Supplementary Information

Nanoparticles and Photochemistry for Native-like Transmembrane Protein Footprinting

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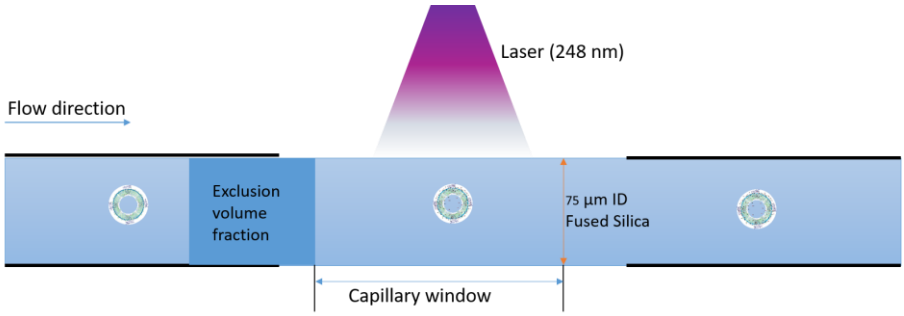

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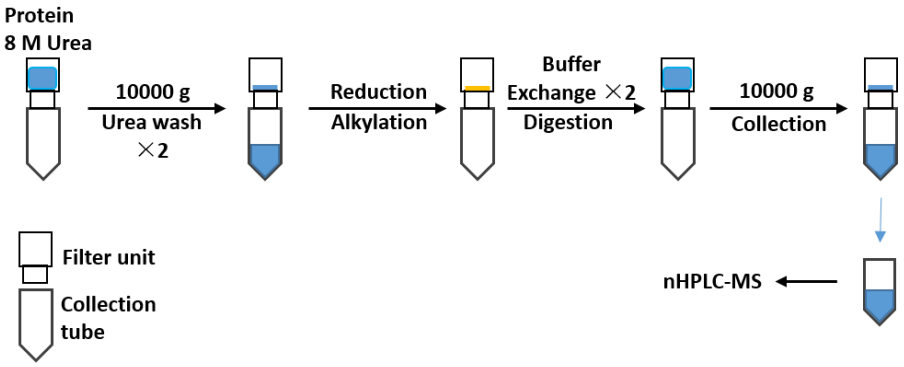

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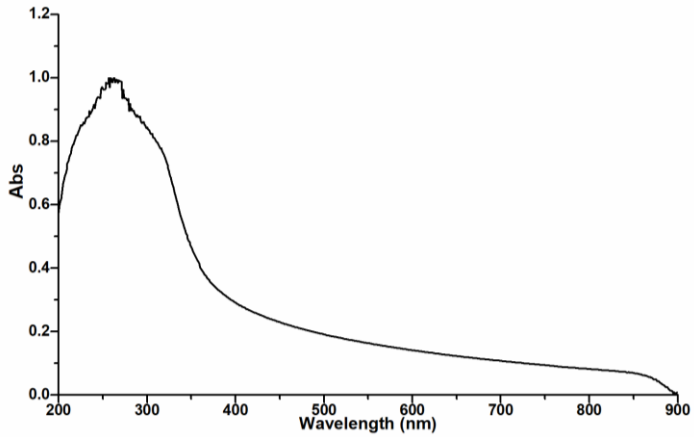

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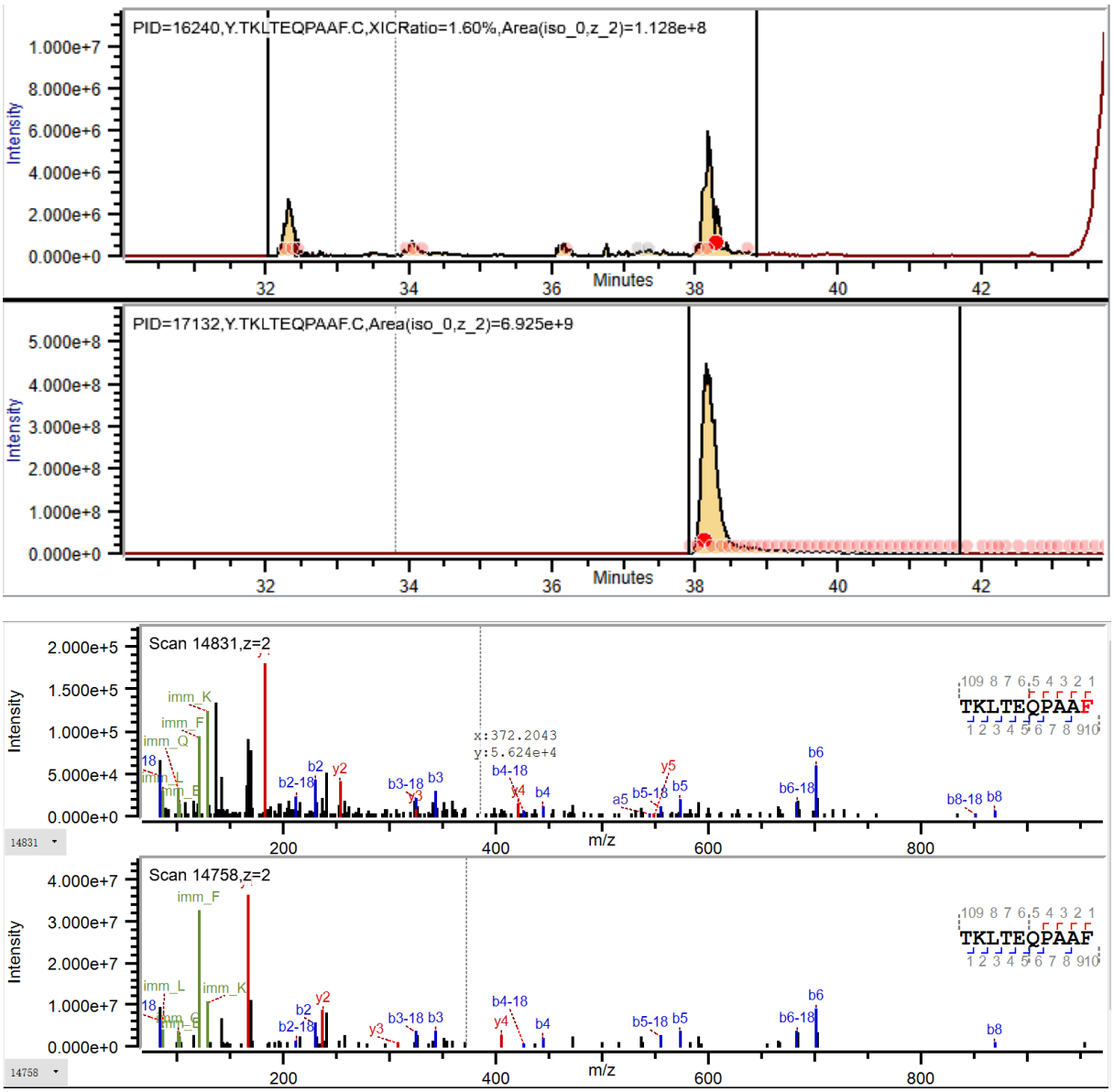

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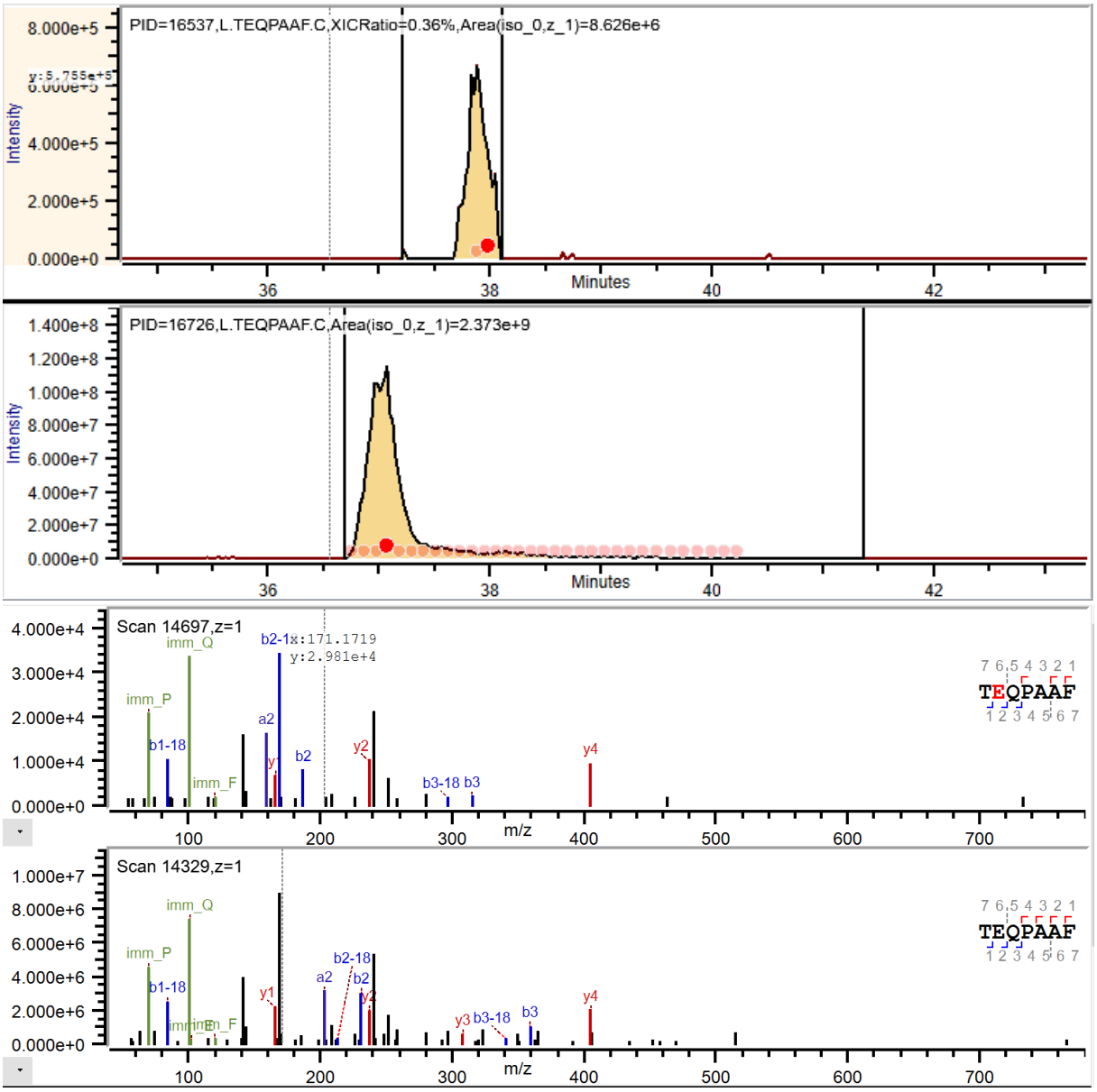

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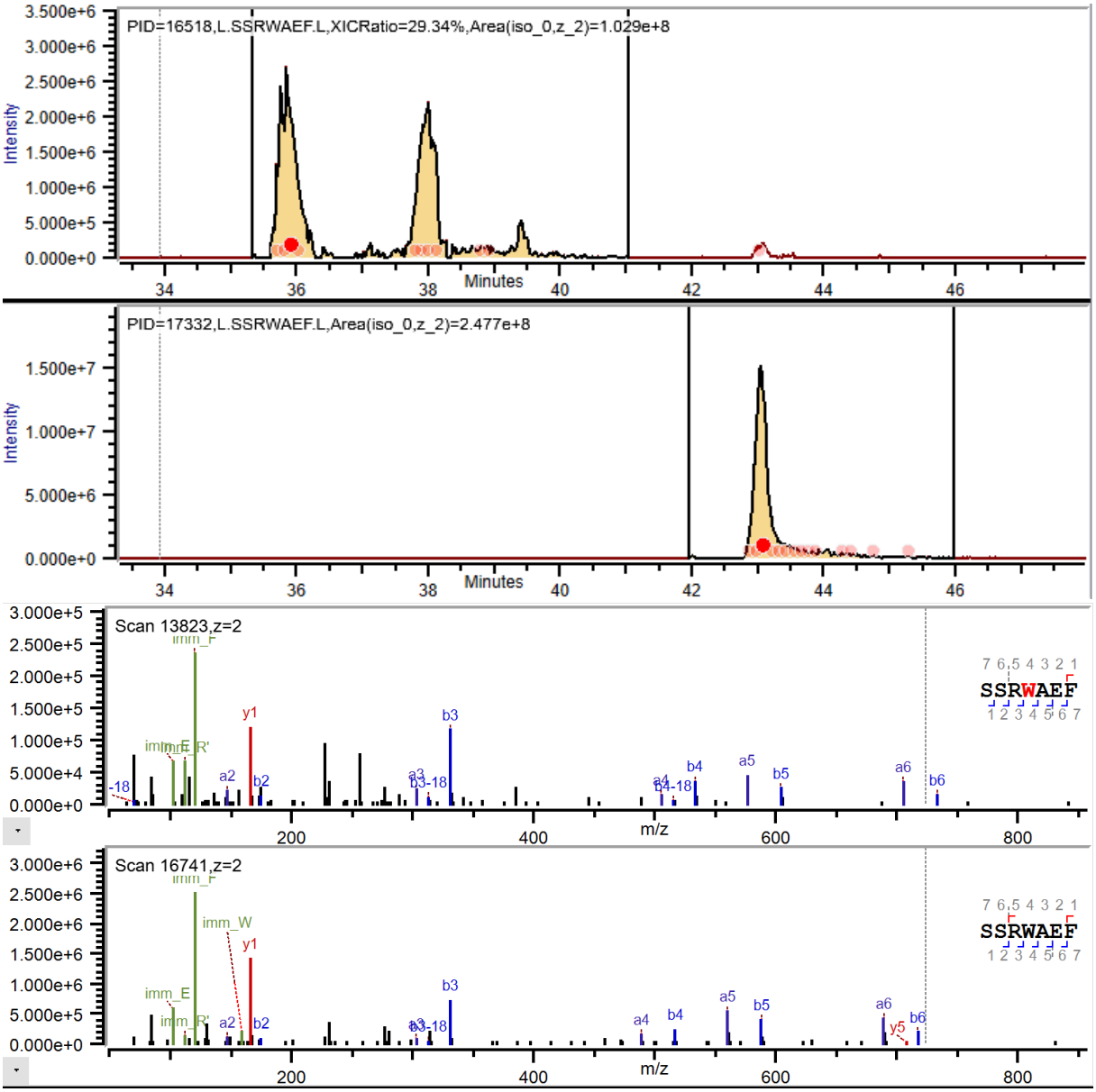

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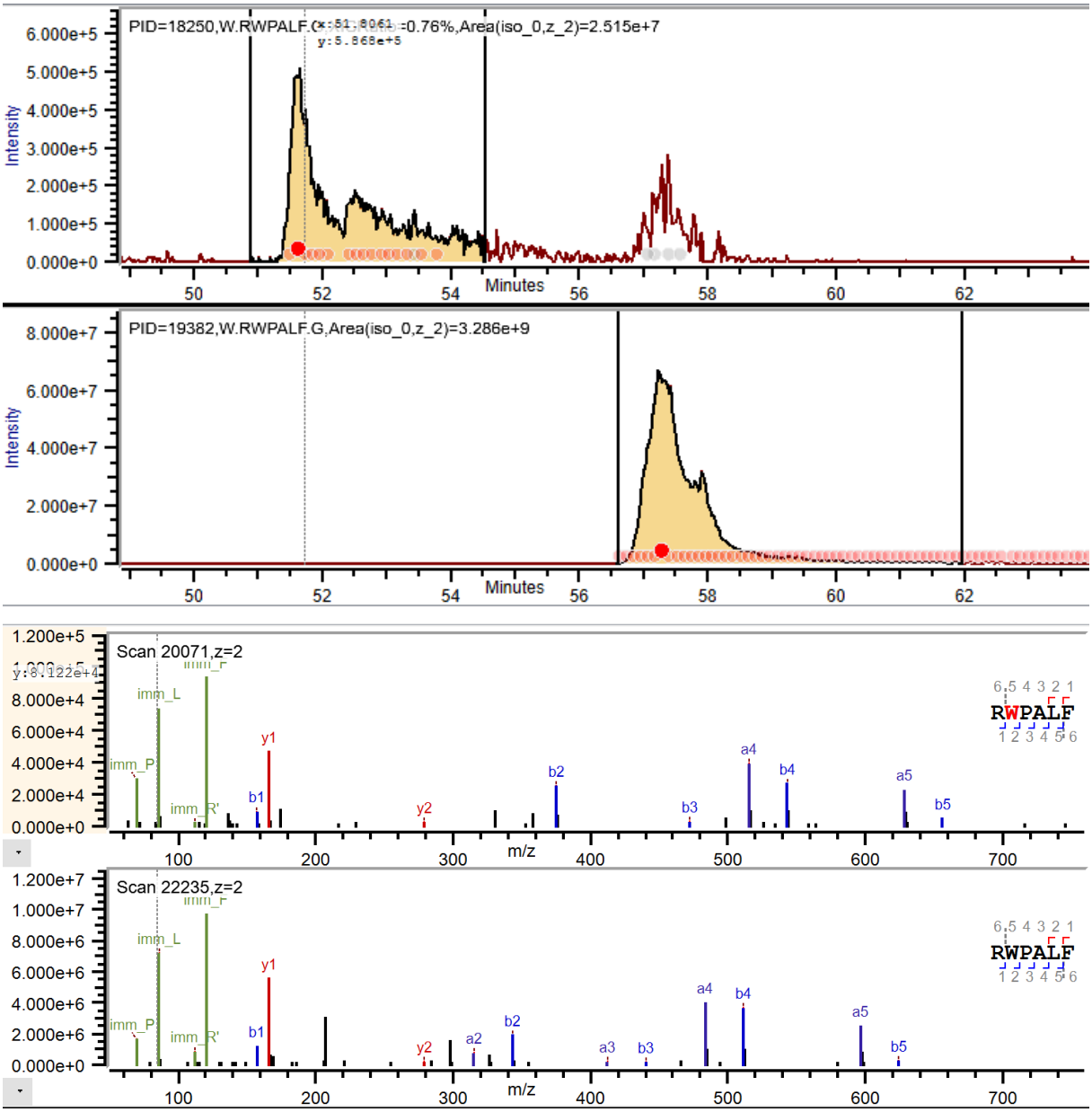

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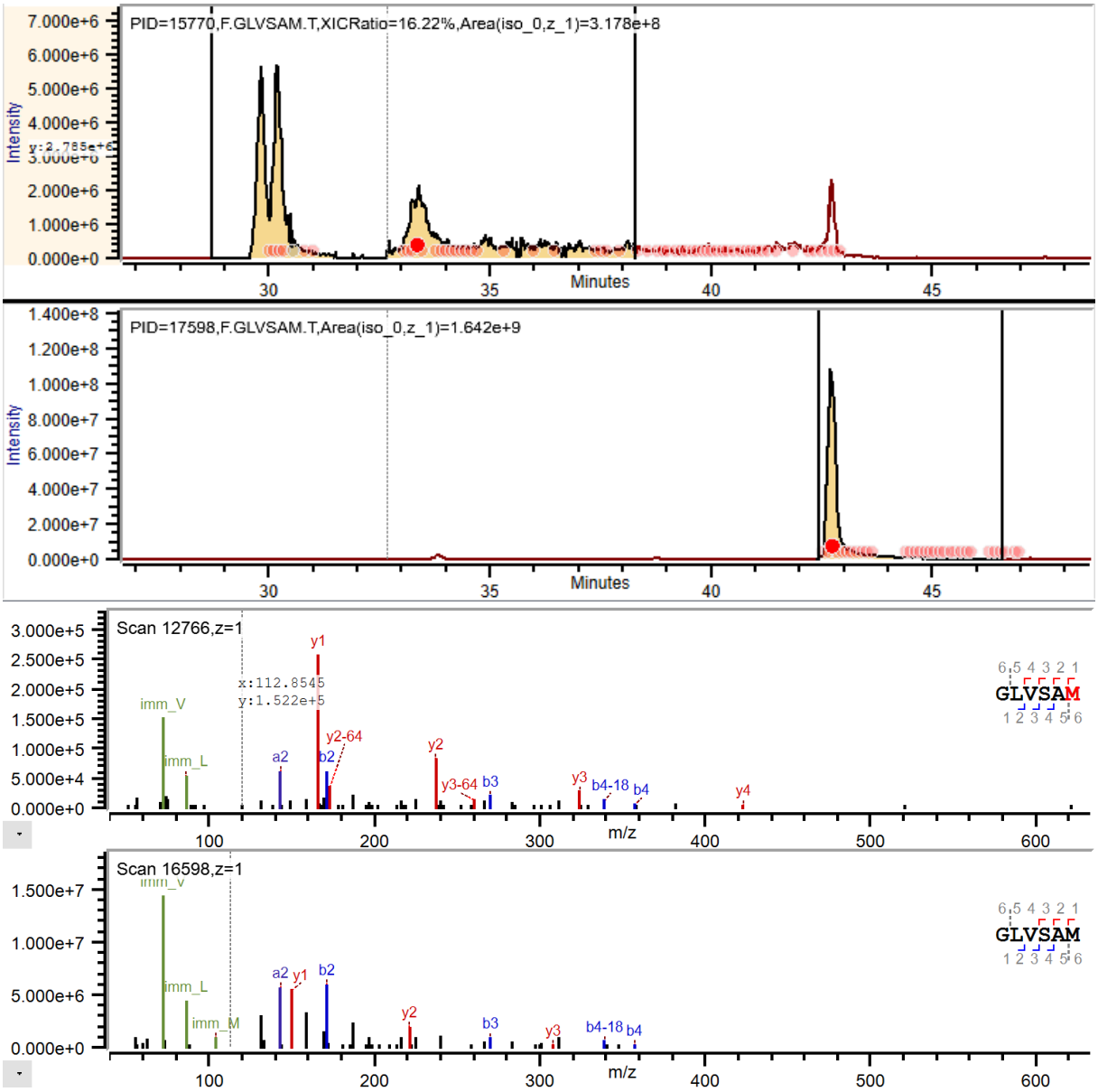

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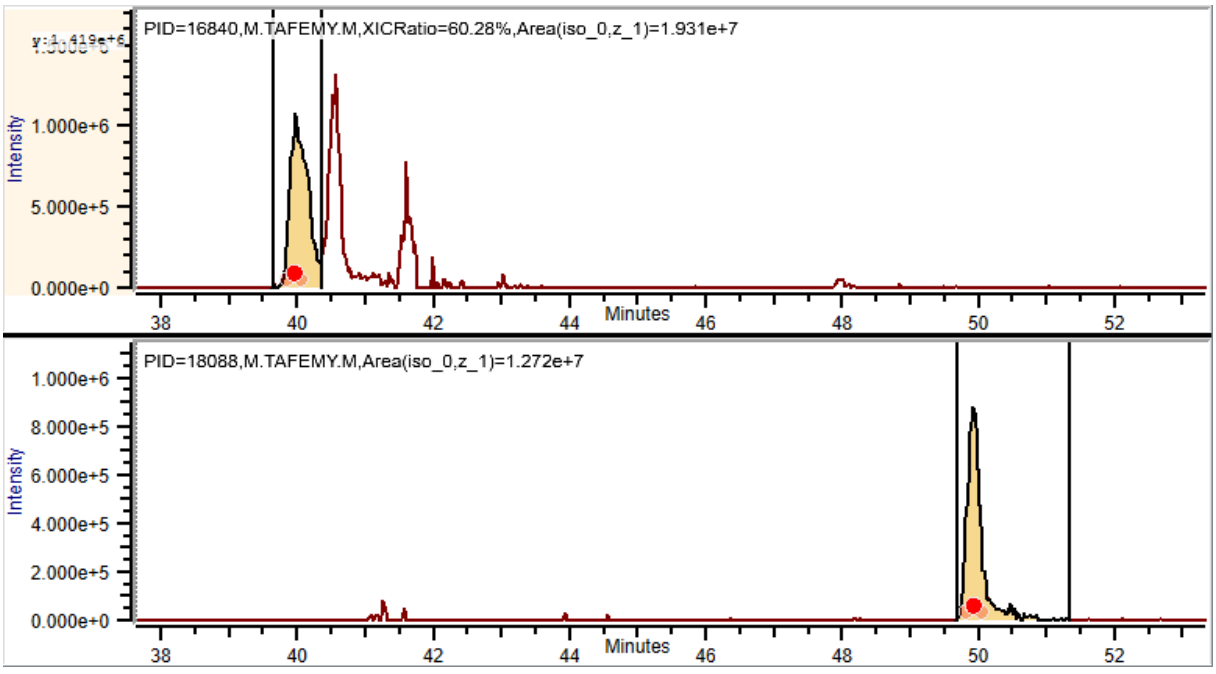

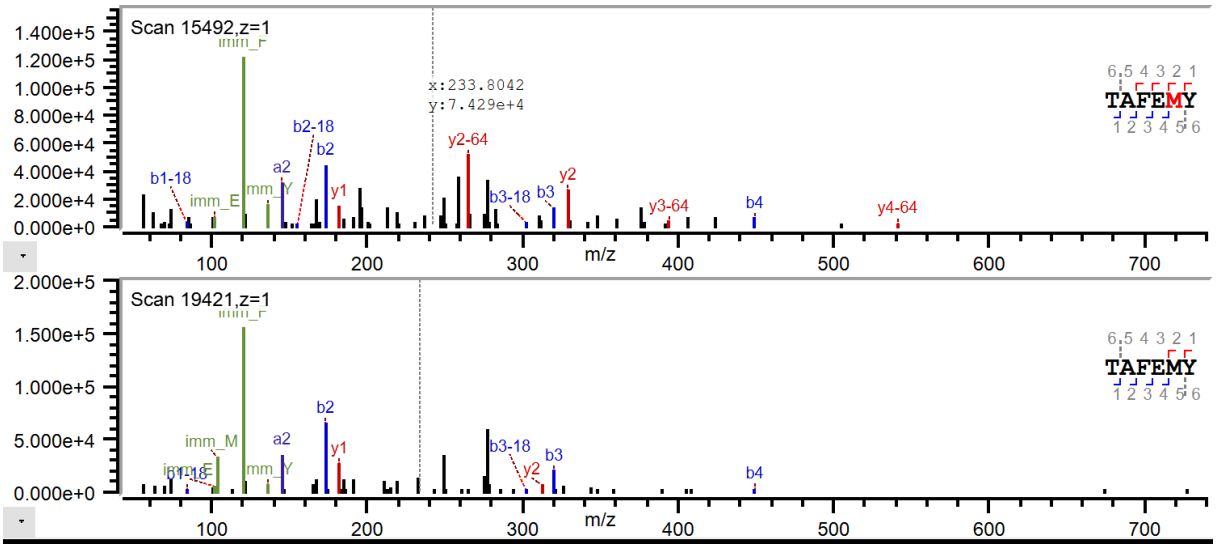

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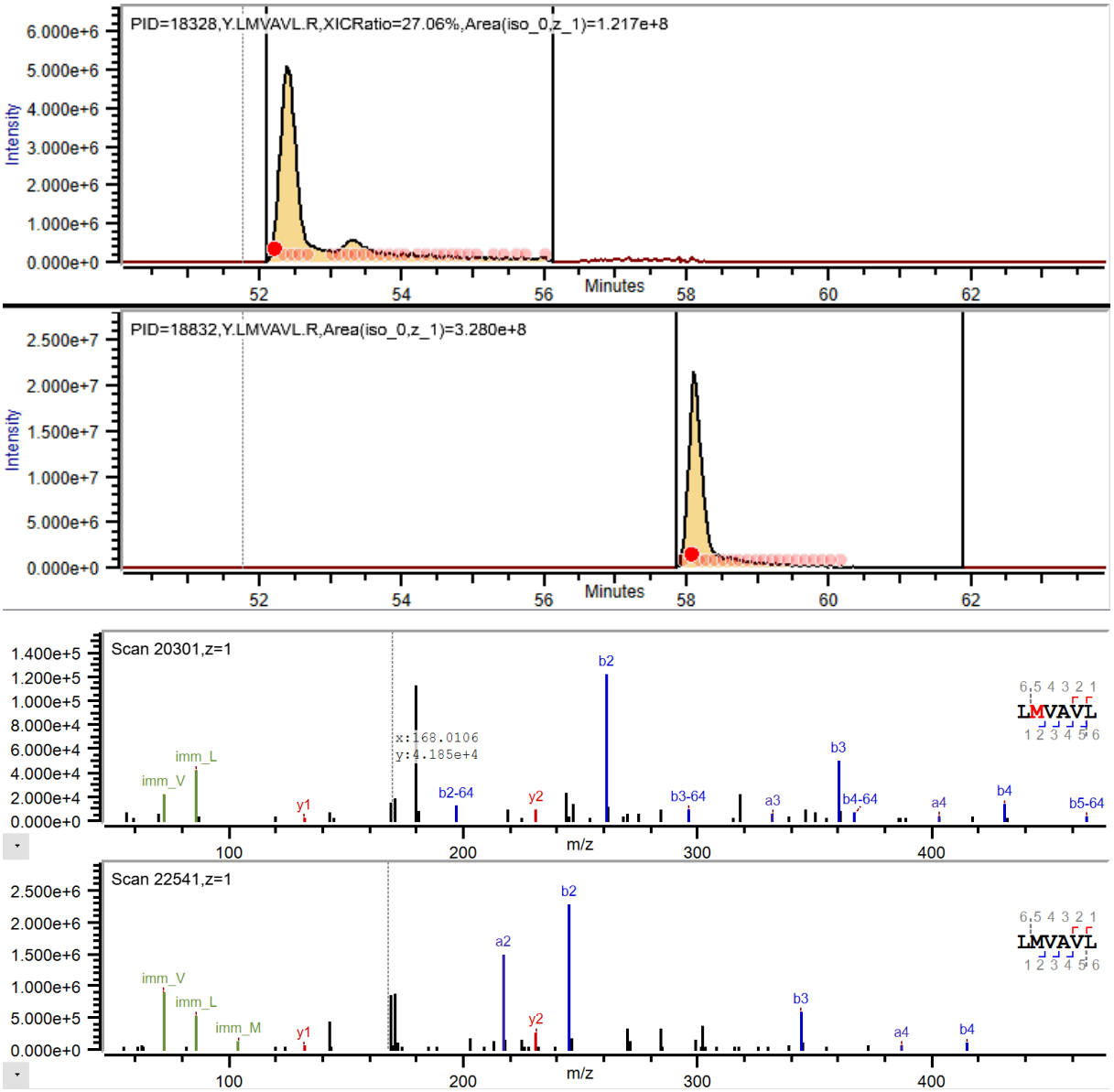

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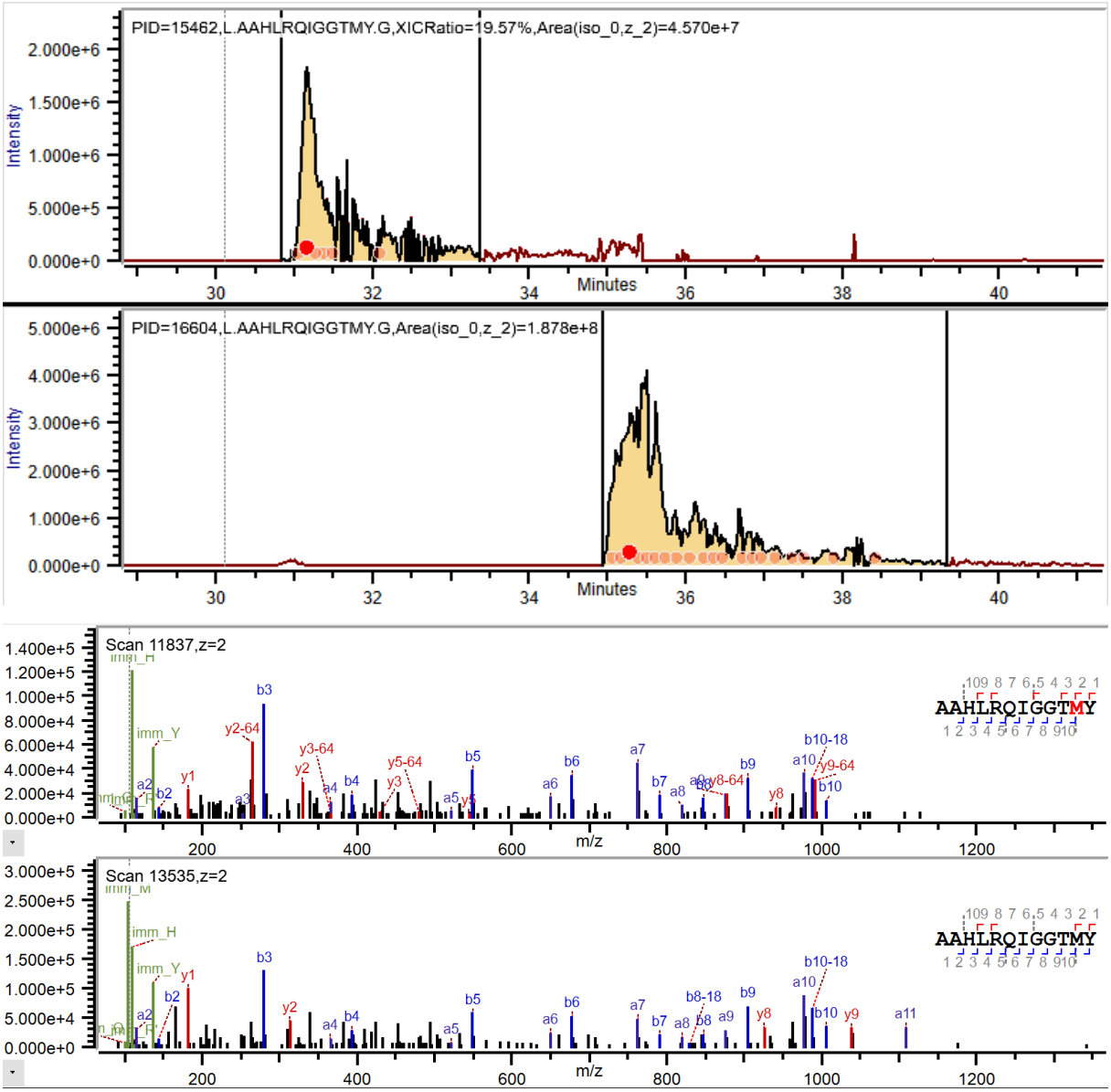

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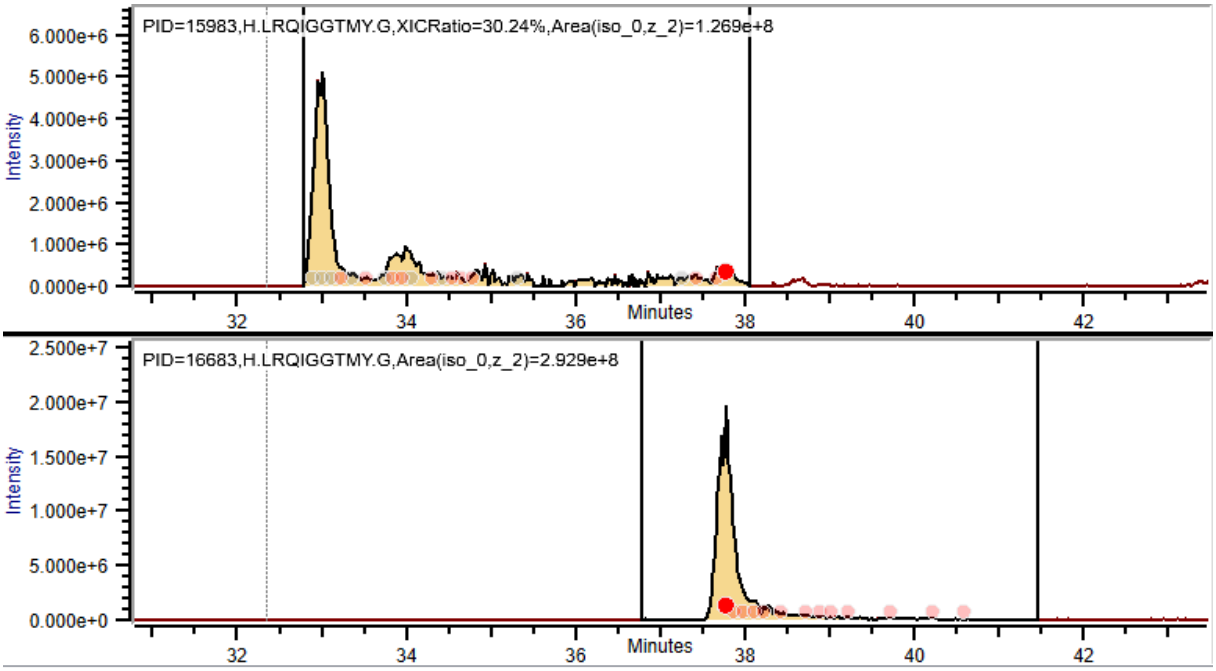

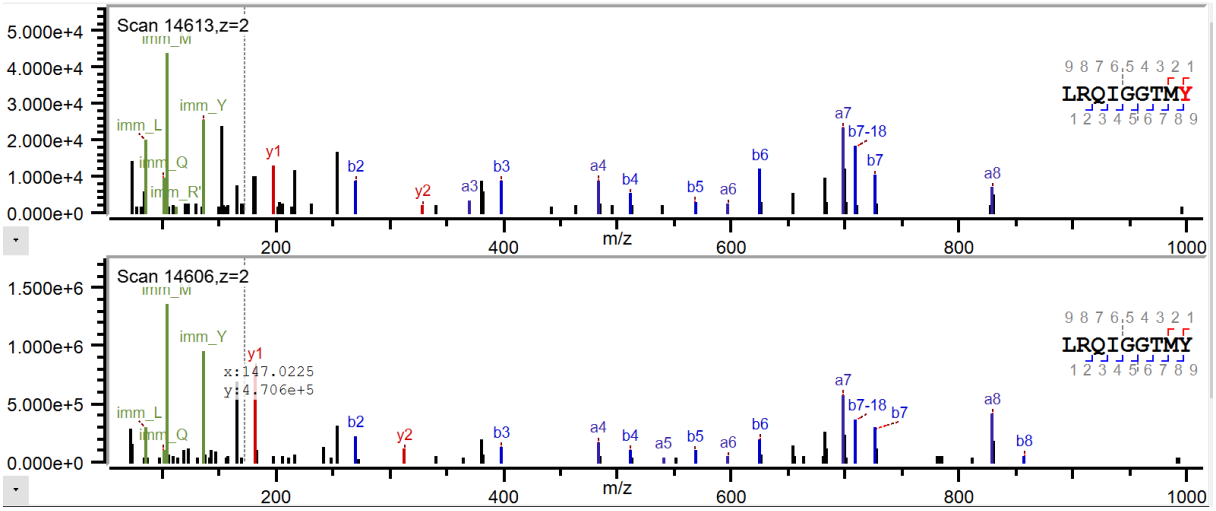

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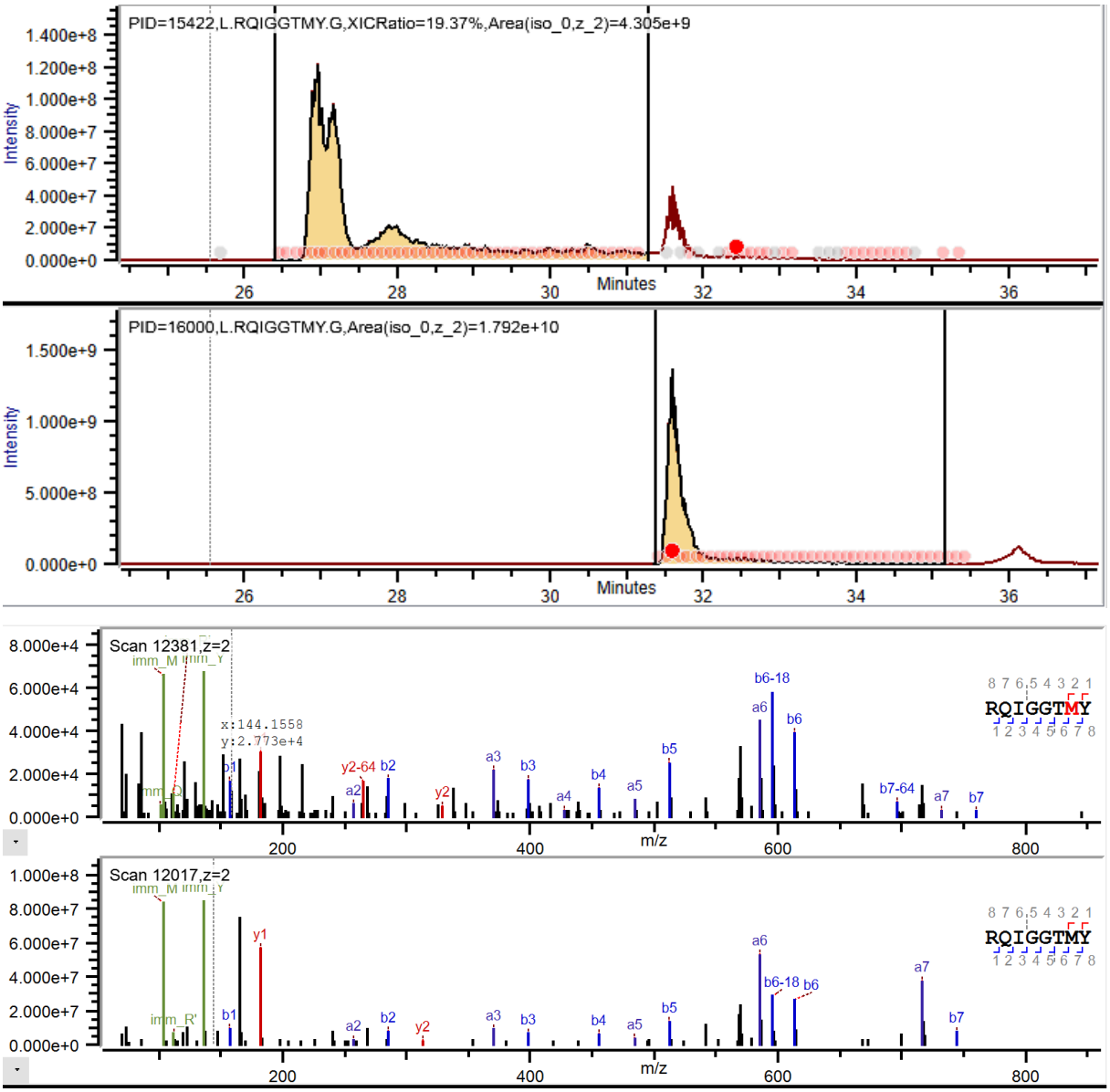

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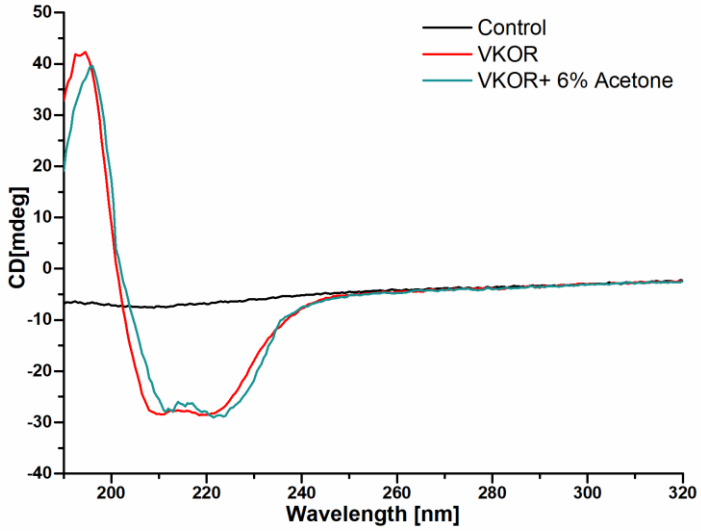

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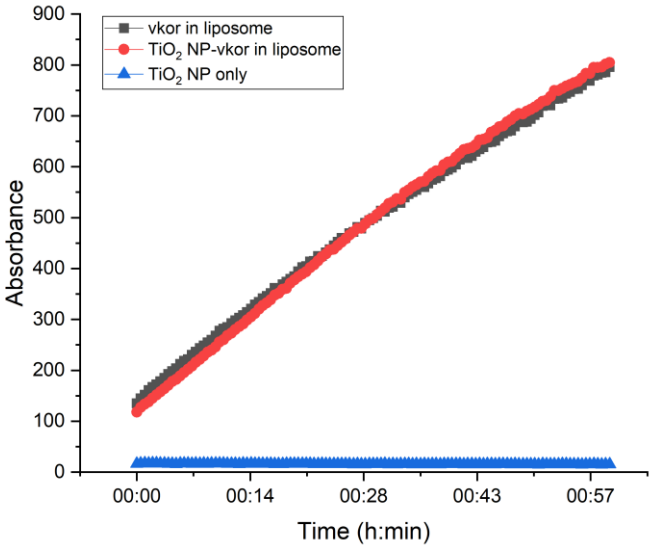

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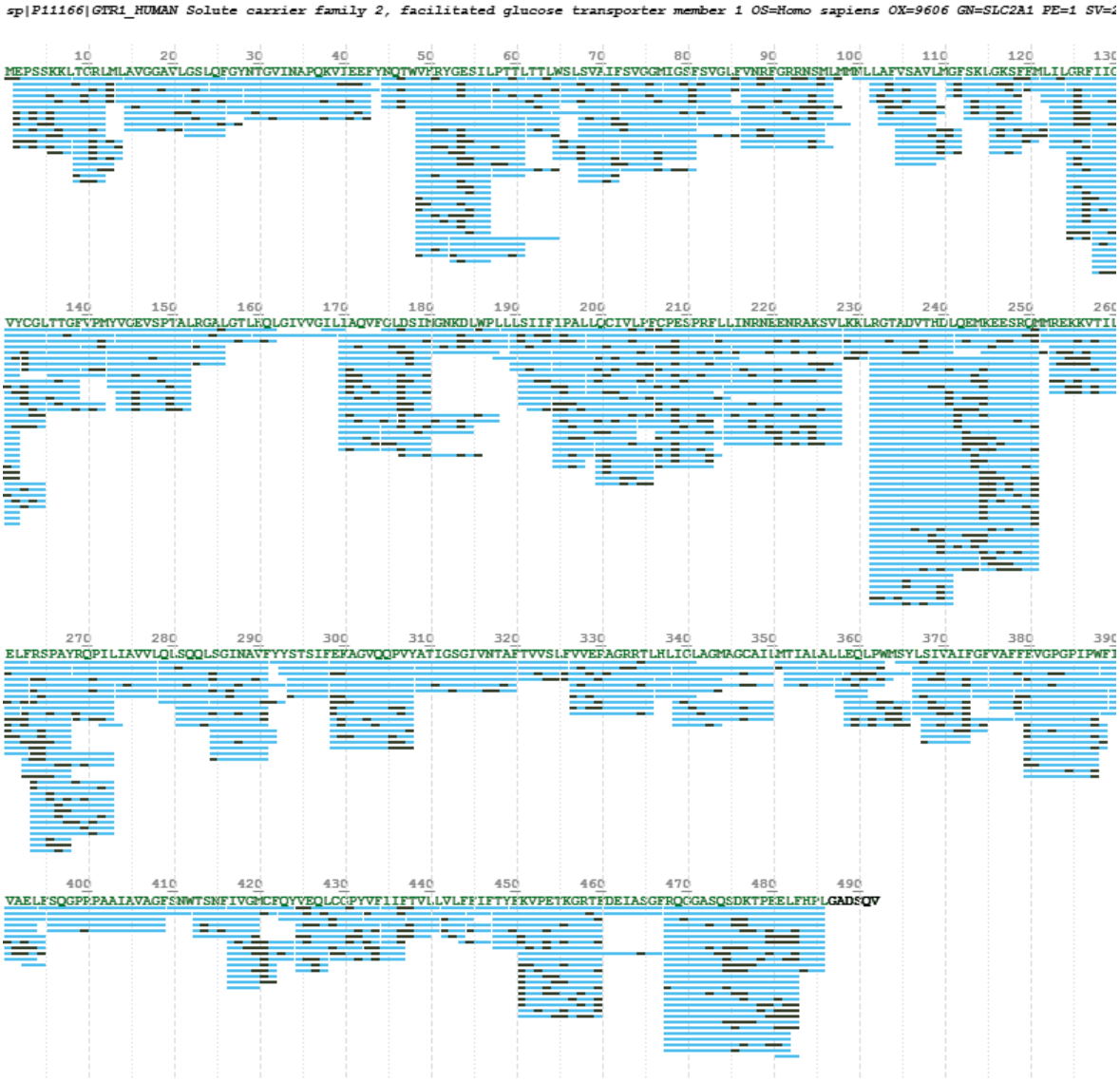
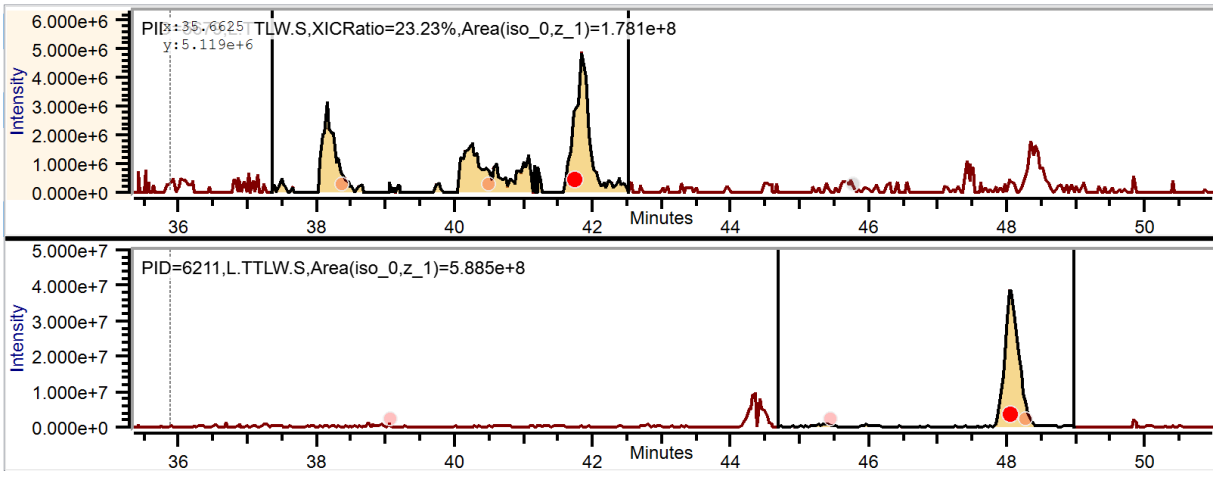
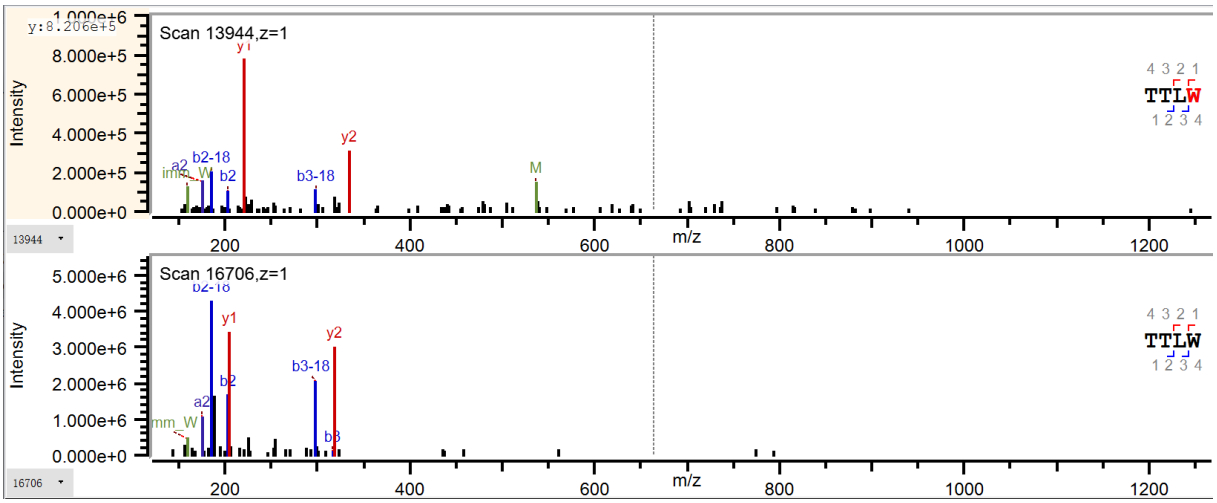


Supplementary Figure 17. MS sequence coverage example of hGLUT1 in bottom-up proteomics obtained by Biologic™ software.





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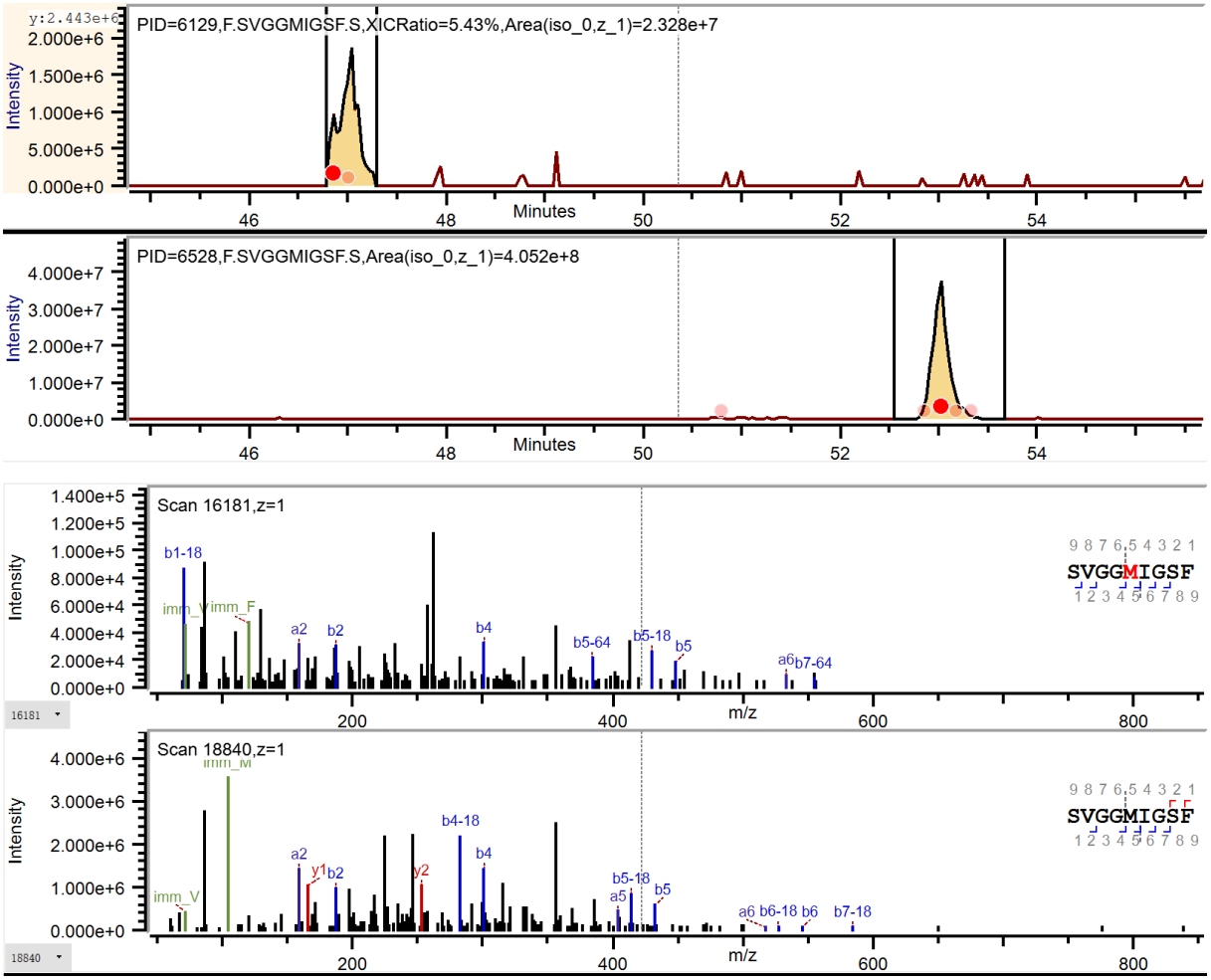

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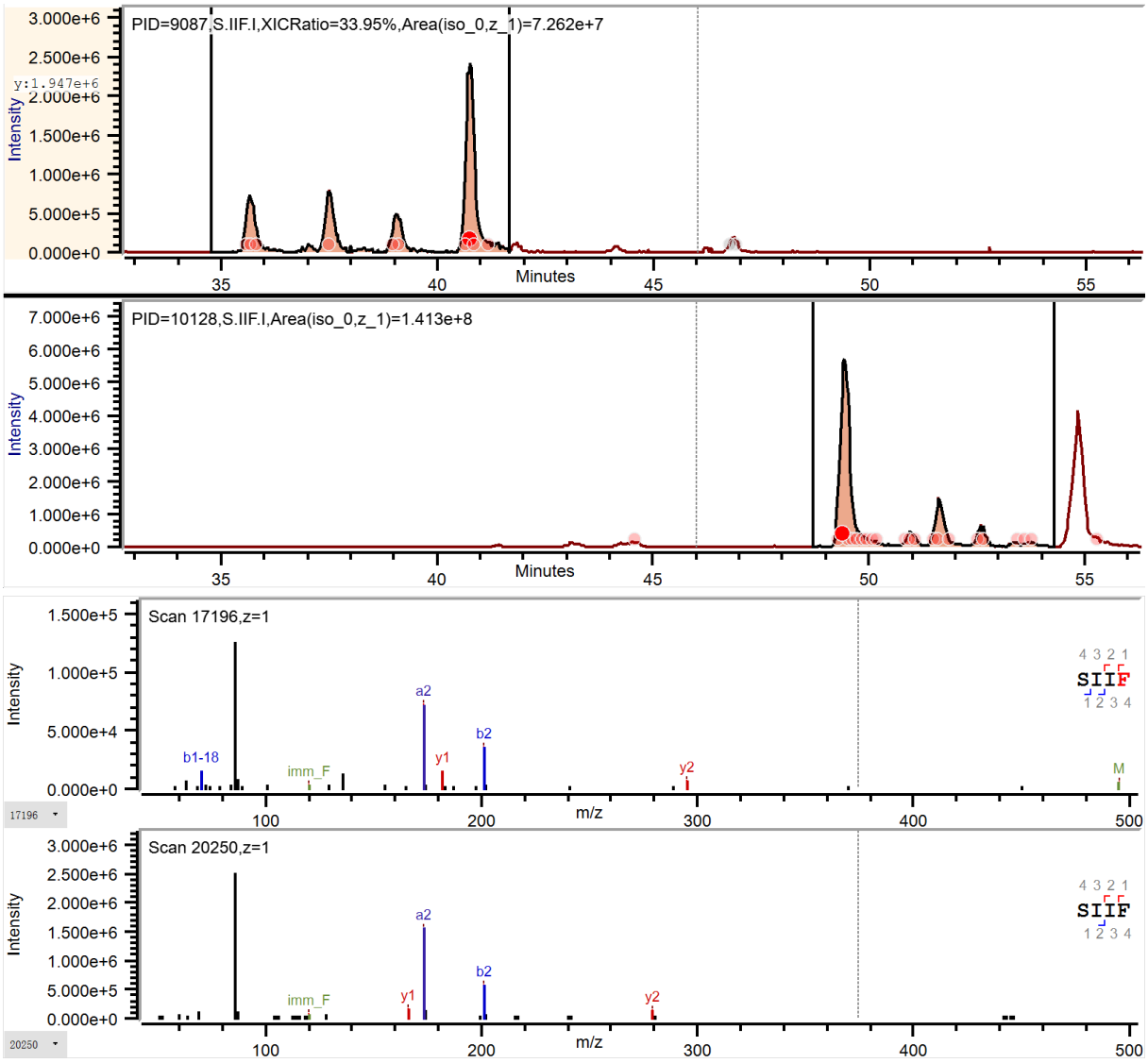

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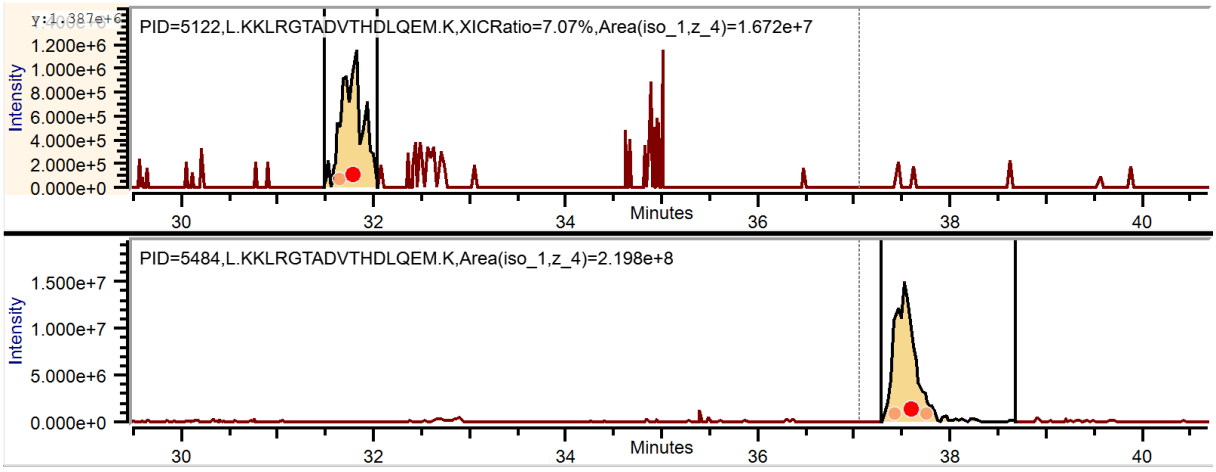

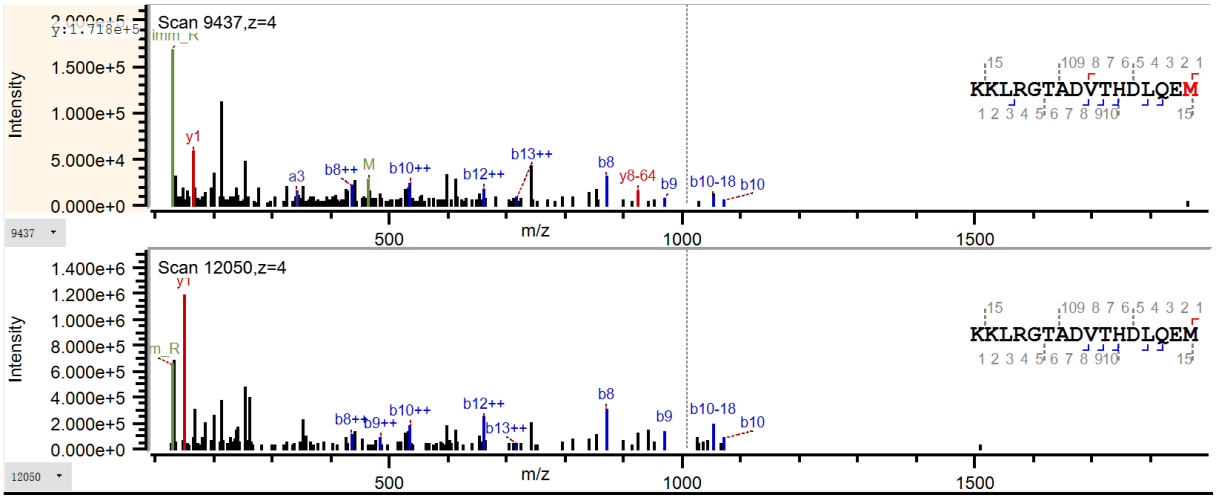

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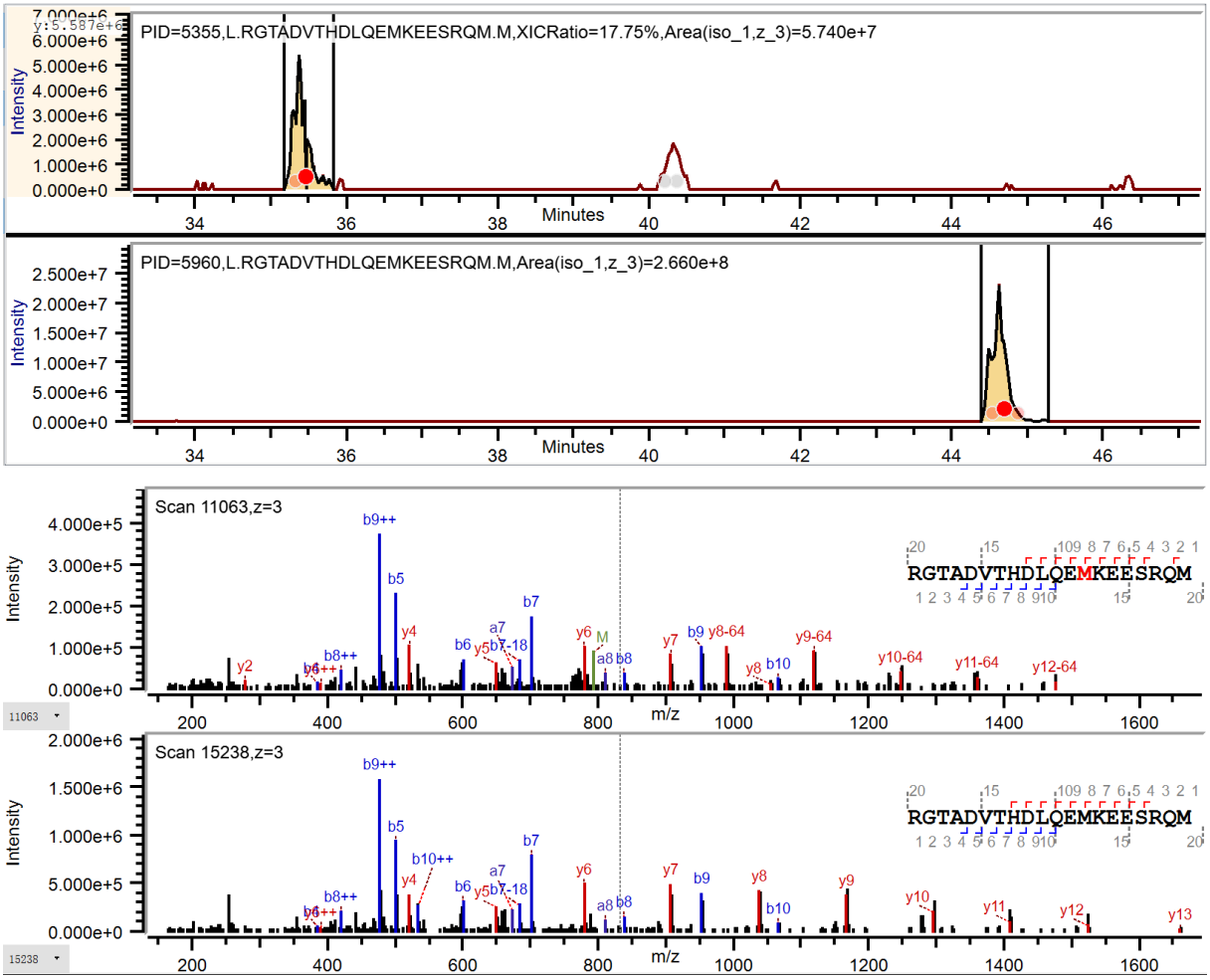

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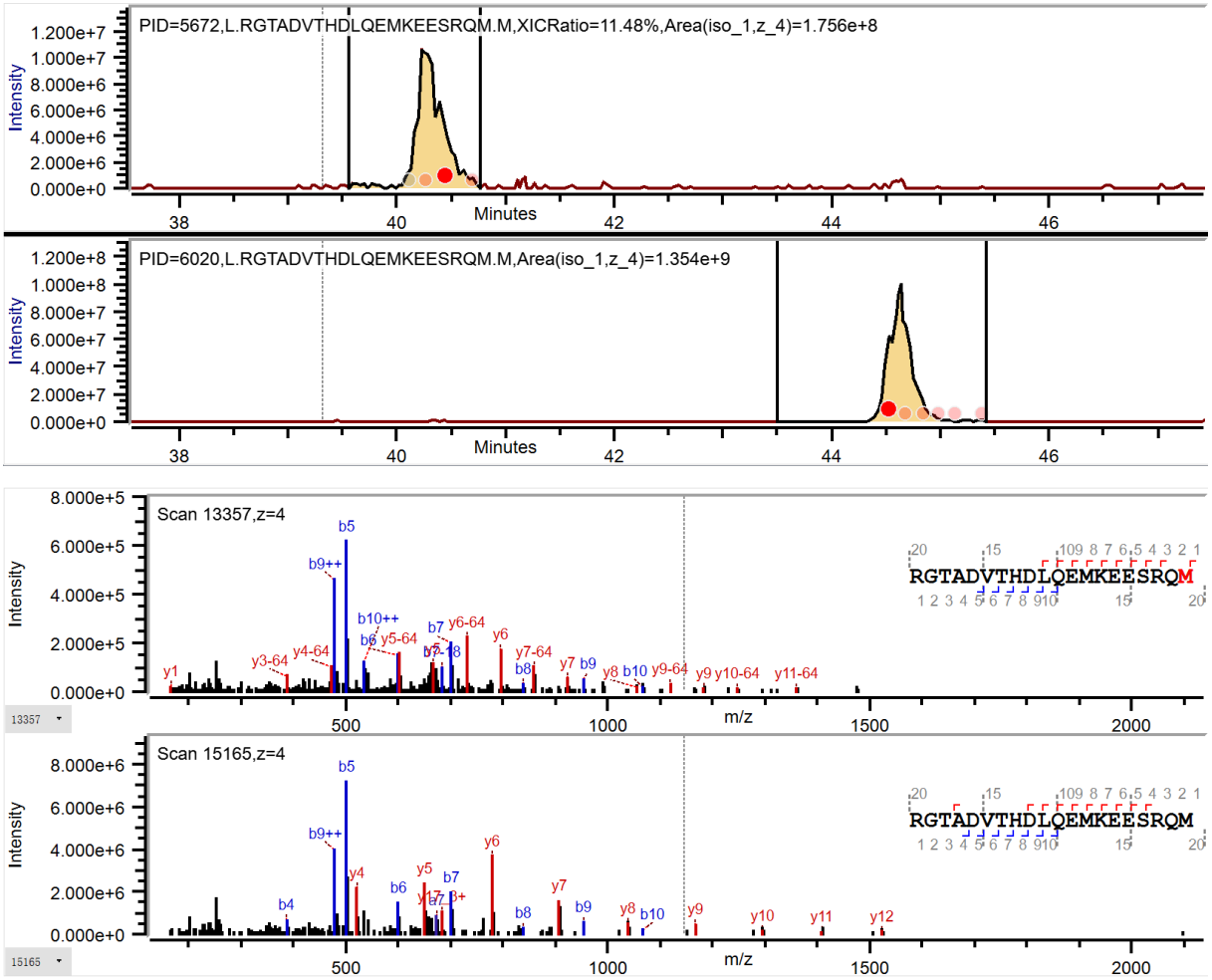

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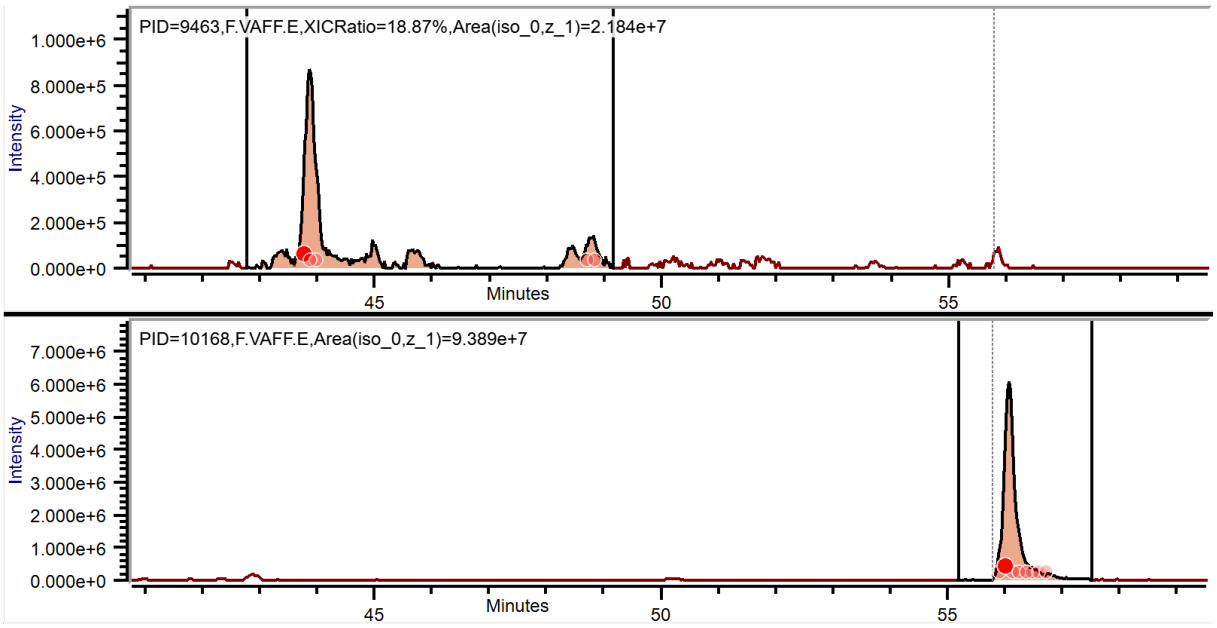

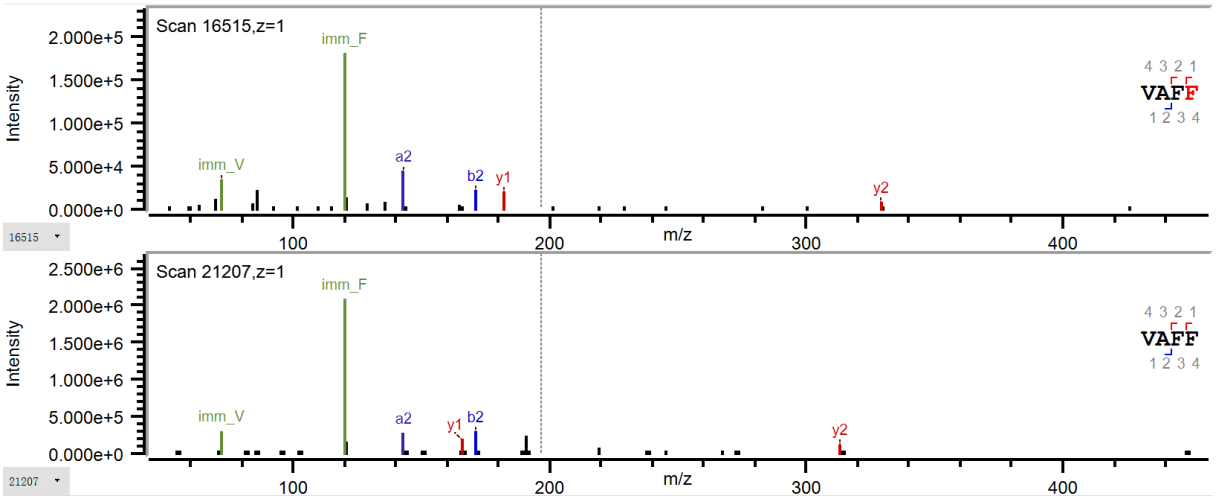

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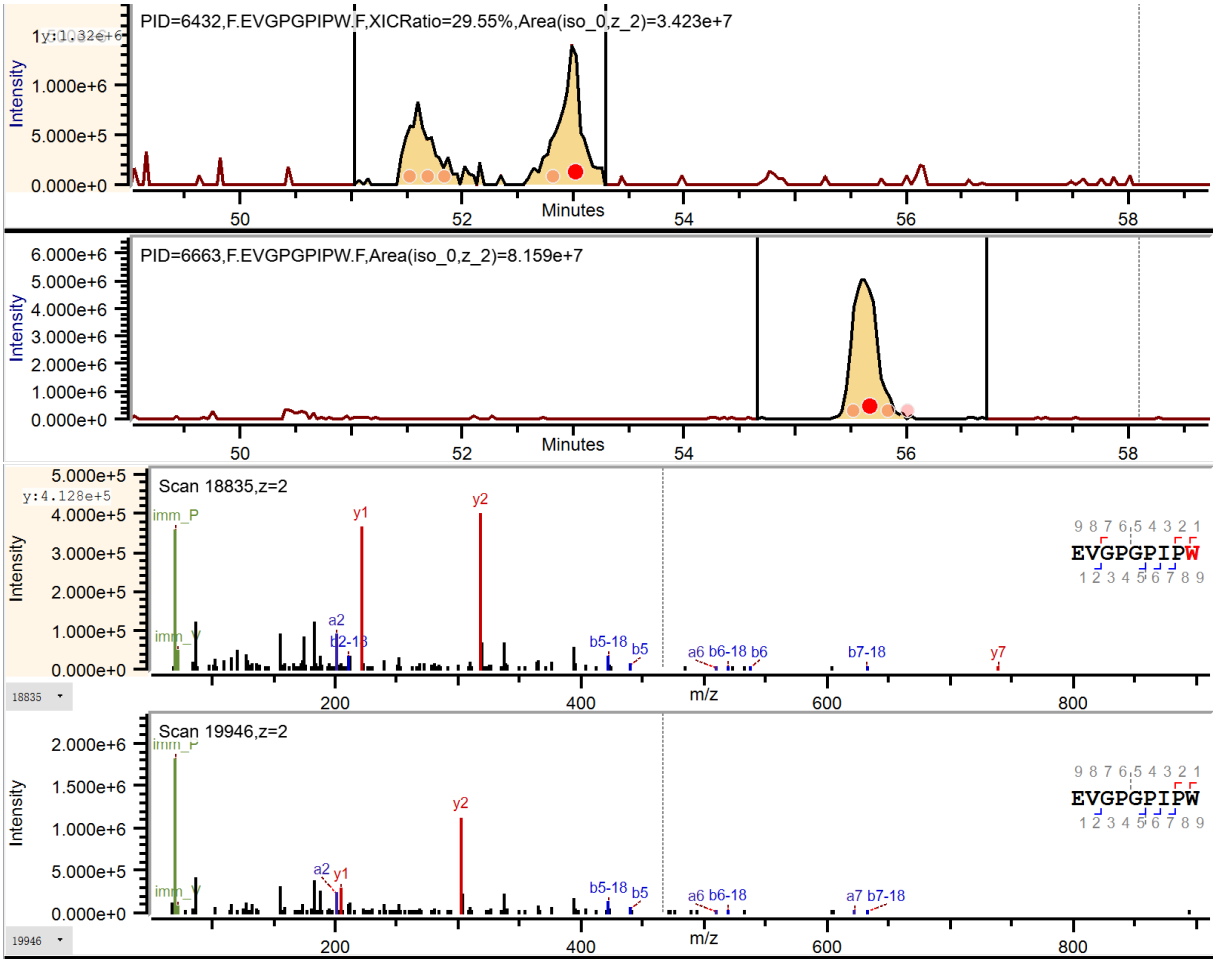

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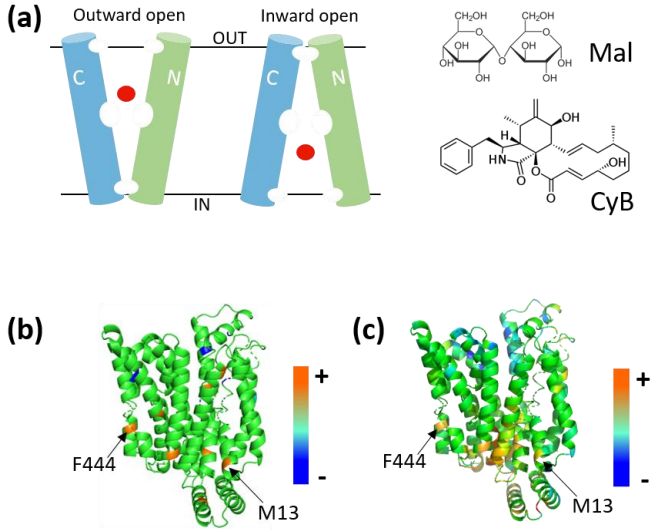

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2. Supplementary Tables

Supplementary Table 1. Optimization of several conditions for NanoPOMP. All volumes are in µL.

	0%	2%	4%	5%	6%	8%	10%	13%	15%
VKOR-liposome	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
TiO_2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Tris buffer	42.5	41.5	40.5	40	39.5	38.5	37.5	36	35
Acetone	0	1	2	2.5	3	4	5	6.5	7.5

Supplementary Table 2. NanoPOMP experiments of hGLUT1 in liposome. All volumes are in µL.

	A	B	C	D	E
GLUT1-liposome	5.0	5.0	5.0	5.0	5.0
TiO_2	5.0	5.0	5.0	5.0	5.0
Acetone	0	3	3	3	3
Tris buffer	40	37	32	32	32
Substrates	--	--	5 (glucose)	5 (Mal)	5 (CyB)

Supplementary Table 3. TiO_2-FPOP of hGLUT1 at the peptide level.

Peptide Number	*m/z* unmod	*m/z* modified	EIC unmod	EIC modified	Fraction modified	Modified residue
62-65	520.277	536.271	1.581E8	8.196E7	3.414	W
73-81	854.408	870.403	1.758E8	1.859E7	9.559	M
140-152	681.852	689.850	2.132E7	9.798E6	31.49	M
140-143	509.243	525.238	6.835E7	1.319E8	65.86	M
144-150	344.679	322.689	4.674E8	1.248E7	2.601	E
191-194	479.286	495.281	6.595E7	9.750E6	12.88	F
232-244	491.565	496.895	8.890E7	5.553E7	38.45	M
232-251	788.037	793.368	1.055E7	1.672E7	16.31	M
299-308	559.796	537.801	1.124E9	4.268E6	0.378	D
380-388	476.250	484.248	6.380E7	2.363E7	27.02	W

Supplementary Table 4. NanoPOMP of hGLUT1 (control group: apo state) on peptide level.

Peptide Number	*m/z* unmod	*m/z* modified	EIC unmod	EIC modified	Fraction modified	Modified residue
13-21	830.480	846.477	2.711E6	4.731E6	63.57	M
62-65	520.276	552.206	2.307E8	5.139E6	1.608	W
68-72	530.307	552.303	3.077E7	3.867E6	12.01	F
73-81	854.408	870.403	6.875E6	1.298E7	62.94	M
99-102	490.269	506.264	3.563E7	7.835E6	18.02	M
102-104	350.207	366.202	1.180E8	2.449E7	17.51	F
105-110	310.177	318.175	9.440E6	8.756E6	48.35	M
120-124	618.352	634.347	1.193E7	6.513E6	35.40	M
123-127	303.192	311.189	2.427E8	7.431E6	2.971	R

140-143	509.243	525.238	1.793E7	1.800E7	54.00	M
170-174	289.170	297.173	5.347E6	2.304E6	12.53	F
175-180	635.306	651.300	4.693E7	3.570E6	7.069	M
191-194	479.286	495.281	1.165E8	1.070E8	52.13	F
195-199	526.360	542.355	5.373E7	1.715E8	23.85	Not sure
229-244	461.495	465.493	1.672E7	2.198E8	7.068	M
232-244	491.565	496.895	9.340E7	1.464E7	13.54	M
232-251	788.037	793.368	5.74E7	2.660E8	17.75	M
252-260	373.230	378.502	2.830E7	2.710E7	48.69	M
261-263	408.212	424.207	4.378E8	8.409E7	16.36	F
269-273	313.703	321.700	1.245E8	2.450E7	16.44	not sure
287-291	563.330	579.313	1.250E6	2.232E6	63.11	F
299-308	559.796	567.791	2.571E8	6.073E6	2.30	Not sure
337-341	276.679	284.676	2.644E7	3.814E6	12.60	I
376-379	483.260	499.255	1.011E8	1.636E7	13.82	F
379-388	549.785	557.782	7.239E6	6.014E6	26.14	W
380-388	476.254	484.251	8.159E7	3.423E7	29.55	W
389-395	794.481	838.471	7.456E5	7.474E8	0.100	E
435-437	392.254	408.249	2.174E8	11.26E7	33.95	F
442-444	378.239	394.234	9.617E7	3.263E7	24.88	F
445-447	426.239	442.234	2.486E7	1.323E7	34.68	F
461-467	694.341	738.330	1.366E7	3.091E9	0.440	D

Supplementary Table 5. Information of labeled peptide from TiO_2-isopropanol FPOP of hGLUT1.

Peptide	Modification Ratio (%)	Location
62-65	23.23	Extra-membrane
73-81	5.433	TM2
191-194	52.13	TM6
195-199	23.85	TM6
229-244	7.068	Extra-membrane
232-251	5.884	Extra-membrane
299-308	0.658	TM8
309-320	0.551	TM8
376-379	55.39	TM10
379-388	26.14	TM10
380-388	29.55	TM10
389-395	0.1	Extra-membrane
445-447	14.76	TM12
461-467	0.44	Extra-membrane