

***In silico* prediction aided preparation of antioxidant soybean peptides by
enzymatic hydrolysis for ameliorating lead exposure induced toxicity**

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Table S1 Parameters for optimization of enzymatic hydrolysis

Enzyme	Temperature (°C)	Optimization factors		
		pH	Enzyme dose (U/g)	Time (h)
Pepsin	37	1.2	1000	2
		1.4		
		1.6		
		1.8		
		2.0		
		1.8	500	2
			1000	
			2000	
			3000	
			4000	
		1.8	1000	1
				2
				3
				4
				5
Chymotrypsin/ Bromelain	50	6.0	2000	2
		6.5		
		7.0		
		7.5		
		8.0		
		7.5	500	2
			1000	
			2000	
			3000	
			4000	
		7.5	2000	1
				2
				4
				6
				8

Table S2 Stepwise enzymatic hydrolysis strategy

No.	Enzymatic hydrolysis strategy		
	The first step	The second step	The third step
A	Pepsin ^a	Chymotrypsin ^b	-
B	Pepsin ^a	Bromelain ^b	-
C	Pepsin ^a	Chymotrypsin ^{b+} Bromelain ^b	-
D	Pepsin ^a	Bromelain ^b	Chymotrypsin ^b
E	Pepsin ^a	Chymotrypsin ^b	Bromelain ^b
F	Pepsin ^a	Chymotrypsin ^c	-
G	Pepsin ^a	Bromelain ^c	-

16 ^a represents the enzymatic catalyzation at 1000 U/g, 37 °C and pH 1.8 for 2 h.

17 ^b represents the enzymatic catalyzation at 2000 U/g, 50 °C and pH 7.5 for 4 h.

18 ^c represents the enzymatic catalyzation at 4000 U/g, 50 °C and pH 7.5 for 4 h.

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Table S3 Antioxidant peptides and bioactivity scores

No.	Sequence	Length	Mass	PeptideRanker	Antioxidative (A_E)
1	ILLPHHADADFL	12	1360.71	0.432724	0.5000
2	VYPEKDTGRHHF	12	1484.72	0.275494	0.4167
3	QSKPNTILLPHHADADF	17	1902.96	0.325993	0.4118
4	QSKPNTILLPHHADADFL	18	2016.04	0.478314	0.3889
5	RAEKDLKDIKELY	13	1619.89	0.461512	0.3846
6	QSKPNTILLPHHADAD	16	1755.89	0.365144	0.3750
7	YLVNPHDHQNL	11	1348.65	0.290258	0.3636
8	DQDDNGIYPWETY	14	1727.73	0.3104	0.3571
9	DLNKDGVYIPWETF	14	1695.81	0.426292	0.3571
10	QSKPNTILLPHHADADFLF	20	2276.20	0.654404	0.3500
11	FDQDDNGIYPWETY	15	1874.80	0.378993	0.3333
12	REEELHNLRG	10	1251.63	0.598693	0.3000
13	RISSDLKPGM	10	1102.580 5	0.637832	0.3000
14	KPFDELFVDF	10	1255.61	0.756967	0.3000
15	TKPTLPFPWLPETD	14	1640.85	0.372352	0.2857
16	NGLHLPSYSPYPQM	14	1602.75	0.545619	0.2857
17	KPTLPFPWLPETDM	14	1670.84	0.796413	0.2857
18	KEQEQKDDRWH	11	1497.70	0.481621	0.2727
19	HRISDLKPGM	11	1239.64	0.540739	0.2727
20	RISSDLKPGMV	11	1201.65	0.529544	0.2727
21	RISADLKPGMV	11	1185.65	0.578656	0.2727
22	EWERIYDYDVY	11	1549.67	0.362009	0.2727
23	ANDAAHKSKDY	11	1218.56	0.356598	0.2727
24	FLREDGTLKPVAIEL	15	1699.95	0.180941	0.2667
25	TKPTLPFPWLPETDM	15	1771.89	0.596076	0.2667

21 Antioxidative activity (A_E) scores and PeptideRanker were obtained from BIOPEP
 22 database (<https://biochemia.uwm.edu.pl/BIOPEP-uwm/>) and PeptideRanker
 23 (<http://distilldeep.ucd.ie/PeptideRanker/>)
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Table S4 Peptides composition of ASP

No.	Sequence	Length	Mass
1	EVVFDGPLQEGR	12	1433.6899
2	QESVIVEISKKQIRE	15	1784.9996
3	FGREEGQQQGEERLQE	16	1918.8769
4	PFPRPRQPHQEEEHEQKEEHEWHRY	25	3299.5721
5	TAEVAINAIDTTVQIAGEY	19	2052.0487
6	SREEGQQQGEQRLQE	15	1800.8351
7	QESVIVEISKKQIREL	16	1898.0837
8	QKQLQDSHQKIRHF	15	1920.0078
9	SVISPPTDEQQRPQEE	16	1852.8803
10	QESVIVPISKPIRAL	16	1841.0258
11	EDKDFPTRVPTEGGR	15	1766.8071
12	GREEGQQQGEERLQE	15	1771.8085
13	QEGVIVELSKEQIRQ	15	1754.9527
14	VSIIDTNSLENQLDQMPR	18	2072.0208
15	QEGVIVELSKEQIRQL	16	1868.0367
16	ASQKAKEAKDKTMEKGGEY	19	2098.0365
17	SIGEKLGDAKQREEL	15	1671.8792
18	VGHRDVTDTGDRGVT	16	1682.8336
19	KQQLQDSHQKIRHF	14	1791.9492
20	KQEREKQIQEETRE	14	1829.9232
21	QESVIVPISKPIRA	15	1727.9418
22	SIIDTNSLENQLDQMPPR	18	2129.0535
23	NVTVPKVEKKPENKNVRQ	18	2106.1909
24	NKRVPQLENLVDY	13	1631.838
25	EDEDEDEEQDERQ	13	1664.5922
26	GLPVIKPPTPPQQRPQPEEE	21	2436.1769
27	ASQVAKETKDKTMEKAGE	18	1978.9994
28	DKVVVIVEESRPGAIAETL	19	2039.1263
29	AVSIIDTNSLENQLDQMPPR	20	2299.159
30	QKQLQDSHQKIRHF	14	1791.9129
31	TAEVAKNAKDTTVQKAGE	18	1888.9854
32	REEELKNLRG	10	1242.668
33	LVVEDLPEGPAVIIGENID	19	1995.0161
34	SVIVPPTDEQQRPQEEE	18	2137.0287
35	LVIVPPTDEQQRPQEEEE	19	2266.0713
36	YGTNTADTGTGPRS	14	1396.6219
37	QKPPLQDSHQKIVH	14	1772.9394
38	IAKNLQGENEGEDKGAIIVTVKGGL	24	2439.2969
39	REEELHNLRG	10	1251.632
40	ESVIVPISKPIRAL	15	1712.9672

41	GERDNPNTSDTRA	14	1617. 7132
42	ASQVAIETKDITMEKAGEY	19	2142. 0627
43	NGERVFDGPLQEGRV	15	1703. 8227
44	FVDAQPQQKEEISIIR	16	1802. 8911
45	VVIKPPTDEQQRPIDEE	17	2007. 9861
46	HPRPHQPHQKEEEKHEW	17	2228. 0624
47	KIMDNQSEQLEGKEKKQMERELM	23	2821. 3772
48	SQEQLKPKPQGEQDPIKY	17	2015. 0324
49	KQQEEENEGSNILS	14	1603. 7326
50	AAEVAIEGKDATVNIMGEY	19	2038. 9994
51	NDLGDPDKGENHARPVL	17	1845. 8969
52	VIKPPTDEQQRPQEEEE	18	2179. 0393
53	ERVFDGPLQPGVVL	14	1645. 8424
54	RHNIGQTSSPDIFNPQ	16	1809. 8758
55	RPQHPERERQ	10	1331. 6807
56	VGLVEQQQEQQEEQPLE	18	2167. 0393
57	LAGEKDNVVR	10	1099. 5986
58	ETRVETEGGR	10	1132. 5473
59	VELSKEQIRQ	10	1228. 6776
60	QGGTQSQKQKRQEEENEGGSIL	23	2487. 195
61	GDHTSQITIEHLEPNLEGL	19	2117. 0389
62	GENEEEEKGAIVTVKGG	18	1857. 932
63	DGVGERKPHDRIYD	14	1716. 818
64	KHQEEENEGGSILSG	16	1740. 7915
65	HGGIATDDDYPR	13	1478. 6426
66	VIKPPTDPPPPRPQE	15	1791. 9115
67	LVVLQDPHQKIR	12	1507. 7855
68	QREEQEWPRK	10	1384. 6848
69	EILEPNLPGLTVDEAIQPKRL	21	2417. 2551
70	AQQLEKQAQVK	11	1269. 7041
71	QQQLQDSHQKIRHF	13	1663. 8543
72	QQQLPDSHQKIRH	13	1644. 8444
73	AAARDAKVEARDVKR	15	1654. 9227
74	STRVETPGGSIRVL	14	1502. 8053
75	NSLENQLDQMPR	12	1443. 6776
76	REWWDSIPIVPIRV	14	1764. 9675
77	TVDEAIQNKRL	11	1285. 699
78	SVIKPPTDPQQRPIDEE	16	1878. 9436
79	SVAELDPQAARQ	12	1343. 6793
80	SSRVTISSDKPF	13	1480. 7522
81	QQQQQKSHGGRK	12	1408. 7284
82	FAIGINAPNNQRNF	14	1606. 7852
83	INDIFEKLAQESSRL	15	1761. 9261
84	KEQHQHDKPKGVIISM	17	1932. 9112

85	DKVVVKVEESRPGAIAET	18	1926.0422
86	AIGINAENNQR	11	1198.6054
87	DKVVVKVEESRPGAIAE	17	1824.9945
88	KQIAKNLQGENEGEDKGAIVT	21	2241.1601
89	KGKHQQPPPNEIPSIL	16	1781.8544
90	AIHATQGSTQQLGPL	15	1520.7947
91	DSAPPKIMDKARE	13	1496.7406
92	INDIFEKLAQEASRL	15	1745.9312
93	IGINAENNRNF	12	1388.6797
94	SFHSEFEEINRVLL	14	1718.8628
95	RHNIGQTSSPDIYNPQAGSVTTA	23	2413.1622
96	TAEKAKEGKDTTLGKLDEL	19	1988.079
97	LLQVSHQKIRHF	12	1535.7957
98	KVEAEKARPMEE	12	1415.7079
99	AAKVIGDINRTNERDEGY	18	2035.9559
100	HYQPQHGYPLR	11	1465.7215
101	EITPEKNPQLRDLD	14	1666.8526
102	VVVPDNNENLRL	12	1395.7106
103	GDHVSQITKEHLEPNLEG	18	2003.9548
104	GNKLPKIPPKLVRR	14	1711.0105
105	EILEPNLEGLTVDEAIQNKRVF	22	2564.3235
106	VIKPPTDEQQRPQEEE	17	2049.9967
107	SVEEITQQQLERVF	14	1704.8683
108	NAAEQHLTNSVEEITAAALERVY	23	2683.3202
109	LTVDEAIQNKRLF	13	1545.8515
110	LEPGQSTPPSAQSGKDNPPGF	21	2215.9652
111	NALEPDHRVESEGGLIQTW	19	2150.0392
112	AAEVAKNAKDTTVQKAGE	18	1858.9749
113	QEPQESQQRG	10	1185.5374
114	QHQQEPPPVGGSVL	14	1597.6856
115	AIGINAPNNQRNFL	14	1572.8009
116	NARPQGVNNNGPPKL	15	1574.8277
117	IFEEKDFETRVEGGRIRVL	22	2637.3398
118	LATGAIIAAHAIATGDLVSL	20	1866.9687
119	LVPEQIRL	8	1000.5665
120	RHNIGQTSSPDIFNPAAGSITTA	23	2411.1829
121	QVVDISGNPIFPIPTY	16	1662.8253
122	FNNQLDQNPRVF	12	1490.7266
123	VNPESQQGSPR	11	1197.5738
124	QDSHQKIRHF	10	1294.6531
125	RHNIGQTSSPDIYNPQAGSVT	21	2241.0774
126	SVIVEISKEQIRA	13	1470.8406
127	ERIKEKLPGHHTH	13	1580.8536
128	RHNIGQTSSPDIYNPQA	17	1896.9078

129	KEQEQKDDRW	11	1497.6961
130	LAIEKDNVVLQ	11	1227.6571
131	ESVIVPISKEQIRA	14	1599.8832
132	NKVDENGTPKPSSL	14	1484.7471
133	KEQEQKDDRW	10	1360.6371
134	EGKDEDEEEEGHM	13	1532.5573
135	FEITPEKNPQLRDLDF	17	2060.0579
136	GDHTSPITKEHLEPNL	16	1817.8908
137	FETRVETEGGR	11	1279.6157
138	VKIDANEEKNKDLASQY	17	1935.9538
139	AIGINAENNQRN	12	1312.6484
140	AIGINAENNQVNF	13	1459.7168
141	KTAQAKDNAKENVSGAdegAVR	22	2315.1578
142	LKEQQQPQQEEQPLE	16	2010.9494
143	LVRPQDRHQKVH	12	1514.7815
144	FEIVPEKNPQLRDLDFL	18	2173.1419
145	NIHFEWDGSMGIPGAF	16	1776.793
146	QGGHQEEEEEGGSVL	16	1782.7656
147	GNKLKPIPKLARK	14	1654.973
148	ETRVETPGGRIRVL	14	1613.8849
149	FVDAQPQQKEEGSKGRKG	18	1988.0076
150	DVHQKIRH	8	1019.5261
151	QRPQDRHQVVH	11	1427.7494
152	IFEEDPDFETVVE	13	1655.7679
153	QQQEQQQEEQPLEVRK	16	2023.9923
154	EPKQKKKMEKELINL	15	1887.0499
155	AGKDNIVSSLDNVAKE	16	1658.8475
156	GPLVNPPSQQGSPR	14	1464.7321
157	RIKEKLPGHHTH	12	1451.811
158	KSSSPKTISSDKPF	15	1695.8792
159	NQRSPQLQNLVDY	13	1630.8176
160	SVIVEISKPIRAL	14	1583.9247
161	AGKDEKQDLIVTPTG	16	1589.7533
162	AIHATQGSTQQLGPLVT	17	1720.9108
163	GIPSQKGPHQQEEENEGPIIL	21	2319.084
164	LESELGDFERAMY	14	1645.7294
165	LSSRPDPHQ	10	1237.5912
166	SSRPQDRHQKIYN	13	1627.8179
167	EGQQQGEQRLQE	12	1428.6593
168	LVLPVQNDASTGLHW	15	1648.8573
169	AQAKENTKENVSGAGETARR	20	2116.0621
170	QVLQDSHQKIRH	12	1516.7859
171	RKPQQEEDDDDE	12	1502.6121
172	ATNPAQSPPGTIRPDF	16	1659.7853

173	KELELDKF	8	1020.5492
174	GSVDNVISQIPSQ	13	1371.6994
175	FEEPQQPQQRG	11	1342.6266
176	IQIDDDGIPR	10	1199.6258
177	EITPEKNPQLRDLDF	16	1927.0051
178	RQNIGQNSSPDIY	13	1490.7114
179	YEITPEKNPQLRDF	14	1748.8733
180	GINAENNQRNF	11	1275.5956
181	HRISDLKPGMV	12	1338.7078
182	GIDTDRQQHGTTGGY	15	1604.7179
183	LVVVVGNVVDRY	12	1391.7045
184	SFEWVLEHGGIATDDDY	19	2212.9589
185	VGQKTKEVGQDIQSKAQDTRE	21	2344.1983
186	GENEGEDKGAIVTVKGGLS	19	1858.9272
187	LAGSKDNVISQIPSQ	15	1555.8206
188	VVNPDPNNPNLRLIT	14	1609.8424
189	FNPKPNTL	8	919.47633
190	QSSRPQDRHQKIY	13	1641.8336
191	GLSVIKPPTDEQQQRPQE	18	2049.0491
192	FPFPRPRQPHQEEEHEAKEEHEW	23	3025.3856
193	PRPQPRQEEEHEQREEQEWPRK	22	2897.3917
194	QSSRPQDRHQKIYN	14	1755.8765
195	ERVFDGPLQPGQVL	14	1617.7999
196	SPKWQEQEDEDEDE	14	1762.6806
197	PFELPSEEVLR	11	1315.6521
198	TVDEAIQNKRLFL	13	1545.8515
199	AGEVDNVVPQ	10	1114.5731
200	KSENQIQDNGQKGY	14	1607.754
201	NKIQDKVTIDGYETL	15	1735.8992
202	LVKGKHQQIIINEGGSILSG	20	2140.9985
203	TNRGPGGTATAHNIRA	16	1580.7768
204	NGTGPRKEYDRIYD	14	1714.7911
205	LEEKQKKKMEKELINL	16	2000.134
206	LTLEDVPNQGTIRF	14	1601.8413
207	LNKVDPNGTPKPSSL	15	1597.8312
208	YEITPEKNPQLRD	13	1601.8049
209	AGSKDNVISQIPSQ	14	1442.7365
210	FEITPEKNPQLRD	13	1585.81
211	RAEKDLKDIKELY	13	1619.8883
212	RQNIGQNSSPDIYNPAAGSITTA	23	2431.1728
213	YVNPDPNNENLRL	13	1558.774
214	QVPVLVDLNGNHL	13	1416.7725
215	QHKQEKHQGKESEE	14	1720.8129
216	SEGSESQREPRR	12	1416.6706

217	DGELQEPPVLIVPINF	16	1713.8574
218	AAEVAINAKDTTVQIAGEY	19	2022.0382
219	LQGENEEEDSGAIVTVK	17	1816.8691
220	ARDDDVKNDSSELQHW	15	1826.8184
221	GGAVDTIGSVDHITTPLA	18	1751.9054
222	VRNELDKGIGTIISSPY	17	1848.9581
223	HEQREEQEWPRK	12	1650.7863
224	NLKSAAAPF	9	1071.5785
225	SLENQLDQMPPR	12	1485.7358
226	TGGNKDQTREEEEETRR	17	2033.9362
227	PFPRPRQPHQEEEHEQKEEIEW	22	2878.3172
228	SQRPQDRHQKVHRF	14	1817.951
229	SLVANEDFQHILR	13	1540.7998
230	SQKQQLQDSHQKIRHF	16	2007.0399
231	DGELQEGR	8	902.40937
232	LVAKDNAKINVSGADEGARR	20	2086.0152
233	KNLQGENEGEDKGAIVT	17	1800.8854
234	TAEKAKNAKDTTVQ	14	1503.7893
235	GVTVPVPGGTGGKSLIAQQHL	20	1963.9963
236	NATEAAVEPY	10	1151.5571
237	DREIDIGVPDEVGRL	15	1681.8635
238	VASLVYPSVLT	11	1219.6561
239	LAGEPDNVVRQIE	13	1469.7838
240	FETRVPTGGIRIVL	15	1760.9533
241	QDVRDLHEGGIKLPTE	16	1805.9272
242	KKEEESREREEEQEQHEEQDENPY	25	3231.3825
243	LAGSVDNVISQIPSVQE	18	1911.9902
244	LVPPQESQKRA	11	1251.6935
245	VEISKEQIRAL	11	1284.7402
246	DGKGERKEHDVIY	13	1601.791
247	KLHENIARPSRADF	14	1652.8747
248	NKLVEIEEKL	10	1242.7184
249	LQGENEGEDKGAIIVTVK	17	1785.9109
250	FWPAKGQTPLFPRIF	15	1835.9723
251	GQRDNPHWTSDSKAL	15	1710.8074
252	LVIQQEQEQEQEQPLEVRKY	20	2557.2772
253	PFPRPRQPHQEEEHEAKEEHEWH	23	3015.3761
254	LSLVNDDRDSY	12	1409.6423
255	VVPESQQGSPRV	12	1296.6422
256	QGENEGEDKGAIIVTVKGGL	19	1899.9538
257	SQKVKHQEEEENEGGSIL	18	1996.945
258	AYEEIYQEDLIKR	13	1668.8359
259	RHNIGQTSSPDIFNPQAGSIVT	22	2340.1458
260	NAVFDGELPR	10	1175.6047

261	ATLDAKPRLDLDAP	14	1494.8042
262	AIGETIAEIAETTRVM	16	1703.8764
263	LEEVPKKKMEKEL	13	1659.9229
264	VEISKKVIPE	10	1228.7139
265	SEISEDSELLR	11	1335.5903
266	SSRPVDRHPK	10	1237.6276
267	KGGAKKVIIISAPSKDAPMF	19	1944.0867
268	NGERVFDGELQEPPVL	16	1717.8271
269	LKPQQARL	8	957.53558
270	IVTVKGGLR	9	941.6022
271	QQEEQPLEVRK	11	1382.7154
272	NLQSGDALRVPAPTTY	16	1661.8373
273	SQKGKQQEEENEGSNIL	17	1916.9076
274	LVVEDLPEGPAVKIGENKDAMDGW	24	2555.2214
275	AQGRINEATQGAY	13	1377.6637
276	IGINAENNQRNFL	13	1501.7637
277	KANKIQDKVTIDGY	14	1591.857
278	VNPESQQGSPVVK	13	1424.7372
279	LPEGPAVIIGENIDAMDGW	19	2025.983
280	HPRPHQPHQ	9	1132.5639
281	VLPVQNDASTGLHW	14	1535.7732
282	VIPEGEANIELVGIKEQPQRQ	21	2394.2503
283	INAENNQRN	9	1071.5057
284	VQNIGQNSSPDIYNPQAGSIVT	22	2360.1357
285	DKARDVKERA	10	1186.6418
286	QRPVPRHQKVHRF	13	1730.919
287	RHNIGQTSSPDIF	13	1470.7215
288	QHQPVEEEGGSVL	13	1467.659
289	VEISKEVIPA	10	1171.6561
290	DEDEDEEQDERQ	12	1535.5496
291	RHNIGQTSSPDIFNPQA	17	1880.9129
292	GSQVAIETIDATIEKAGEY	19	2068.0437
293	FEEPQQKGQSSRPQDRHQ	18	2181.0311
294	PPFPRPPHQKEERK	14	1791.9533
295	EEVVVEVEDGVVL	13	1499.7831
296	LATVAIEAAHAIATGDLVS	19	1753.8846
297	EEINRVLLGEE	11	1299.667
298	KDPNSESRSND	11	1247.5378
299	GQSSRPQDRHQKIY	14	1698.855
300	VIKPPTDEQQRP IEE	16	1920.9541
301	TAEVAPEGKDTTL	13	1390.7304
302	FFFPAPPHF	9	1121.577
303	IEDPFDQDDWEHY	13	1707.6689
304	LQDSHQKIRHF	11	1407.7371

305	VVLPVQNDGSTGLHW	15	1620.826
306	LIPEDLPPGPAVKIGENKDAM	21	2197.0936
307	LNALKPDNRIESEGGF	16	1758.8901
308	ESEDESLAR	9	1119.5156
309	VPIPQHHTNPTKPINL	16	1804.9948
310	ANKIQDKVTIDGYETL	16	1806.9363
311	ERVFDGELQEGGVL	14	1546.7627
312	EAISNQGTILF	11	1234.6306
313	LEATKPTLPFPWLPETDM	18	2085.0493
314	GKHQQPPPNEGGSIL	15	1653.7594
315	DEQRPPIPFPRPQPRQ	16	1957.0282
316	KLGELKDSAADAAKR	15	1571.8631
317	DRHAKVHRF	9	1221.6479
318	FIYDELAERR	11	1425.6888
319	LAPIDTKPVTH	11	1219.6561
320	HNIGQTSSPDIYNPQAGSVTTA	22	2257.0611
321	RNELDKPIGTIISSPY	16	1761.9261
322	IFEEDIDFETRVETEGGRI	19	2269.0863
323	DEDEDQPRK	9	1130.484
324	TVAEVIGSNVVSVAEDEL	19	1948.9299
325	GHRNPEEIPWGSGAD	16	1721.7758
326	MVNLNMGSI LGPHW	14	1567.7639
327	RPIGQTSSPDIFNPQAPIIT	21	2239.0982
328	FDIELQEGVVL	11	1261.6303
329	QKHYDDQGRKVDE	13	1616.7543
330	KGQSSRPQDRHQKIY	15	1826.95
331	IMEKIQAGRR	10	1200.6761
332	AAKDLEDANRLRDNTF	16	1847.9126
333	LPQDRHVKVH	10	1299.6908
334	YQEPQESQVLG	11	1348.6008
335	DELVIVIPTIRN	12	1396.7562
336	EITPEKNPQLRDLVFL	17	2026.0735
337	KLQSPDDERK	10	1214.6255
338	RHNIGQTSSPDIY	13	1486.7165
339	ERVFDGELPE	10	1220.5673
340	DMTIGGQPAGRIVMELY	17	1849.9066
341	GEEEEQRQ	8	1003.4207
342	ELKDSAADAAKR	12	1273.6626
343	APAMRKPQQEEDDDDE	16	1872.7796
344	FNSNKINAYPSVD	13	1467.6994
345	IKLPTDILSKISPLPVL	17	1846.1543
346	GSKDNVISQIPSQVQE	16	1727.869
347	RESESESELVR	13	1620.734
348	TNDRPSIGNLAGAN	14	1398.6852

349	NGERVFDGPLQEPPVL	16	1788.8642
350	QESVIVPISKEQIR	14	1656.9046
351	QSKPNTILLPHHADADFL	18	2016.0429
352	NHAITPLKPSAPKIPLEVL	19	2037.1986
353	NKLAQIENKL	10	1169.6768
354	VMDKPNGPVWR	11	1297.6601
355	AAEKAKNAKDTTVQ	14	1473.7787
356	RSQVPQDRHQKVH	13	1670.8826
357	SVGEGVTHLKPGDHALPVF	19	1959.0214
358	LNALEPDHRVESEGGL	16	1734.8537
359	PAMRKPQQEEDDDDE	15	1801.7425
360	EDPPEGPAVKIGENKDAPIGW	21	2270.0525
361	RVETEGGSIRVL	12	1314.7256
362	IRETAPASE	9	1029.5091
363	SRHASDEVY	9	1062.473
364	STRVETEGGSIVV	13	1389.7212
365	AIKKKDEIERVAKANR	16	1868.0956
366	IDLSVIEILSR	11	1256.734
367	VVEVLPEGPAVKIGENKD	18	1907.984
368	LERVSDDEFNNY	12	1499.6529
369	STSDPPPLFDGTTILY	16	1765.8523
370	GQHQQPPPEEGGSVL	15	1654.7071
371	IRETQPASELL	11	1256.6361
372	DGTGERKEWERIY	13	1637.7798
373	ASGAAQKTKDY	11	1138.5619
374	VGAKDTIGSVDHITPL	17	1680.8683
375	IVPEPIPA	8	943.54508
376	SLVNNDDRVSY	11	1296.5582
377	KKPENKNVRQ	10	1239.7048
378	NNQLDQTPRV	10	1183.5945
379	SAWMTDEEFAREM	13	1601.649
380	EKGSEEEDEDEEEQ	15	1795.6392
381	QSGDALRVPSGTTY	14	1450.7052
382	SRIELDKGILT	11	1188.6099
383	FEEINRVL	8	1018.5447
384	SRPQDRHQKIY	11	1426.7429
385	LKEVIEQQQEEQPLEVRK	19	2394.2139
386	HRISDLKPGM	11	1239.6394
387	KEEEKHEW	8	1113.5091
388	AQGVPNATQGTY	13	1407.6743
389	DQDDNGIIPWETY	14	1727.7315
390	IPVKNPGAF	9	1026.5974
391	HVDWRETDKAHIF	13	1652.8059
392	NDDTNRHHG	9	1064.4384

393	RVSDDEFNNY	10	1257.5262
394	AGSKDNVISQIPSVQE	17	1798.9061
395	PVNKPGRY	8	929.5083
396	PVNPPGPF	8	913.51339
397	VLEHGGIATDDDYPY	15	1663.7366
398	FHSEFEEINRVLL	13	1631.8308
399	NDLGNDHVEN	11	1180.4745
400	DVRDLHEGGIKLPTE	15	1677.8686
401	QSKPNTILLPHHADAD	16	1755.8904
402	LNKELELDF	10	1247.6762
403	VADQHQQEEHQLDQQKRG	18	2173.0261
404	LAGSKDNVISQIPSVQEL	19	2025.0742
405	LGVINEATQGTY	12	1336.6371
406	VDLSVIEILSRHASDEVY	18	2044.0477
407	NKELELDF	9	1134.5921
408	NRNGLHLPSYSPY	13	1516.7423
409	TLIDLSVIEILSRH	14	1607.9247
410	NIGQNSSPDIYNPQAGSITT	20	2075.976
411	RAGHPEWPLPDDAIKY	16	1839.854
412	TVDEALASRRLF	12	1376.7412
413	FETRVPTGGRRIV	14	1647.8693
414	VDNEPIFHGRT	11	1283.6258
415	LNALKPDNRIESEGL	16	1724.9057
416	DINEEELRPF	10	1260.5986
417	LAELSEDDIF	10	1193.5564
418	KNSWGEDWGEDY	13	1541.6059
419	SRNELDKIIG	10	1087.5622
420	NHAITPLKPSAPKIPLE	17	1825.0462
421	ANHTYVPSETPAPLVE	16	1723.8417
422	LFEELNNDLF	10	1295.6146
423	EGQQQGEERL	10	1172.5422
424	TPANWKPGDPVVITPDVTNE	20	2149.0691
425	EFFGPGGRDPESVL	14	1505.7151
426	AAARDARDARE	11	1200.5959
427	NALKPDNRIESEGGF	15	1645.806
428	QPRRPRQEEPRE	12	1576.8182
429	AAGVKDMLDRHF	12	1358.6765
430	LADKARDVKE	10	1143.6248
431	EGGIKLPRDVIST	13	1383.7722
432	FVDAQPQQKEEGSKG	15	1646.79
433	IAKNSWGEDWGEDGYIW	17	2024.8905
434	TPSVIEPSFGIGRIIY	16	1747.9509
435	LAIPVNKPGLF	11	1210.7186
436	RGPTVTDPNTEKQGEVF	17	1873.917

437	ARDTV DGWF	9	1065.488
438	GIIELKGPKQY	11	1244.7129
439	ETIHVQDATGHEF	13	1482.6739
440	RIDPELEKEIGAKF	14	1643.8883
441	FEEV I IKGSSRPQDRHQK	19	2309.1261
442	PDNNENLAL	9	1083.5309
443	SKDNVISQIPSQVQE	15	1670.8475
444	HNIGQTSSPDIFNPQAGSITT	21	2184.0447
445	EQE QEQAERQ	10	1273.5535
446	LSQVPVDVHQ	10	1306.6603
447	AI SNQGTIPF	10	1105.588
448	GVRDVGKF	8	876.48175
449	LSRPQDRHQKIY	12	1513.775
450	HSEFEEINRVLL	12	1484.7623
451	KVPPLVVL	8	924.57565
452	HFREGDLIAVPTGF	14	1557.794
453	YVVNPDDNENLRLI	14	1671.858
454	IFVVDKDFETRV	12	1526.7253
455	NNKQELDERARQ	12	1499.7441
456	VQSVNILDKGIGTIISPY	19	2076.0851
457	AGVTVSKRT	9	917.52943
458	GNVEKQTDE	9	1018.4567
459	PPQESQKRA	9	1039.5411
460	LAGVQINVISQIPSQVQEL	19	2025.0378
461	NALEPDHRVESEGGLIQT	18	1963.9599
462	TAKVPEEAQRELE	13	1558.8315
463	ANHTYVPSETPAPL	14	1495.7307
464	ASEASDVAQNTKDY	14	1497.6583
465	IDHDDGTRR	9	1083.5057
466	LAELSEQDIF	10	1206.5881
467	QLIDSHQKILH	11	1388.7273
468	VLAPDAHF	9	1150.5592
469	VYPEKDTGRHHF	12	1484.7161
470	AELDKQAAPQ	10	1128.5887
471	KREQDEDE	8	1047.4469
472	NIGVTSSPDIYNPQAGSVT	19	1947.9174
473	FYEITPEKNPQLRD	14	1748.8733
474	LVVLPVQNDGSTGLHW	16	1733.9101
475	STSAKKNHPPQL	12	1356.715
476	NQLDQNPRVF	10	1229.6153
477	KQIQEETRE	9	1159.5833
478	PFELPSEEVG	10	1159.551
479	GARQLEENLVVF	12	1373.7303
480	NALPEEVIQHTF	12	1396.6987

481	AENKPDNRIPGEIYY	15	1759.8741
482	VINEGEANIELVIIKE	16	1725.9149
483	AAKDLEDANLL	11	1214.6255
484	DGELQPGGVLIVPQ	14	1452.746
485	EWVLEHGGIATDDDYYP	17	1978.8585
486	GVVVIDGSTVRDF	13	1362.7143
487	HEMGTKGGQTRK	12	1328.6619
488	EDLVVQVEENKIL	13	1555.8457
489	QDVRDLHEGGIKL	13	1478.7841
490	AAEKAKPGKDATVN	14	1430.7365
491	EITPEKNPQLRDFDIL	16	1927.0051
492	QPRQEEHEQREEQEWPRK	19	2547.1851
493	RPQHPEREPQQPGEKEEDE	19	2314.0574
494	TAIVETVSSAGEKVKKPF	18	1847.9993
495	SVDKQIAKN	9	1001.5506
496	TAEKAIEGKDSAVGKLDEL	19	1915.0262
497	MQVPVLVDLNGNHLW	15	1733.8923
498	LRSPDDERK	9	1114.5731
499	GSQDNVISQIPSQVQE	16	1727.8326
500	GQHQQQPPEGGSVL	14	1524.6805
501	KDWVFTDQALPADL	14	1617.8039
502	KAADQIAGQTF	11	1148.5826
503	LPEGPAVKIGENKD	14	1465.7777
504	QSIRPQDRHQK	11	1365.6862
505	EPFFGPGGRDPESVL	15	1634.7577
506	EIFVPELDGPIMF	13	1524.7534
507	NKIQDKVTIDGY	12	1392.7249
508	IPIPWVLDIGESNHDIF	18	2092.0629
509	ARDDDVKPDSELQQW	15	1800.8279
510	NQRSPQLQ	8	969.49919
511	GRVLIVPQN	9	994.59236
512	EKHQGESEE	10	1199.5418
513	GRVGEVISRTW	11	1258.6782
514	WDLTEGNRNAS	11	1321.6051
515	EVVKVEVEDGRV	12	1386.6991
516	SVHLEDEVSKETSIDY	16	1793.7956
517	NVTVPKVEKKPENKNVRQIDVV	22	2532.4388
518	GGNDTFPYPRR	11	1278.6105
519	LTLEDIPNHGSIHF	14	1591.7995
520	RISDLKPGMV	11	1201.6489
521	SVEPAESRRPF	11	1273.6415
522	AISKDISEGPPAIKL	15	1537.8716
523	RISADLKPGMV	11	1185.654
524	HAHVDWRETDKAHIF	15	1860.902

525	VGIRVNGVAPGPIWTPL	17	1774.0254
526	NDDTNRHHGTTGVY	14	1585.6869
527	EWSVVEDLPEGPAVK	15	1653.825
528	TRVVTEGGRIVVL	13	1484.8423
529	SNIVETFEENLGGIGEKRE	19	2120.0386
530	GRKPTRKDPNSESRSND	17	1942.9569
531	QLETAAGAAIRFF	13	1393.7354
532	SFNTNEDTAEKL	12	1367.6205
533	AGIAAQKSVLY	11	1152.5411
534	MEEVAKAEQKKIGMTETW	18	2137.0548
535	EEDQPRPDHPPQRPSRPEQQEPRG	24	2861.3553
536	ITVNEAQSRG	10	1073.5465
537	LVQSRNILDKGIGTIISPY	20	2175.1535
538	QWPPDVHL	8	1063.5271
539	GPTTGDKIRLGDTDL	15	1557.7999
540	QSKPNTILLPHHADADF	17	1902.9588
541	TLEDVPNQGTIRF	13	1488.7573
542	PEGPAVKIGENKDAMDGW	18	1912.8989
543	GEPDNVAF	9	1043.536
544	NALEPDHVVE	10	1178.568
545	NSKPNTLLLPNHADADYL	18	1995.0062
546	KGLKDKINLVPINL	14	1563.9712
547	TETRVDPQEIVDLF	14	1660.8308
548	EWVFDGEL	8	963.46616
549	GVTVSKRT	8	846.49232
550	QSFEEVLE	8	1036.4866
551	AVGAEAENELIELL	14	1469.7613
552	LKVREDENNPf	11	1359.6783
553	SRINELVIPF	10	1161.6506
554	VPVLVDLNGNHLW	13	1474.7932
555	VHVDKFEEKKDSVL	14	1671.8832
556	QDVRDLHEGGIKLPTEVIS	19	2105.1117
557	VSPVHFDSEVVFF	13	1564.7674
558	SGDVWFPPAPKDHPW	16	1862.874
559	ITPEKNPQLRDLDF	15	1783.9468
560	KTAQAKENTKENVSGAGETARR	22	2345.2047
561	NALEPDHRVESEGGL	15	1621.7696
562	LNVLENSLPKPY	12	1444.731
563	FEPPQQKGQSSRPQDRHQKIY	21	2585.2735
564	NGERVFDGEL	10	1134.5306
565	VMNGGMQPRA	10	1059.4954
566	KETKKRLEERF	11	1462.8256
567	LEVEVEEDPEL	12	1445.6409
568	LRPQDRHQKVHR	12	1583.8505

569	ANHTYVPSPTPAAL	14	1469.7151
570	ASGGAQKTVLY	11	1124.5462
571	AIPVKNKPGRY	10	1113.6295
572	IPFPRPQPR	9	1106.6349
573	VSANVLPLL	9	981.58588
574	NKVVENGTPKPS	12	1284.631
575	NDLGNDPKSEKLARPVLG	18	1922.0221
576	AFSATGAIEAAHA	13	1215.5884
577	DGELQEGPVL	10	1114.5619
578	LDLVLLPLPSHF	12	1378.7497
579	EIYQEDLIPR	10	1305.6929
580	TATAHNTAA	9	941.46789
581	SLPHPAGDLSGAVSQ	15	1434.7103
582	LGGKSGAGA	9	716.3817
583	PVPRPPHL	8	974.50863
584	IDDDGIPR	8	958.48321
585	AWMTDEEFALE	11	1383.5765
586	NKFVPKQPNMILQ	13	1555.8545
587	RYEGDEINVLf	11	1368.6674
588	TQGSTQQLGPLVTVPQFL	18	1913.0258
589	DLNKDGVYIPWETF	14	1695.8144
590	KEGSSIINTTSVNAY	15	1582.7839
591	FEVNVNRDNKKF	11	1394.7306
592	LQRDDVELVAVNDPF	15	1728.8683
593	RVPTVDVSVVDLTVRLEKEASY	22	2474.3381
594	PAVKIGPNKDAMDGW	15	1629.7821
595	DAKGQTPLFPRIL	13	1454.8245
596	DEQPRPIPFPRPQPR	15	1828.9696
597	VKGHPDKDARDTLEM	15	1742.8257
598	GNKLAQIENKL	11	1226.6983
599	LNIGQTSSPDIY	12	1330.6153
600	IVNRDENEKL	10	1228.6412
601	ALPEEVIQHTF	11	1282.6558
602	NVISQIPSQ	9	984.52401
603	VPFEEAKKF	9	1140.5928
604	NGPRLTPGHRIQF	14	1588.8586
605	ITDQKISAIKDIIPL	15	1666.9869
606	TIVQSRNPLDKGIGTIISIPY	21	2276.2012
607	ITPEKNPQLRDLVFL	16	1897.0309
608	GKGSEEEQDEREHPRHQPHQ	21	2506.1334
609	ISKKQIREL	9	1113.687
610	NTNEDTAEKL	10	1133.52
611	PGLTIGDTIPDLQ	13	1338.7031
612	YIRETQPASENL	12	1419.6994

613	WAISKDISEGPPAIKL	16	1723.9509
614	EDKDFETRVELEGGRIRVL	19	2248.1448
615	LISNASDALDKLRF	14	1561.8464
616	KTNDRPSIGNLAGANSL	18	1839.9803
617	DKIRLGDTDL	10	1144.6088
618	FEITPEKNPQLR	12	1470.7831
619	LVVEDLPEGPAVKIGENKDAMDGWY	25	2702.2898
620	ATVQEKAERM	10	1161.5812
621	QFPFPVPPPQ	10	1249.6356
622	LAFPGSAQDVERL	13	1401.7252
623	ASDVPIRIGINGF	13	1417.8041
624	SKIQTPTDEVVVPY	14	1574.8192
625	TNRPGGTATAH	12	1138.5479
626	AFEEAEKNAPSIIF	14	1564.7773
627	LEEKQKKKMEKELIN	15	1887.0499
628	VQELAFPGSAQDVERL	16	1757.8948
629	VVQSPNPLDKGIGL	14	1467.7933
630	RINTDRGVM	9	1060.5448
631	QGGHQQQEEEGGSVL	15	1652.739
632	VLPPHFDSE	9	1072.4938
633	NGERVFDGPLQEGR	14	1604.7543
634	DGTGERKEWPRIYD	14	1752.8067
635	PFPVPVQPHQ	10	1258.6683
636	NELDKGIGTIISSPY	15	1605.825
637	ALEPDHVVE	9	1064.5251
638	FLKNDGTLVPL	11	1272.719
639	KGKVGKDTFL	10	1091.6339
640	NMVDPDEKDSTGNLPSRA	18	1944.8847
641	SAEKTVEGTKAAA	13	1261.6514
642	VFTDQALPADLIKRG	15	1642.9043
643	FPPPRIPHQIEERIQEED	19	2422.1666
644	LAELSEDDVF	10	1179.5408
645	LVNVPLVVQ	9	1011.6077
646	LSVEVIAAL	9	1113.6506
647	LVEDLPEGPAVKIGENKDAMDGW	23	2468.1893
648	TPANWKPGDPVVIT	14	1493.7878
649	AGSKDNVISQIPSQVQEL	18	1911.9902
650	AISKDISEGPPAIK	14	1424.7875
651	KIMVKAREIKDY	12	1508.8021
652	PGLTIGDTIPDL	12	1210.6445
653	RSKKTQPRRPRQ	12	1536.9073
654	NIGVNSSPDIYNPQAGSIT	19	1974.9283
655	NIPQNSSPPIYNPQAGSITTA	21	2147.0131
656	VMDKPNGPVWRISGEDL	17	1911.9513

657	VSESETEKITLEPGDM	16	1763.8135
658	RPQDRHQKIY	10	1339.7109
659	SIRINQHSVFPL	12	1409.7779
660	GVMNGGMQPRAE	12	1245.5594
661	LVNDDRDSY	10	1209.5262
662	RISSDLKPGM	10	1102.5805
663	VIDGVGHLF	9	993.53558
664	HGGEYPPLSEPDIGVLL	17	1791.9043
665	ANLQKRTPL	9	1039.6138
666	RADLPGVKKEDL	12	1339.746
667	AISREQVRA	9	1028.5727
668	DSKHDKSSPSY	11	1249.5575
669	FKTNDRPSIGNL	12	1360.7099
670	GLKSVSQNVLP LLQ	14	1494.877
671	EITPEKNPQLRDL DV	15	1765.921
672	ARFEEMNMDLF	11	1401.6057
673	ENEGEDKGAI VTVKGGL	17	1714.8737
674	ERVSDDEFNNY	11	1386.5688
675	GNVEKQTDEY	10	1181.52
676	PAMRKPQQEED	11	1327.619
677	QSRVELDKGIGTI ISSPY	18	1977.0167
678	WEAKGQTPLFPRI F	14	1688.9039
679	KEKTEEVAASAGEAL	15	1531.773
680	DLANNKVAKVLITY	14	1560.8875
681	SERNNDEKLRN	11	1373.6648
682	AAKELEQLNREKDRDF	16	1960.9967
683	FEVNARDNKKF	11	1366.6993
684	QQQHQP HR	9	1220.5799
685	EGGIKLPRDVIS	12	1282.7245
686	STGGKAPRK	9	900.51411
687	DAKGQTPLFPRI LG	14	1511.846
688	VVSGDLAQKPVAPED	15	1523.7831
689	IVNRDENEKLL	11	1341.7252
690	QKAVDQSDASAIQ	13	1359.663
691	STSAKKNHPQF	11	1243.6309
692	KVREDENNP FY	11	1409.6575
693	DKPNGPVWRISGED	14	1568.7583
694	SAAVSQVVLPAKEGVESTIW	20	2070.0997
695	DDQGRKVDE	9	1060.4785
696	VAPVDAHAK	9	1150.5956
697	ELAFPGSAQDVERLL	15	1643.8519
698	AFGINAENNQRNFL	14	1606.7852
699	FPFELPPEERGR	12	1462.7205
700	GKIALVTGGDSGIGRA	16	1470.8154

701	NSVKINAYPSVD	12	1320.631
702	RLIDLRIPTAY	11	1345.7354
703	EDEQPRPIPFPRPQPRQ	17	2086.0708
704	NSIRINQHSVFPL	13	1523.8209
705	KQVEEETRE	9	1146.5517
706	LEEVQIIKMEIELINLATM	19	2303.2593
707	SGGQVVAEKGRETETARG	18	1830.9184
708	SLVNNDDRD	9	1046.4629
709	EDVVVEVEDGVVL	13	1485.7675
710	VLVYPSQAT	9	1049.5506
711	ESVIVPISKKQIRE	14	1656.941
712	IKPPTDPQQRPQE	14	1692.8431
713	LISNASDALDKLRFL	15	1674.9305
714	HGGIATDDDYPY	12	1322.5415
715	VKELDGPIM	9	988.48993
716	KGVITQVKY	9	1034.6124
717	LAIPVNKPGRY	11	1226.7135
718	SKRPTFSNGY	10	1155.5673
719	SGDALRVPSGTTY	13	1322.6466
720	GVAPGPIW	8	795.42792
721	KEVGQDIQSKAQ	12	1329.6888
722	KAKDTTMVDVPVKVPY	16	1789.9648
723	AFPGSAQDVERL	12	1288.6412
724	FVVVVSGDQVVA	12	1307.563
725	NLHPGDAQRIPAG	13	1344.6898
726	SAEKAKERK	9	1045.588
727	RTDGEAALK	9	1016.5251
728	TVQDAADLIEEIVQ	14	1542.7777
729	TAQVIIMNHPGQIGNGY	17	1811.8989
730	SVIVEISKKQIRE	13	1527.8984
731	TPLFPRILG	9	1012.607
732	ATIVSIKARQIF	12	1345.8082
733	KPVNRIESEGGL	12	1313.6575
734	RLSDDLQKSNF	12	1434.7467
735	VINEGDANIELVGL	14	1454.7617
736	VRNDLENSLPKPY	13	1543.7995
737	HPEWELPDDAVVY	13	1555.6943
738	KSQVVKEKLGGQHRDAEL	18	2051.076
739	ETNSSINNPPSRQ	13	1442.675
740	LKVRENNPFY	12	1522.7416
741	AENNQRNFL	9	1104.5312
742	GSIPGVTSDHM	11	1099.4968
743	KFLVPPQESQKR	12	1455.8198
744	LQGENEGEDKGAIIVTVKGGL	20	2013.0378

745	RQEEHEQREEQEWPRK	17	2322.0737
746	RNSWDPPNPH	10	1218.553
747	WDIIPIVPILV	11	1293.7445
748	YEAGVVPPARF	11	1204.6241
749	VQGETVVPGGTGGKSLEAQQVL	22	2248.156
750	VKGGLSVIKPPTDEQQRPQEEEE	24	2720.3617
751	ETLIMSDESTESETEQAFL	19	2158.9464
752	LAFPGSAQDVERLL	14	1514.8093
753	FQNQDIFHDLAFTPL	15	1804.8784
754	RVETGVVKPGM	11	1171.6383
755	AGHPPWELPDDAGKY	15	1683.7529
756	LVSESETEKITLEPGDM	17	1876.8976
757	MTDEEFAREML	11	1370.5846
758	SFLPVPSLDKF	11	1248.6754
759	SEFEEINRVLF	11	1381.6878
760	VIIMNHPGQIGNGY	14	1511.7555
761	KEERKQEEDE	10	1318.6001
762	LINANGIETTFPLPSKY	17	1893.0248
763	AIDIGRNVIHGSD	13	1365.7001
764	IGENKDAMVGW	11	1234.5288
765	DTKFEEINKVLFG	13	1538.7981
766	VPGVEVANVERL	12	1280.7089
767	LKPDNRIESEGLL	13	1426.7416
768	LTLPDQEKVLW	11	1397.7667
769	HNQDIFHDL	9	1137.5203
770	TQGVAGLGHAPISLPNQL	18	1771.9581
771	VEVAPPQAGEVRL	13	1363.746
772	LNNAEQHLTNSVEEITQQQLERVY	25	2896.4315
773	AIPVNKPGPF	10	1097.6346
774	IKDYGQQQISGVQAS	15	1620.8107
775	FLREDGTLKPVAIEL	15	1699.9509
776	FLAPIDTKPQTH	12	1366.7245
777	SKARYDEIVKEVSSY	15	1772.8945
778	YEGGIKLVPDVIS	13	1445.7878
779	NQDIFHDLAFTPL	13	1529.7514
780	WANVDPTSTIRL	12	1347.6419
781	AAARDARDAKVE	12	1271.6582
782	ALKPDNRIESEGGF	14	1531.7631
783	HSKHDKSSPSYH	12	1408.6484
784	IETWNPNNKPFQ	12	1486.7205
785	AVGETVVEIGENMVK	15	1573.8022
786	LDLEPNKIVDFIKF	14	1721.924
787	NVINGGSHAGNKL	13	1279.6633
788	GVNTGGAHT	9	812.37768

789	KTNDTPMIGTLAGANSL	18	1815.94
790	EDLPIPTAY	9	1076.5502
791	EHLEPNLEPL	10	1149.5666
792	GLVRESETEKITLEPGDM	18	2002.9881
793	LVDLNGNHL	9	993.52434
794	VTETKVPGR	10	1141.6568
795	ITPLKPSAPKIPLEVL	16	1715.0597
796	SVDLPGLKKEDVKVEVEDGRVL	22	2423.3272
797	KTSLPEWVRIGF	12	1431.7874
798	SPHWNLNANSVIY	13	1513.7314
799	SEFEEINRVLL	11	1347.7034
800	EDLKVQVPPNKILQ	14	1683.9043
801	KDISEGPPAIKL	12	1266.7184
802	VDAQPQQKEEGSK	13	1442.7001
803	SAGEKVKKPF	10	1089.6182
804	TIIPLPVIKEL	11	1234.7901
805	SITDSQIPLTGPNSSIIGRA	19	1939.0375
806	IAKNLQGENEGEDKGAIVTVK	21	2212.1699
807	QEQGGHQSQKGKHQQEEENEGGSIL	25	2761.2652
808	SPDIYNPQAGSVTTA	15	1519.7155
809	HRNPEEIPWGSGAD	15	1664.7543
810	LPEEVIQHTF	10	1211.6186
811	RKKGVITQVKY	11	1318.8085
812	LVPPQESQRR	10	1208.6626
813	NSNKINAYPSVDL	13	1433.7151
814	SPNELDKGIGLVF	13	1387.7347
815	SSAIDNAHIDQWIDF	15	1730.79
816	AEKLRSPPDERK	12	1442.7478
817	ITSKLPTLISL	11	1184.738
818	SSRVIDLLVF	10	1147.6601
819	RVFDGELQEGVL	13	1417.7201
820	DMTIGGQPAGRIVME	15	1573.7592
821	DEEQDKESQSEGESQREPRR	22	2634.139
822	NIPTKINIGTVEIITPVEL	19	2078.1987
823	ETNTSINNPPSRQ	13	1456.6906
824	NVLDFNSVADLTGKNGVGL	19	1931.9953
825	ITLAIPVKNKPGVF	13	1424.8504
826	ELDKGIGTIISSPY	14	1491.7821
827	IVNRDENDKLF	11	1361.6939
828	TTVPPHPVQVHT	12	1301.6728
829	KSVSQNVLP	11	1196.7129
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832	LEHNRSPGYY	10	1277.5901

833	SQLLDKAKNF	10	1162.6346
834	SSIEGAKEPY	10	1138.5619
835	VPPQESQRR	9	1095.5785
836	GAWETAKDTTQKIKE	15	1704.8683
837	HTNPTKPINL	10	1133.6193
838	EKLFDQQNEGSIF	13	1553.7362
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840	NALKPDNRIESEGGFI	16	1758.8901
841	SDDINKQHDTTNAY	14	1620.7016
842	DLVGQDITAAAM	12	1241.571
843	VGDADDITSSLAHA	14	1370.6314
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846	SWNKFVPKQPNM	12	1474.7391
847	AVKVNIPSSLDN	12	1231.6044
848	PGSAKDIE NL	10	1042.5295
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851	VVEEIFSKELDGPIMF	16	1851.9328
852	GAKKVII SAPSKDAPMF	17	1758.9702
853	GNKLKEIEELL	11	1299.7398
854	NIPQTSSPPIYNPQAGSVTTA	21	2120.0022
855	SVDKQIAKNLQGENE	15	1671.8428
856	AAARDAKVEARDVKRT	16	1755.9704
857	IRINQHSVFPL	11	1322.7459
858	KAETKEGGGEEKGMRR	16	1761.8792
859	LKDPNSPSRSND	12	1403.6389
860	SGGIPLPTDIISK	13	1327.7711
861	LQKIMDNQSEQLEGKEKKQMERELM	25	3062.5199
862	KALVTDADNVIPKA VDA	17	1738.9465
863	TSFHSEFEEINRVLF	15	1853.8948
864	NIGQTSSPDIFNPQAGSITTA	21	2118.0229
865	VDAQPQQKEEGN	12	1341.6161
866	ATITAQKSKLY	11	1226.5779
867	VVLPVQNDGSTGLH	14	1434.7467
868	NLQGENEGEDKGAIVTVKGGL	21	2127.0808
869	VAPADAHPK	9	1191.6221
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871	LEATKPTLPFPWLPETD	17	1954.0088
872	VVQSRNELDKGIGTIIS	17	1828.0054
873	AWMTDEEFAREML	13	1627.7011
874	IVTVKGGLRVTA	12	1212.7554
875	FVDAQPQQKEEGN	13	1488.6845
876	GVIEGKMMELL	11	1263.5951

877	VVSKNKPLVVQ	11	1209.7445
878	GKVKIGINGF	10	1031.6128
879	VELDGPIMF	9	1048.5263
880	DEEGVVNVERRKK	13	1556.8271
881	NVAGIAHRAY	10	1070.5621
882	AHVDWRETDKAHIF	14	1723.8431
883	AVDAQHEAVILPSA	14	1419.7358
884	TNSLENQLDQMPRR	14	1700.8264
885	PVQNLGSTGLHW	12	1309.6051
886	SPQLENLIDY	10	1233.599
887	TNRFEQAKQF	10	1267.6309
888	VGDAAQKTKE	10	1045.5404
889	TTQVPPHSVPVHT	13	1429.7314
890	AGEKPNVVRQIE	12	1356.6997
891	RPIPFPRPQPRQ	12	1487.8473
892	DVRDLHEGGIKL	12	1350.7256
893	ITPEKNPQLRDLDF	15	1797.9625
894	SGIIHKIEETLHVG	14	1531.8358
895	SSIRINQHSVFPPN	14	1594.8216
896	VPPQESQKRA	10	1138.6095
897	VVSVNPPLVVQFQ	13	1484.8715
898	QVLHPNGGTVVNG	13	1290.668
899	AQQLPKQAQVKSVPF	16	1738.973
900	EEEKGAIIVTVKGGL	14	1428.7824
901	FLREDGTLKPVAIE	14	1586.8668
902	LVQLNREKDRDF	12	1561.7849
903	RKENEQSSLKDISKY	15	1823.9377
904	EKLQSPDDERK	11	1343.6681
905	HAPISLPNQLASHF	14	1530.7943
906	REEIGEENKQSSL	13	1517.7322
907	DAADLIEEIVQ	11	1214.603
908	SAIDNAHIDQWIDF	14	1643.758
909	FPGSAQDVERLLK	13	1458.7831
910	IIDTNSLENQLDQ	13	1501.726
911	RNSWPPPNPHIGIN	14	1615.7855
912	EQPRPIPFRPQPRQ	15	1842.0013
913	AAHAITATGDLVSL	13	1237.6667
914	RINIGQNPSPIYNPQAPIIT	21	2259.088
915	ANKIQDKVTIDG	12	1300.6987
916	VGSVEVGKLADLMW	15	1601.8487
917	FPRPEEHEGEQW	12	1539.6743
918	IEEVWDRNPLLSPDPY	17	2055.9902
919	KIMENQSEEL	10	1219.5755
920	TGLGELGQVVL	11	1100.5714

921	TSLPEWVRIGF	11	1303.6925
922	EYVVIPTPPHQ	12	1407.7034
923	RLERSDDEF	10	1264.6048
924	TIIPLPVIKE	10	1121.706
925	KEERKQEEDEDEEQRESEESD	23	2909.1919
926	VVNPDNNENLRLITL	15	1722.9264
927	KDIGADWDILY	11	1309.5826
928	SGIIHKIEETLH	12	1375.746
929	SFHSEFEEINRVLF	14	1752.8471
930	GGESKPQFNIF	11	1222.5982
931	GSKDNVIRQ	9	1015.5411
932	RFEEMNMDLF	10	1330.5686
933	LKPDNRIESEGGF	13	1460.726
934	NSLTLPALRQF	11	1258.7034
935	IDLSVIEILSRH	12	1393.7929
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937	SLKVREDENNPFY	13	1609.7736
938	AQKPKPSEGNPQKEGTGSIVF	21	2198.1331
939	GEITAIIDIKEGQKELPY	17	1902.9939
940	IYPAVDPLPSTSRM	14	1563.7603
941	REGDLIAVPTGVAW	14	1482.7831
942	NPWWAISKDISEGPPAIKL	19	2121.1259
943	INLVKPDDRDY	12	1443.7358
944	LKNDGTLIPL	10	1125.6506
945	VVSKNKPLVVQF	12	1356.8129
946	ALKPDNRIESEGLIE	16	1739.9054
947	LDVKPWDETDMMKLEEAVRS	21	2503.2265
948	SPLEGGKIADSQPVDL	16	1624.8308
949	IYDELAERR	10	1278.6204
950	RYPSPQSQGW	11	1367.6258
951	VNPKDHKNPVQ	11	1274.6731
952	GHPEWPLDPAGKY	14	1612.7158
953	NFREGDLIAVPTGVAW	16	1743.8944
954	GSSTHPYPRR	10	1156.5738
955	GGLSVIKPPTDEQQRPQEEEE	22	2493.1983
956	SATGATEAAHA	11	997.48287
957	FFEITPEKNPQLRDLDF	18	2221.1419
958	SPNELDKGIGL	11	1141.5979
959	LPVQNDGSTGLHW	13	1422.6892
960	GNIGVLTGDEGEIRL	15	1541.8049
961	IIDTNSLENQLDQMPRRF	18	2189.0899
962	HMKEGSSIINT	11	1215.5918
963	ITGDHGVTVTETTF	14	1476.7096
964	IDIGVPDEVGRL	12	1281.6929

965	SYDTKFEEINKVLF	14	1731.872
966	EDQPRPDHPPQRPSRPEQQEPRG	23	2732.3127
967	ALEPDHRVESEGGL	14	1507.7267
968	EATKPTLPFPWLPETDM	17	1971.9652
969	GAIDKAI IAIL	11	1098.6285
970	II IQHNDGKKF	11	1311.7299
971	VAEDELMIIL	10	1187.622
972	ALRVPSGTTY	10	1063.5662
973	IWIQRNTGNL	10	1213.6568
974	KIQAGRREGDGSDED	15	1631.7499
975	ATVNVAKPKPNNTVAVF	17	1768.9836
976	DVIGDPIRNGF	11	1203.552
977	GSQDNVISQIPSQ	13	1371.663
978	GSKDNVISQIPSQVQEL	17	1840.9531
979	NIGQTSSPDIFNPQAGSIT	19	1945.9381
980	NKLPEIEEKLARK	13	1597.9515
981	TGLGELGEVVL	11	1101.5554
982	DEDVDKPRPSRPSQGKRE	18	2125.0148
983	FVDAQPQQKEEGSKGRK	17	1930.9861
984	REGDLIAVPTGVAVW	15	1668.8624
985	IVDKEINGPEDL	12	1340.6824
986	TAANIGASAK	10	902.48214
987	ELISNASDALDKLRF	15	1690.889
988	AGIAAQKTVLY	11	1166.5568
989	EAVGQTPLFPVIF	13	1502.8245
990	NRGGGHKIKGTVVL	14	1434.8419
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992	LPSYSPYPPM	10	1181.5427
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994	TSFHSEFEEINRVL	14	1706.8264
995	TEGAELIDSVL	11	1145.5816
996	AGKDEDKPD L	10	1117.5251
997	FPGSAQAVEKLLK	13	1386.7871
998	SVVEDLPEGPAVKIGE	16	1637.8512
999	YLVNPHDHQNL	11	1348.6524
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1005	GLDFTKDDENVNSIPF	16	1824.8166
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1008	NALKPDNRIESEGG LIE	17	1853.9483

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1011	SQQQLQDSHQKIRHF	15	1878.9449
1012	LDHHDPIMPY	10	1236.5597
1013	EWERIYDYDVY	11	1549.6725
1014	AAQKAKETVLY	11	1251.6459
1015	APIDTKPQTHAGY	13	1397.6939
1016	LEVIARPSRADF	12	1411.6957
1017	RVPTVDVSVVDL	12	1297.7242
1018	EITPEKNPQL	10	1167.6136
1019	ASITAQTSVLY	11	1185.515
1020	GNPDIEHPETM	11	1238.5238
1021	LSVVDMNEGALF	12	1293.6275
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1024	IMDNQSEQLEGKEKKQMERELM	22	2693.2823
1025	AAVSQVVLPAKEGVESTIW	19	1983.0677
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1028	YIVTPPKPGPDSEL	14	1579.7253
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1034	APINKIHPHL	10	1169.6669
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1044	AAARDAKVEARDVKRTTVT	19	2057.1341
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1048	VAIKLPSAPHGL	12	1203.6612
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1060	FDQDDNGI IYPWETY	15	1874.7999
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1070	IVVVWNPRNPLL	12	1496.7623
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1072	NKRSPQLENL	10	1197.6466
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1086	LNLPSEIVPATL	12	1265.7231
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1088	PSVDLVMDKPN GPVW	15	1652.8232
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1091	LTVGVDNEPIFHGRT	15	1653.8475
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1095	MTDEEFAREM	10	1257.5006
1096	LREDGTLKPVAIE	13	1439.7984

1097	AFPGSAQDVERLL	13	1401.7252
1098	KLQGENEEEEKGAIVTVKGG	21	2227.1696
1099	ILLPHHADADFL	12	1360.7139
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1103	NIGQNSSPDIYNPQA	15	1616.7431
1104	LPTLGAGESAF	11	1061.5393
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1107	GEEVKVVVPESVL	13	1382.7657
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1114	HFIVPELGPDVNF	13	1482.7507
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1118	SGAVSQVILPAKEGVESTIW	20	2070.0997
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1122	KSSIRPDIVNF	11	1274.6983
1123	NTKFEEINRVL	11	1361.7303
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1127	IAKNSWGEDWGEDGY	15	1725.7271
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1131	QIAKNLQGENEGEDKGAIVTVK	22	2340.2285
1132	VEDLPEGPAVKIGENKDAMDGW	22	2369.1209
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1134	LTDKARDVKERA	12	1400.7736
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1136	AIKEESEGLK	11	1230.682
1137	DQALPADLIKR	11	1238.6983
1138	EKGSEEEDEDE	11	1294.4685
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1144	GPIGRDPESVL	11	1082.5356
1145	VWFPQPAPKHPW	13	1603.7936
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1147	YVVNPDNNENLRLITL	16	1885.9898
1148	IGKDPTPQTAIDNL	14	1513.7624
1149	FFEITPEKNPQLRD	14	1732.8784
1150	NVLDVNSVTSVGGIIGQGL	19	1840.9894
1151	HSVQIKDYVPKY	12	1491.7358
1152	KPNLEADHIPTWL	13	1532.7987
1153	LEATKPTLPFPWL	13	1511.8388
1154	TFEDPTTSPVAPATL	15	1577.7461
1155	AILPQPISVSIDAIDF	16	1744.9247
1156	AKVINDRFGIVEGLM	15	1660.8971
1157	EATKPTLPFPWLPETD	16	1840.9247
1158	EEPQQKGQSSRPQDRHQKIY	20	2438.2051
1159	DKESQESEGSESQREPRR	18	2132.9683
1160	SGEERAQEEGIGIDESKF	18	1979.9072
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1162	GAKDTIGSVDHITTPL	16	1623.8468
1163	IGQVSSPDIYNPQAGSVT	18	1833.8745
1164	VDAQPKKKEE	10	1170.6245
1165	VAILEQPISVSIDAKDF	17	1831.9567
1166	SAKDAAGTVADKSRE	15	1504.7481
1167	LIETWNPNNKPFQ	13	1599.8045
1168	VTIASNKENLL	11	1200.6714
1169	TSIGEKLGDAKQREEL	16	1772.9268
1170	NFREGDLIAVPT	12	1330.6881
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1172	EEEEDEEEEEPDGRGVIPEVVTN	22	2571.0984
1173	TAISLDFPALW	11	1220.6077
1174	FPPFRPPHQVVVRKQVDED	20	2537.1935
1175	IVQTSSPDIYNPQAGSVTTA	20	2005.9593
1176	ANDAAHKSXDY	11	1218.5629
1177	VVGVNEHEYKPEL	13	1511.762
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1179	ATDASATVPIPDVM	14	1386.6701
1180	IGENKDAMDGWF	12	1381.5973
1181	SGIIHKIEETL	11	1238.6871
1182	ELPDGQVITIGAERF	15	1643.8519
1183	DMKLRDDLRL	11	1402.7238
1184	EEQDKESQESEGSESQREPRR	21	2519.112

1185	NDVYLPRDEAF	11	1337.6252
1186	VSPRHFDFSEVVF	12	1417.699
1187	VNPDKKKDLLV	11	1310.767
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1191	VYVPRDENFGHL	12	1444.7099
1192	VTETKVPGRRIITE	14	1597.9152
1193	LGDPDKGENHARPVL	15	1616.8271
1194	LHEGGIKLPTEVIS	14	1491.8297
1195	TIIPLPVIKELY	12	1397.8534
1196	SVISPKWQEQQD	12	1443.6994
1197	VMDKPNGPVWRISGEDLM	18	2042.9918
1198	SKEEIEKMKDAERY	15	1853.9193
1199	VINDRFGIVEGL	12	1330.7245
1200	RSQRPQDRHQKVHRF	15	1974.0521
1201	AKPEASVTDVDF	12	1277.6139
1202	LEATKPTLPFPWLPET	16	1838.9818
1203	IRVNGVAPGPVW	12	1263.7088
1204	PFPRPRQPHQEEEHE	15	1911.8976
1205	VISTIPLPVIK	12	1291.8479
1206	HGGPYPLSEPDIIVL	16	1678.8203
1207	GIRNPEEIPWGEVGADY	17	1900.8955
1208	ITGQVLHPNGGTVVNG	16	1561.8213
1209	TTQVPPPSVQVH	12	1328.6837
1210	ASGEKKKIVGVF	12	1261.7394
1211	EEQQRESESESELRR	17	2134.9363
1212	NVISQIPSQVQEL	13	1453.7777
1213	SLVNDGGVIEQTF	13	1377.6776
1214	VQSPNELDKGIGL	13	1368.7249
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1216	DVRDLHEGGIKLPTEVI	17	1890.0211
1217	AFPGSAQAVEKLLK	14	1457.8242
1218	GISIDHDDGTRR	12	1340.6433
1219	LDKGIGTIISPY	13	1362.7395
1220	DMTIGGQSAGRIVMELY	17	1839.8859
1221	LAVSGKPNTQGF	12	1238.5527
1222	ETGVVKPGMVVTF	13	1362.7217
1223	TLAIPVPKPGRF	12	1311.7663
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1226	SRNELDKGIGTIIS	14	1501.81
1227	LTNPIIQQTGLGELGQDVL	19	1969.9956
1228	QDVRLLHEGGIKLPTEVI	18	2018.0797

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1235	FDMTIGGQPAGRIVMELY	18	1996.9751
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1253	GVNPEGKVPVVLFF	13	1353.7656
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1255	VINDRFGIVEGLM	13	1461.765
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1257	LDNVTGNITPGGPEVL	16	1586.7788
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1259	TVTVPKEEDKKPQVK	15	1724.9672
1260	DNQSEQLEGKVKKQMERELM	20	2449.1577
1261	GTIAAEDILHDIGA	14	1394.7042
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1263	VMDKPNGPVWRISGED	16	1798.8672
1264	ASQVAKETKDATM	13	1407.7028
1265	VMIHDSQTRF	10	1232.5972
1266	DVQVYPEKGTVAF	13	1451.7296
1267	LGVNPEGKVPVVLFF	14	1466.8497
1268	PDLDDAQLAKEVEYL	15	1717.841
1269	QEEDEDEEQRESESESELRR	23	2880.1765
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1271	DLPEGPAVKIGVNKDAMDGW	20	2141.0099
1272	TKPTLPFPWLPETD	14	1640.845

1273	NGLHLPSYSPYPQM	14	1602.7501
1274	RLQVSVIVEISKEQIRAL	18	2110.211
1275	AARDAKVEARDVKR	14	1583.8856
1276	KPTLPFPWLPETDM	14	1670.8378
1277	DVWFPQPAPKDHPW	14	1718.8205
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1279	EKGSEEEDEDEDEEQD	16	1910.6661
1280	IKLPTDILSKISPLPVLK	18	1974.2493
1281	DTEGRYPANIENI	14	1589.7686
1282	LPPFPPKSNLDPAIY	15	1731.872
1283	KHMVEGSSIINTTSVNAY	18	1978.9782
1284	VVQSPNELDKGIGLVF	16	1713.9301
1285	VSLPGVLPVASGGIHW	17	1686.9457
1286	MPVVELEVNPDSAVDNL	18	1940.915
1287	SLINANGI IETTFLPS	16	1688.8985
1288	NSWDPPNPHIGINVN	15	1672.7958
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1290	TKPTLPFPWLPETDM	15	1771.8855
1291	NGVAPGPVWTPIQPASKPAEM	21	2146.0881
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1294	TFAVVDNIVSSLDNVAKE	18	1906.9636
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1301	NDRPSIGNLAGANSLL	16	1610.8376
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1303	DKIRLGDTVLF	11	1291.6772
1304	TVVQSPNELDKGIGLVF	17	1814.9778
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1307	VEQLEGKEKKQMERELM	17	2092.0293
1308	HTAVDLVNETKLDDEIKSW	19	2212.1012
1309	EEVKVPVEPGRVLQ	14	1627.8417
1310	APGPVWTPIQPASKPAEM	18	1875.9553
1311	LVVEDIDATDSGGPMVPW	18	1899.8924
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1317	KPFDELFVDF	10	1255.6125
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1320	LPRDVISTIIPLPVIKELY	19	2178.3028
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1329	KEPGSSAGELVVIALAHAF	19	1895.0153
1330	TLIMSDESESETEQAFL	18	2029.9038
1331	RAAETAEEAAKNKTAETA E	18	1860.9177
1332	KQQGGTQSQKGKRQQEEENEGGSIL	25	2743.3485
1333	DGTGERKEWERIYDYDVY	18	2293.0287
1334	FAEEDKKVKERIDARNSLET	20	2377.2238
1335	QVEDRAVAAAKVAAKVLVQL	20	2197.1703
1336	GATVNVAKPKPNNTVAVF	18	1826.005
1337	FNTNEDTAEKLRSPDDERK	19	2264.0669
1338	RTGRKPTRKDPNSESRSND	19	2200.1057
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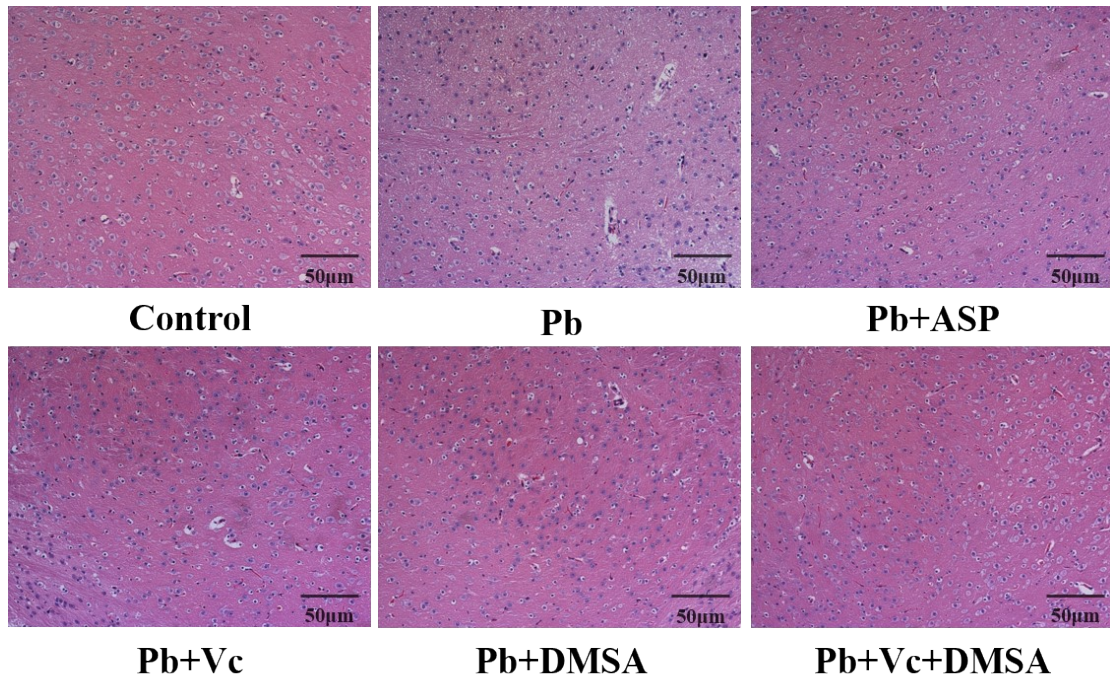
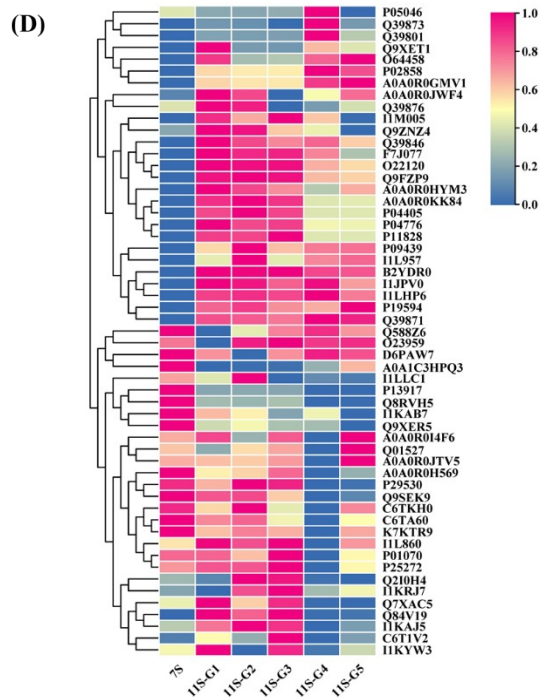
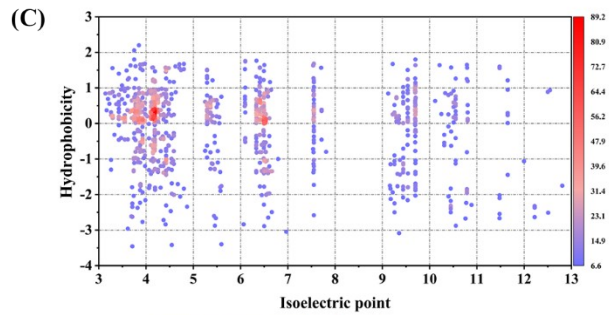
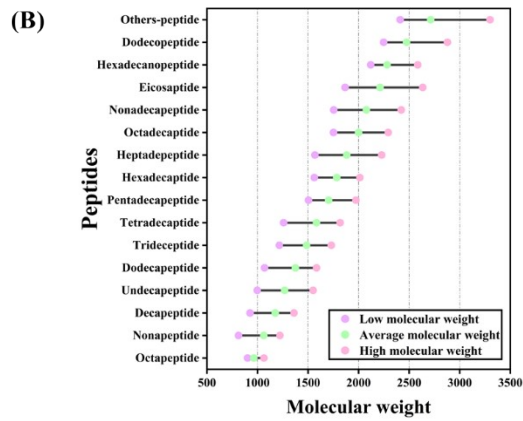
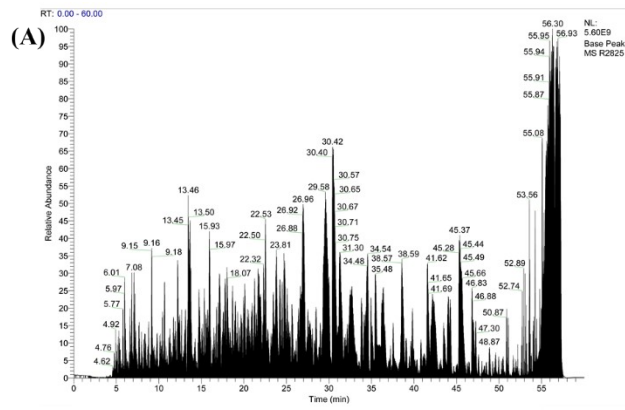


Figure S1 HE stain of brain sections observed with a magnification of 250×.



33 **Figure S2 Peptides characteristics of ASP.** (A) Total ion chromatogram, (B)
34 molecular weight distribution and (C) hydrophobicity and isoelectric points of ASP.
35 (D) Sequence alignment between the precursor protein (7S, 11S-G1, 11S-G2, 11S-
36 G3, 11S-G4 and 11S-G5) for enzymatic hydrolysis simulation and the parental
37 proteins of peptides in ASP.

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