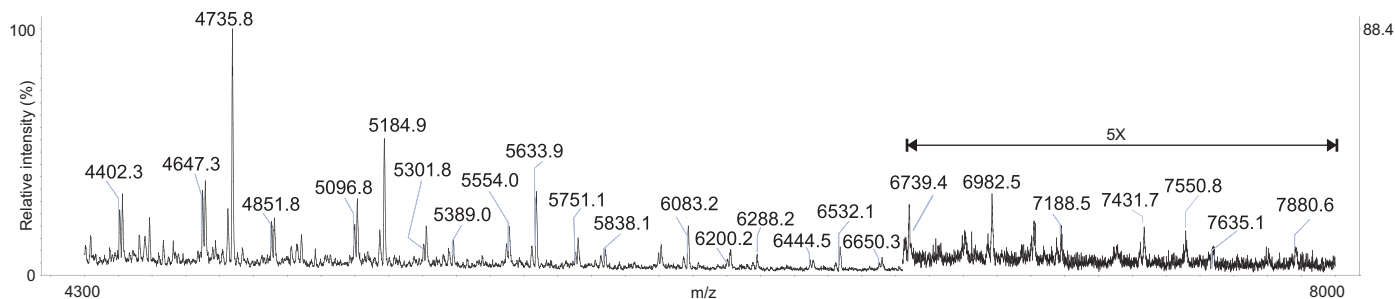
(1-5a) +Kinase



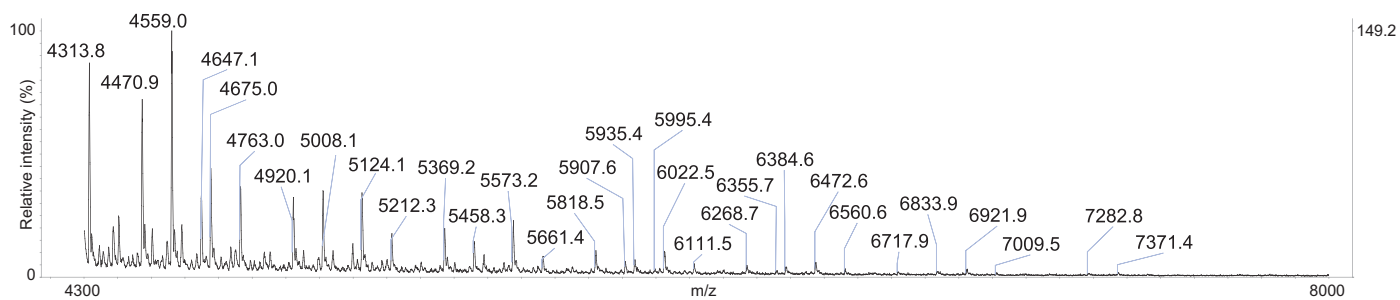
(1-1b) K88



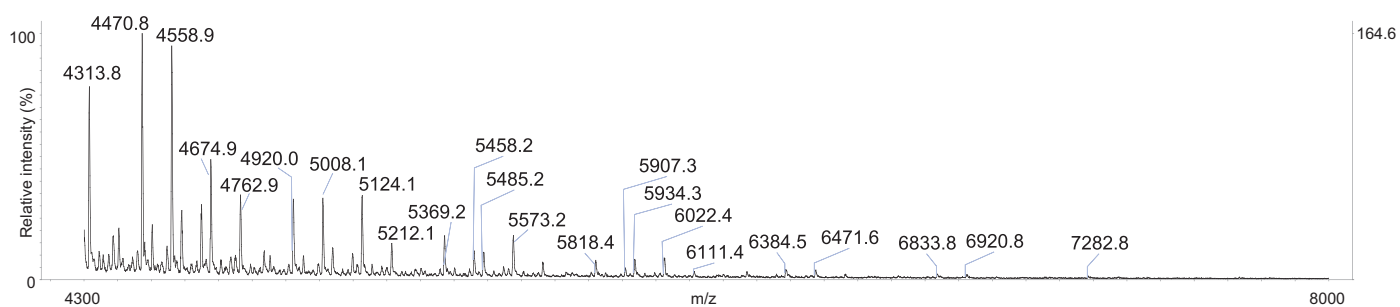
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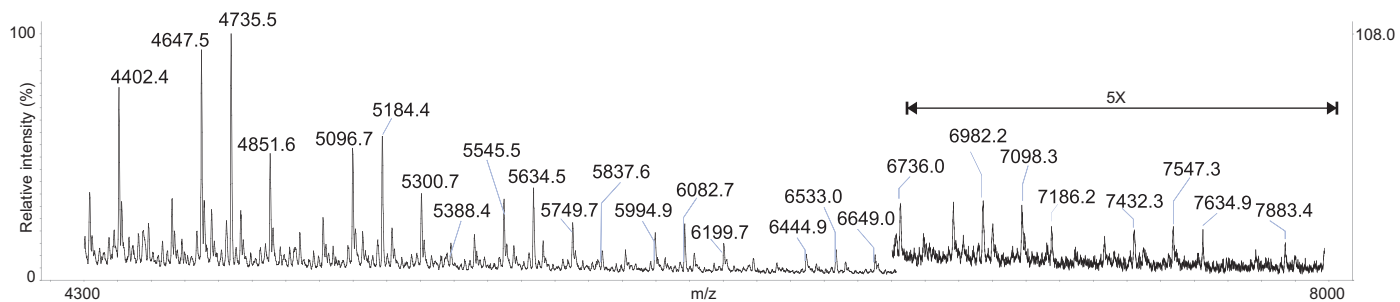
(1-3b) +GNE



(1-4b) +D176V

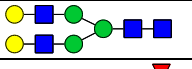
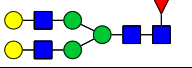
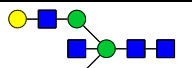
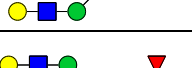
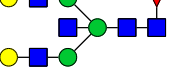


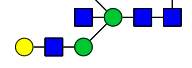
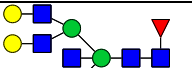

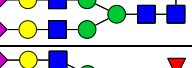
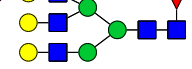
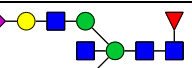
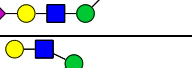


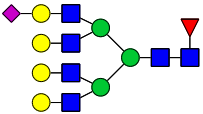
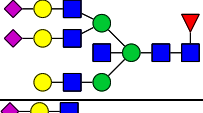
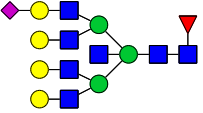
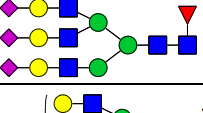
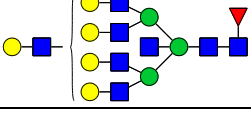
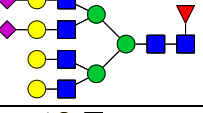
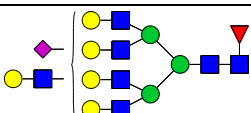
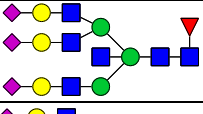
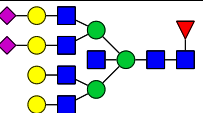
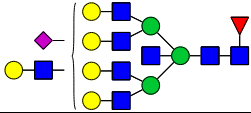
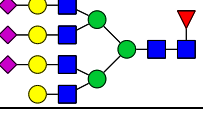
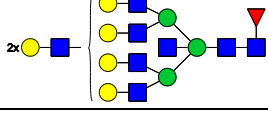
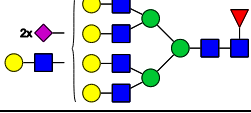
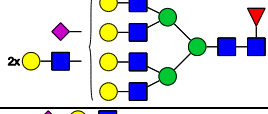
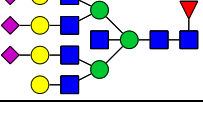
(1-5b) +Kinase

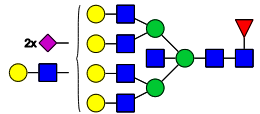
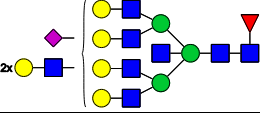
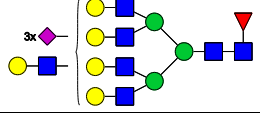
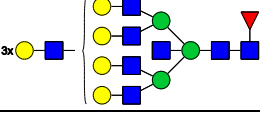
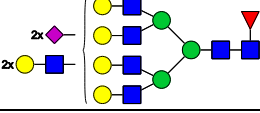
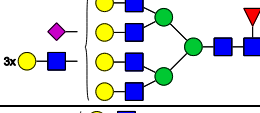
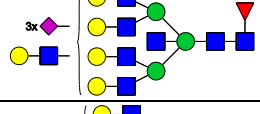
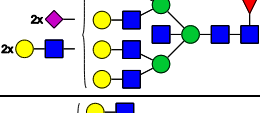
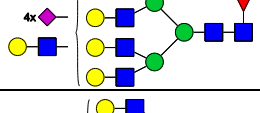
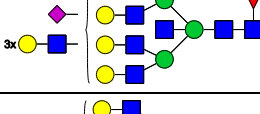
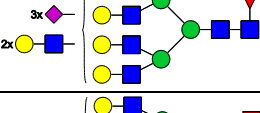
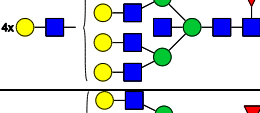
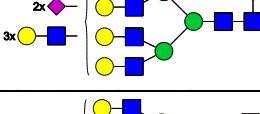
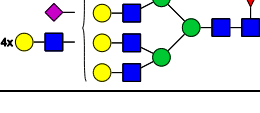


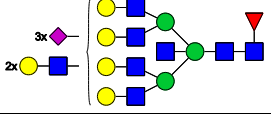
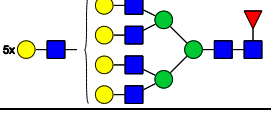
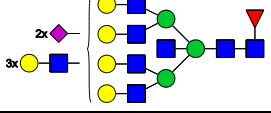
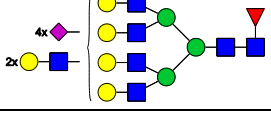
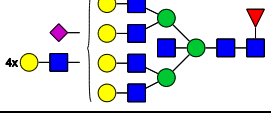
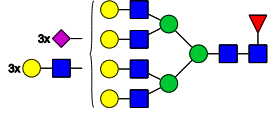
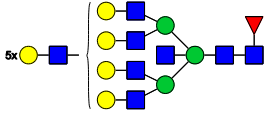
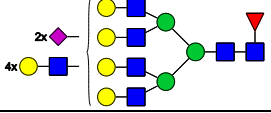
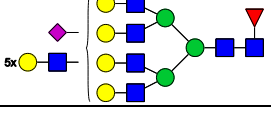
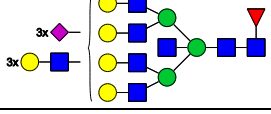
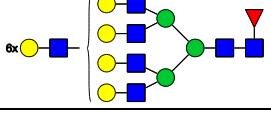
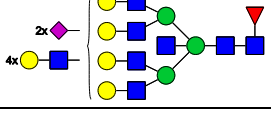
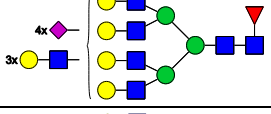
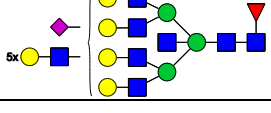
Supplementary Table 1

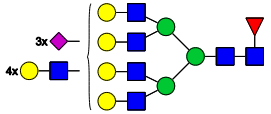
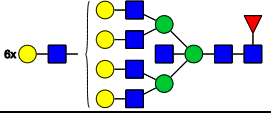
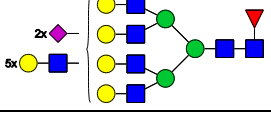
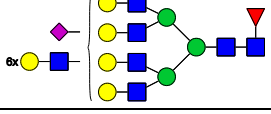
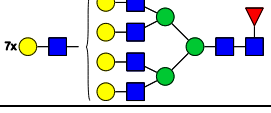
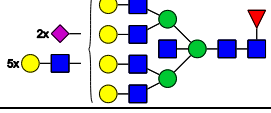
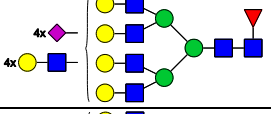
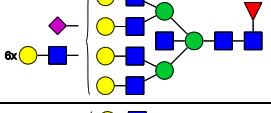
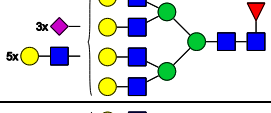
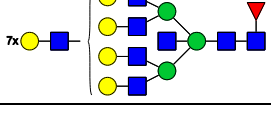
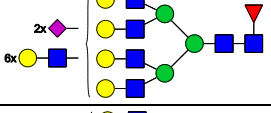
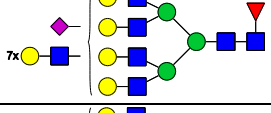
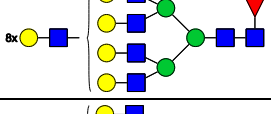
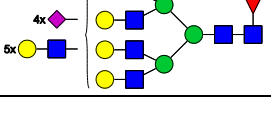
Tabulated MALDI-TOF MS data of permethylated N-glycans from K88, K20, +GNE, +D176V and +Kinase samples with proposed structures and relative intensities. The relative intensities are presented as percentage calculated by dividing the signal intensities at the indicated mass by the total intensities of all complex N-glycans within a sample. The intensities were extracted using the glyco-bioinformatics tool Glycoworkbench (Ceroni A., *et al.* 2008). The relative intensities values from these tables were used for generating the pie charts in Figure 6. Structural assignments are based on monosaccharide composition (obtained by MALDI-TOF MS), fragmentation analyses (MALDI-TOF/TOF MS/MS), and knowledge of glycan biosynthetic pathways. All molecular ions are $[M+Na]^+$. Sugar symbol key: galactose (yellow circle), mannose (green circle), N-acetylglucosamine (blue square), fucose (red triangle), and N-Acetylneuraminic acid (purple diamond).

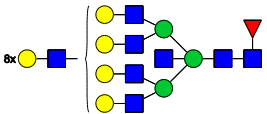
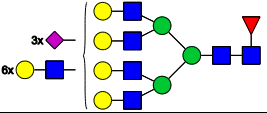
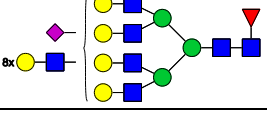
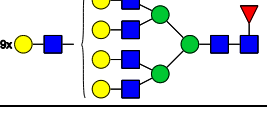
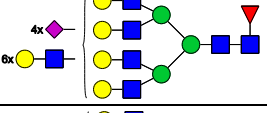
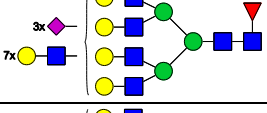
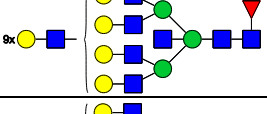
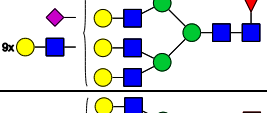
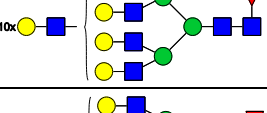
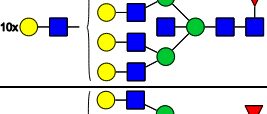
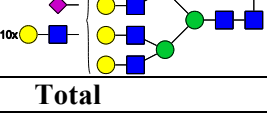
Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
2070		4.04	1.92	1.92	1.73	1.56
2244		9.70	3.65	2.93	3.25	2.83
2315		1.59	1.98	1.15	0.84	1.83
2489		5.01	9.29	3.79	3.51	8.17
2693		1.49	1.71	0.90	0.82	1.60
2850		12.09	2.46	9.96	9.99	6.54
2938		4.85	8.81	3.58	3.37	8.13
2966		1.11	0.00	2.07	2.73	0.71
3054		3.99	1.13	4.51	4.30	3.03
3211		4.80	0.00	6.20	9.12	1.53
3213		0.00	1.82	0.00	0.00	2.12
3299		9.59	1.76	7.47	7.33	4.82
3387		12.36	49.75	14.17	12.97	27.48
3415		1.14	0.00	2.02	2.49	0.00

Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
3504		4.12	2.01	6.80	5.21	5.69
3660		1.56	0.00	2.53	2.69	0.00
3749		11.36	2.62	12.03	11.13	7.59
3777		2.07	0.00	0.87	1.29	0.00
3837		0.00	3.54	0.00	0.00	3.77
3864		1.22	0.00	3.15	3.38	0.00
3953		0.00	0.43	0.00	0.00	1.14
4022		0.29	0.00	0.62	0.93	0.00
4110		2.53	0.00	4.80	5.22	0.00
4198		1.25	0.60	1.42	1.20	1.43
4226		0.41	0.00	0.80	1.01	0.00
4286		0.00	1.19	0.00	0.00	1.42
4314		0.34	0.00	0.71	0.70	0.00
4402		0.00	0.31	0.00	0.00	0.67
4471		0.30	0.00	0.70	0.72	0.00

Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
4559		0.56	0.00	0.87	0.80	0.00
4647		0.29	0.29	0.35	0.32	0.74
4675		0.23	0.00	0.39	0.37	0.00
4735		0.00	0.68	0.00	0.00	0.73
4763		0.14	0.00	0.36	0.28	0.00
4851		0.00	0.20	0.00	0.00	0.43
4920		0.14	0.00	0.24	0.26	0.00
5008		0.17	0.00	0.30	0.22	0.00
5036		0.06	0.00	0.15	0.10	0.00
5096		0.09	0.21	0.15	0.12	0.41
5124		0.14	0.00	0.26	0.24	0.37
5185		0.00	0.97	0.00	0.00	1.09
5212		0.08	0.00	0.16	0.11	0.40
5300		0.00	0.19	0.00	0.00	0.27

Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
5370		0.09	0.00	0.16	0.13	0.00
5389		0.00	0.14	0.00	0.00	0.18
5458		0.20	0.41	0.23	0.18	0.35
5486		0.08	0.00	0.09	0.09	0.00
5546		0.05	0.18	0.13	0.07	0.24
5574		0.14	0.00	0.14	0.12	0.00
5634		0.00	0.21	0.00	0.00	0.44
5662		0.07	0.00	0.09	0.06	0.00
5750		0.00	0.12	0.00	0.00	0.19
5819		0.05	0.00	0.09	0.06	0.00
5838		0.00	0.10	0.00	0.00	0.13
5907		0.08	0.00	0.10	0.07	0.23
5935		0.07	0.00	0.11	0.06	0.00
5995		0.00	0.16	0.07	0.06	0.15

Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
6023		0.08	0.00	0.08	0.05	0.00
6083		0.00	0.16	0.00	0.00	0.14
6111		0.00	0.00	0.08	0.05	0.00
6199		0.00	0.09	0.00	0.00	0.19
6287		0.00	0.13	0.00	0.00	0.10
6356		0.00	0.00	0.05	0.05	0.00
6384		0.00	0.00	0.06	0.06	0.00
6444		0.00	0.08	0.00	0.00	0.15
6472		0.00	0.00	0.07	0.04	0.00
6532		0.00	0.08	0.00	0.00	0.14
6560		0.00	0.00	0.04	0.04	0.00
6648		0.00	0.09	0.00	0.00	0.13
6736		0.00	0.11	0.00	0.00	0.08
6833		0.00	0.00	0.04	0.02	0.00

Mass (m/z)	Cartoon depiction of proposed structure	Relative intensities (%)				
		K88	K20	+GNE	+D176V	+Kinase
6981		0.00	0.08	0.00	0.00	0.09
6921		0.00	0.00	0.04	0.03	0.00
7098		0.00	0.07	0.00	0.00	0.13
7186		0.00	0.08	0.00	0.00	0.06
7283		0.00	0.00	0.02	0.02	0.00
7371		0.00	0.00	0.03	0.00	0.00
7431		0.00	0.05	0.00	0.00	0.09
7547		0.00	0.05	0.00	0.00	0.07
7635		0.00	0.05	0.00	0.00	0.09
7880		0.00	0.04	0.00	0.00	0.07
7996		0.00	0.00	0.00	0.00	0.05
Total		100.00	100.00	100.00	100.00	100.00