Electronic Supporting Information for:

Self-assembling covalent organic frameworks functionalized magnetic graphene hydrophilic biocomposite as an ultrasensitive matrix for N-linked glycopeptide recognition

Jiaxi Wang,[a] Jie Li,[b] Mingxia Gao,*[a] and Xiangmin Zhang [a]

[a]Department of Chemistry and Institutes of Biomedical Sciences, Fudan University, Shanghai 200433, China.

[b]Shanghai Key Laboratory of Molecular Catalysis and Innovative Materials, Department of Chemistry, Fudan University, Shanghai, 200433, China.

Corresponding author

E-mail address: mxgao@fudan.edu.cn

EXPERIMENTAL SECTION

Nano-Liquid chromatography tandem mass spectrometry (Nano-LC−MS/MS) analysis of glycopeptides. Glycopeptides enriched from human serum were resuspended with 10 μL solvent A (A: water with 0.1% formic acid; B: ACN with 0.1% formic acid) and then separated by nanoLC and analyzed by on-line electrospray tandem mass spectrometry. The experiments were performed on an EASY-nLC 1000 system (Thermo Fisher Scientific, Waltham, MA) connected to an Orbitrap Fusion mass spectrometer (Thermo Fisher Scientific, San Jose, CA) equipped with an online nano-electrospray ion source. 8 μL peptide sample was loaded onto the trap column (Thermo Scientific Acclaim PepMap C18, 100μm x 2cm), with a flow of 10μL/min for 3 min and subsequently separated on the analytical column (Acclaim PepMap C18, 75μm x 25cm) with a linear gradient, from 2% B to 25% B in 105 min. The column was re-equilibrated at initial conditions for 15 min. The column flow rate was maintained at 300 nL/min and column temperature was maintained at 40 °C. The electrospray voltage of 2.0 kV versus the inlet of the mass spectrometer was used. The Orbitrap Fusion mass spectrometer was operated in the data-dependent mode to switch automatically between MS and MS/MS acquisition. Survey full-scan MS spectra (m/z 350-1500) were acquired in Orbitrap with a mass resolution of 120 000 at m/z 200. The AGC taget was set to 1 000 000, and the maximum injection time was 50ms. MS/MS acquisition was performed in Orbitrap with 3 s cycle time, the resolution was 15 000 at m/z 200. The intensity threshold was 50 000, and the maximum injection time was 100 ms. The AGC target was set to 200 000, and the isolation window was 2 m/z. Ions with charge states 2+, 3+, and 4+ were sequentially fragmented by higher energy collisional dissociation (HCD) with a normalized collision energy (NCE) of 35%, fixed first mass was set at 110. In all cases, one microscan was recorded using dynamic exclusion of 30 seconds.

Database search. Tandem mass spectra were extracted by Proteome Discoverer software (Thermo Fisher Scientific, version 1.4.0.288). Charge state deconvolution and deisotoping were not performed. All MS/MS samples were analyzed using Mascot (Matrix Science, London, UK; version 2.3.2). The database was the Human UniProtKB/Swiss-Prot database (Release 2015-03-11, with 20199 sequences). Raw files generated by the Orbitrap Fusion were searched directly using a 10ppm precursor mass tolerance and a 50 mmu fragment mass tolerance. The enzyme specificity with trypsin was used. Up to two missed cleavages were allowed and peptides with at least 7 amino acids were retained. Carbamidomethyl on cysteine was set as a fixed modification. Oxidation on methionine and Deamidation on asparagine were set as variable modifications. Use the percolator algorithm to control peptide level false discovery rates (FDR) lower than 1%. The Asn modification that did not occur in the N-X-S/T (X≠P) sequon was eliminated to ensure the false positive rate below 1% for the identified glycosylation sites.

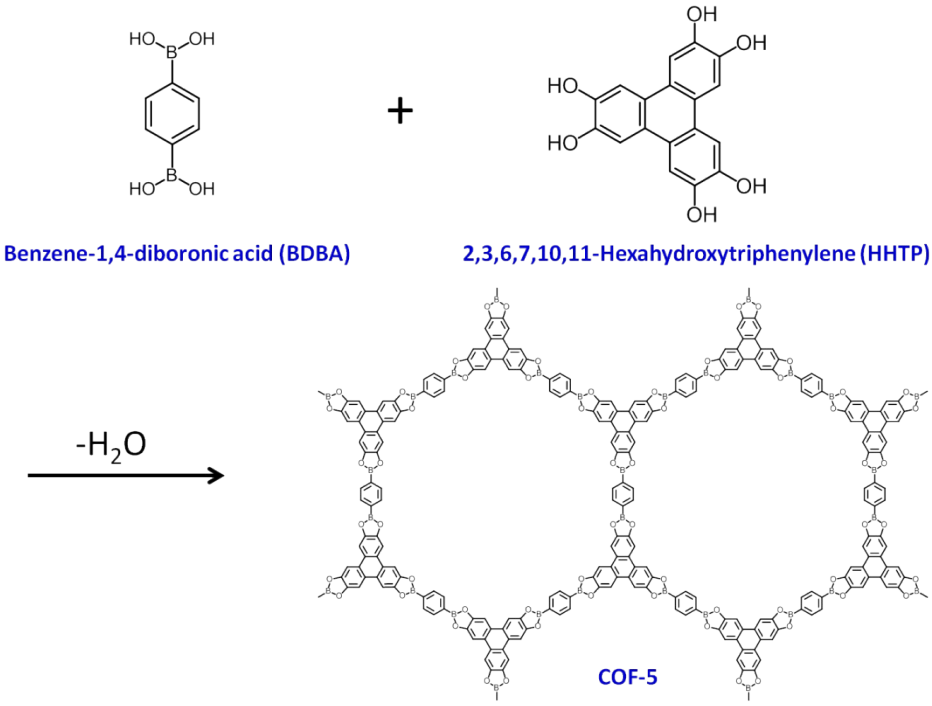

Fig. S1 Schematic representation for the direct construction of COF-5.

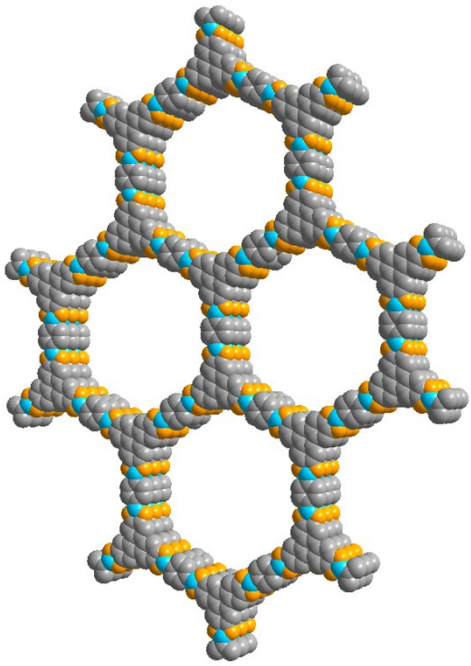

Fig. S2 The extended structures based on the eclipsed arrangements. C, gray; O, orange; B, blue. H atoms are omitted for clarity.

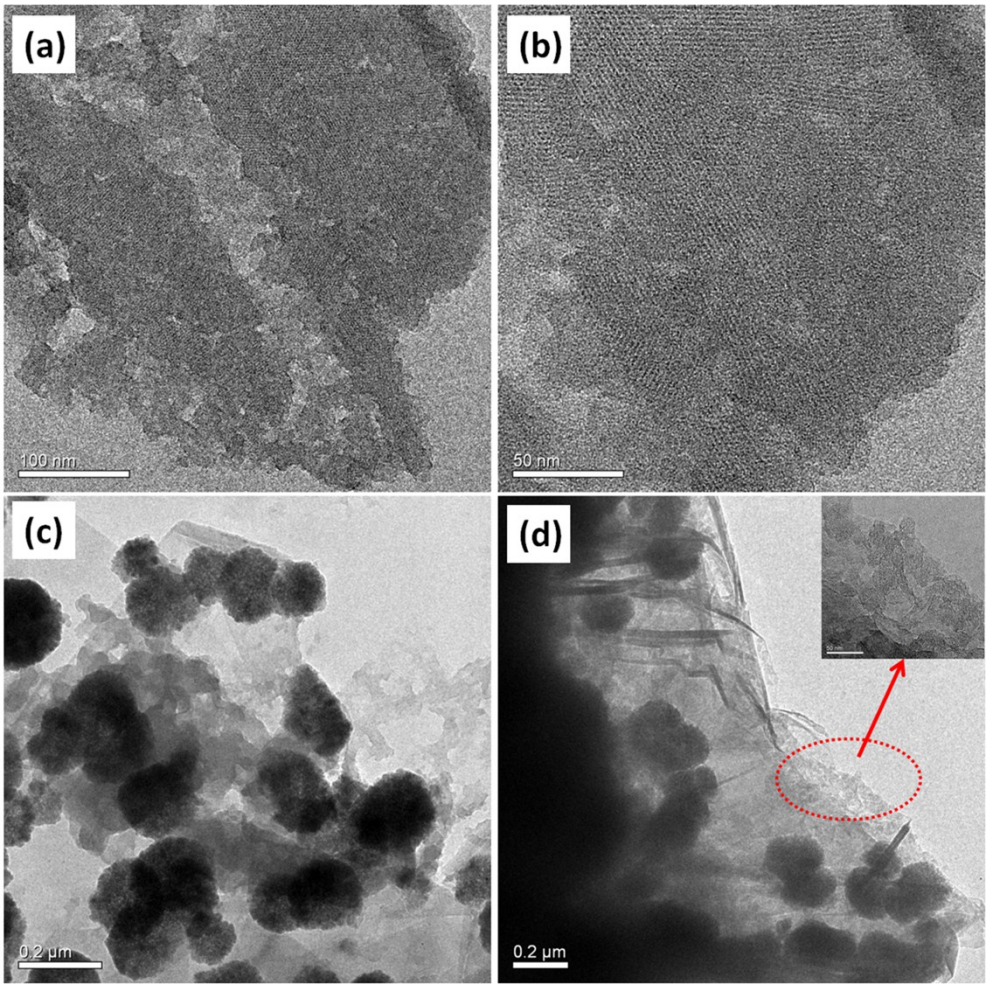

Fig. S3 The TEM images of (a, b) COF-5 materials, (c) MagG@COF-5-0.5C and (d) MagG@COF-5 biocomposite.

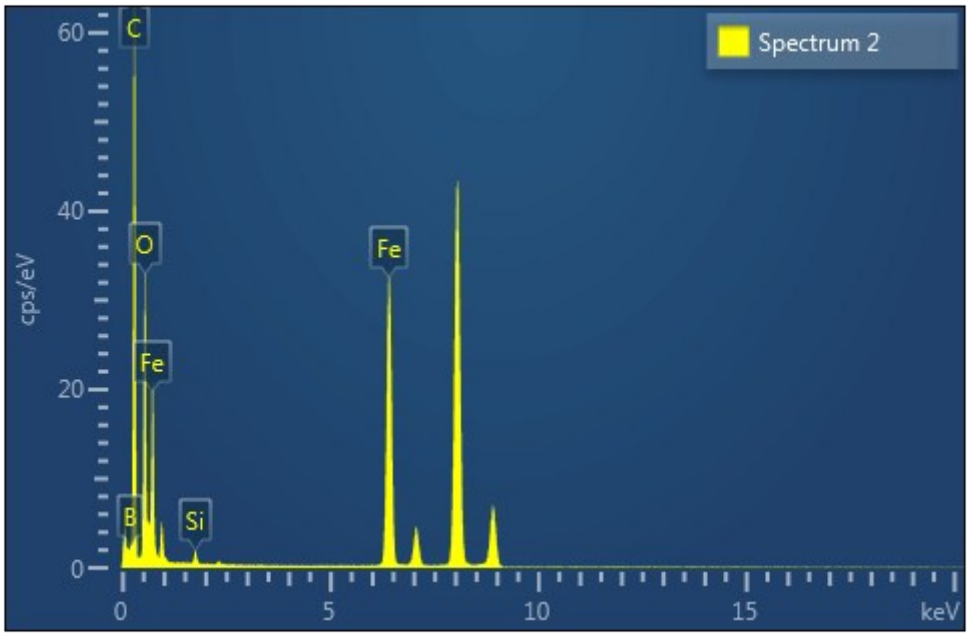

Fig. S4 The energy dispersive X-ray (EDX) spectrum data of MagG@COF-5 biocomposite.

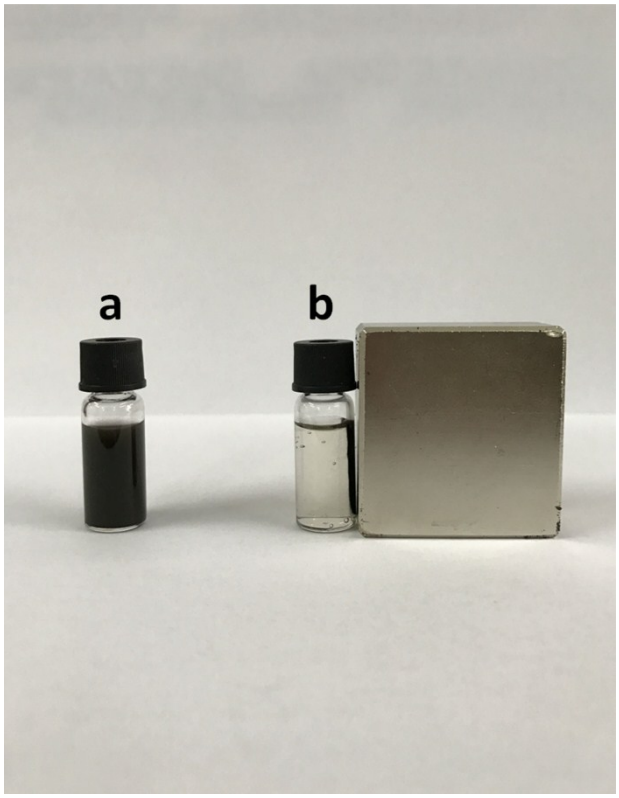

Fig. S5 The photos of the aqueous dispersion of MagG@COF-5 biocomposite: (a) before and (b) after separation by a magnet for 5 seconds.

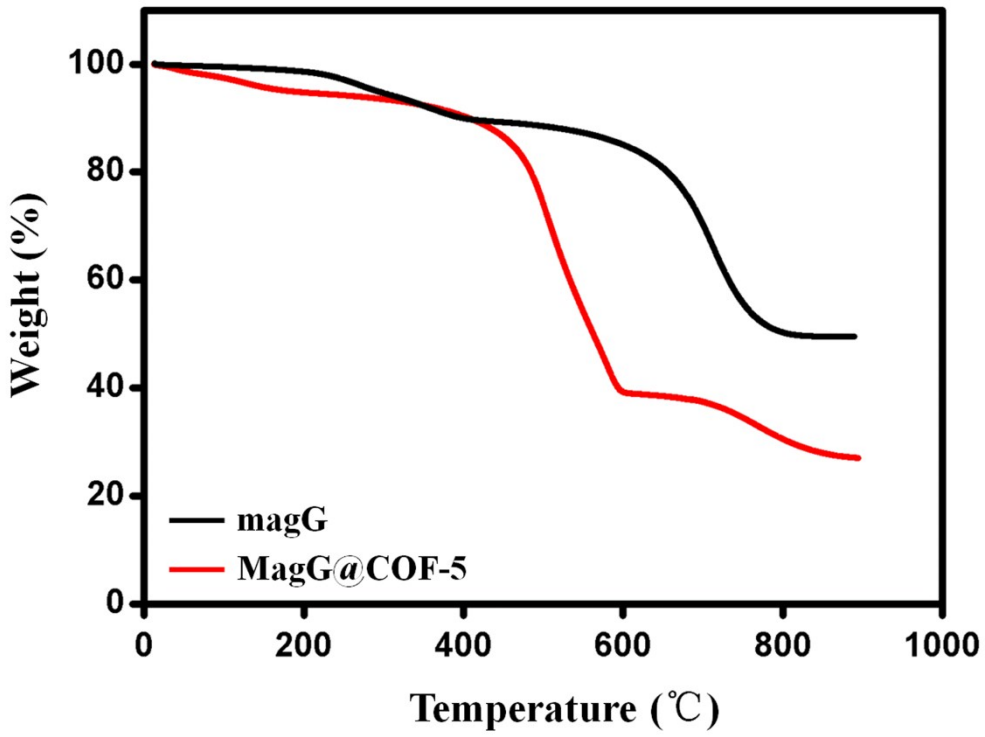

Fig. S6 TGA curves of magG and MagG@COF-5 biocomposite.

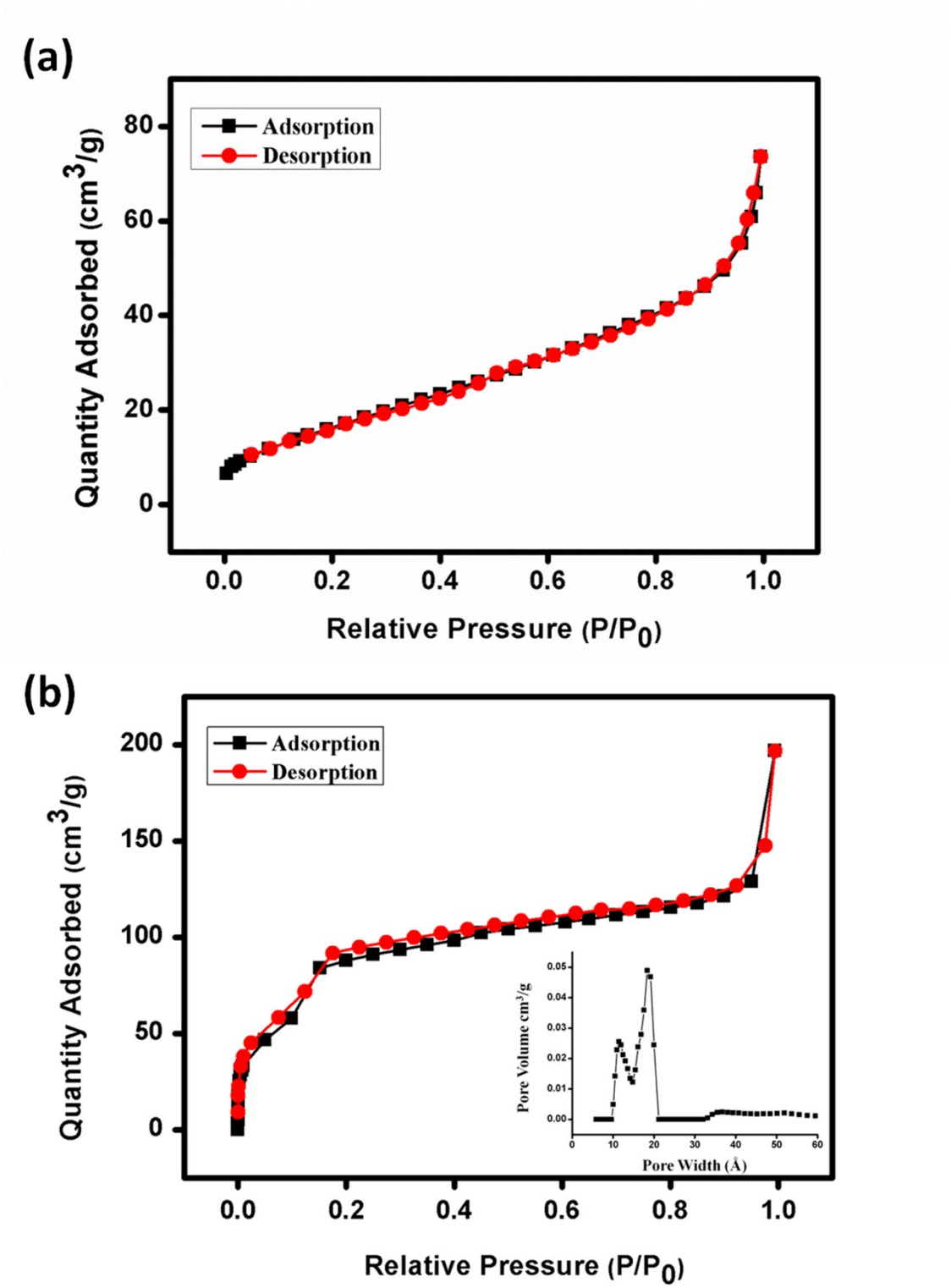

Fig. S7 N_2 adsorption/desorption isotherms of (a) magG and (b) MagG@COF-5 biocomposite.

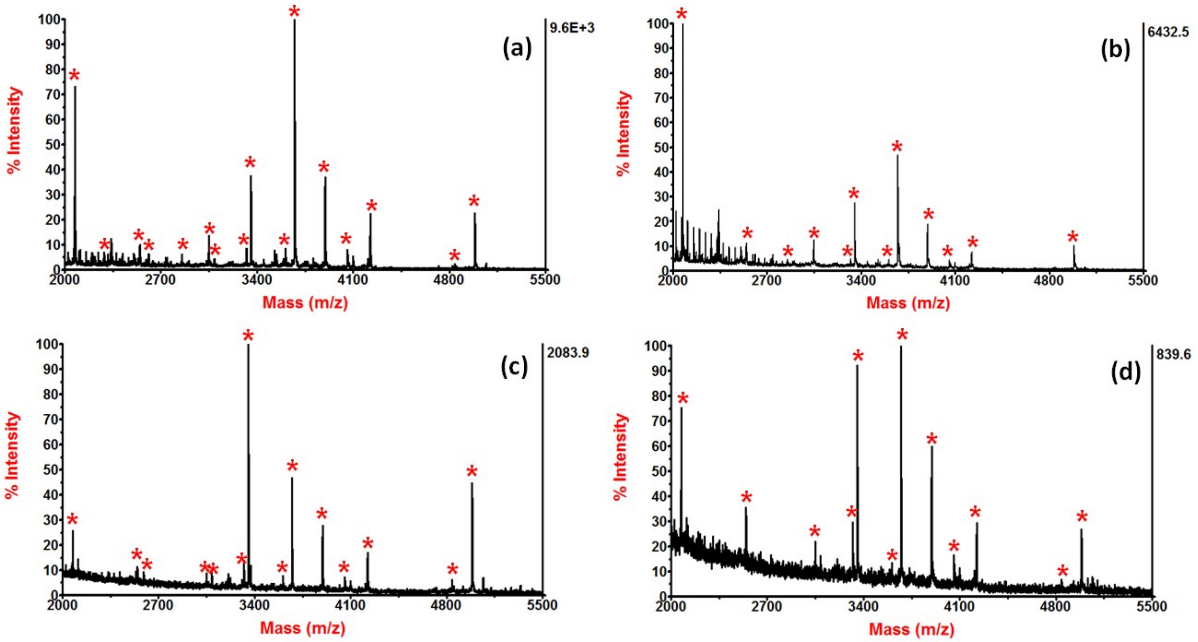

Fig. S8 MALDI-TOF-MS analysis of peptides derived from HRP enriched by MagG@COF-5 biocomposite with different buffer solution (a) ACN/H_2O/TFA (95:4:1, v/v/v); (b) ACN/H_2O/TFA (95:4.9:0.1, v/v/v); (c) ACN/H_2O/TFA (85:14:1, v/v/v) and (d) ACN/H_2O/TFA (85:14.9:0.1, v/v/v).

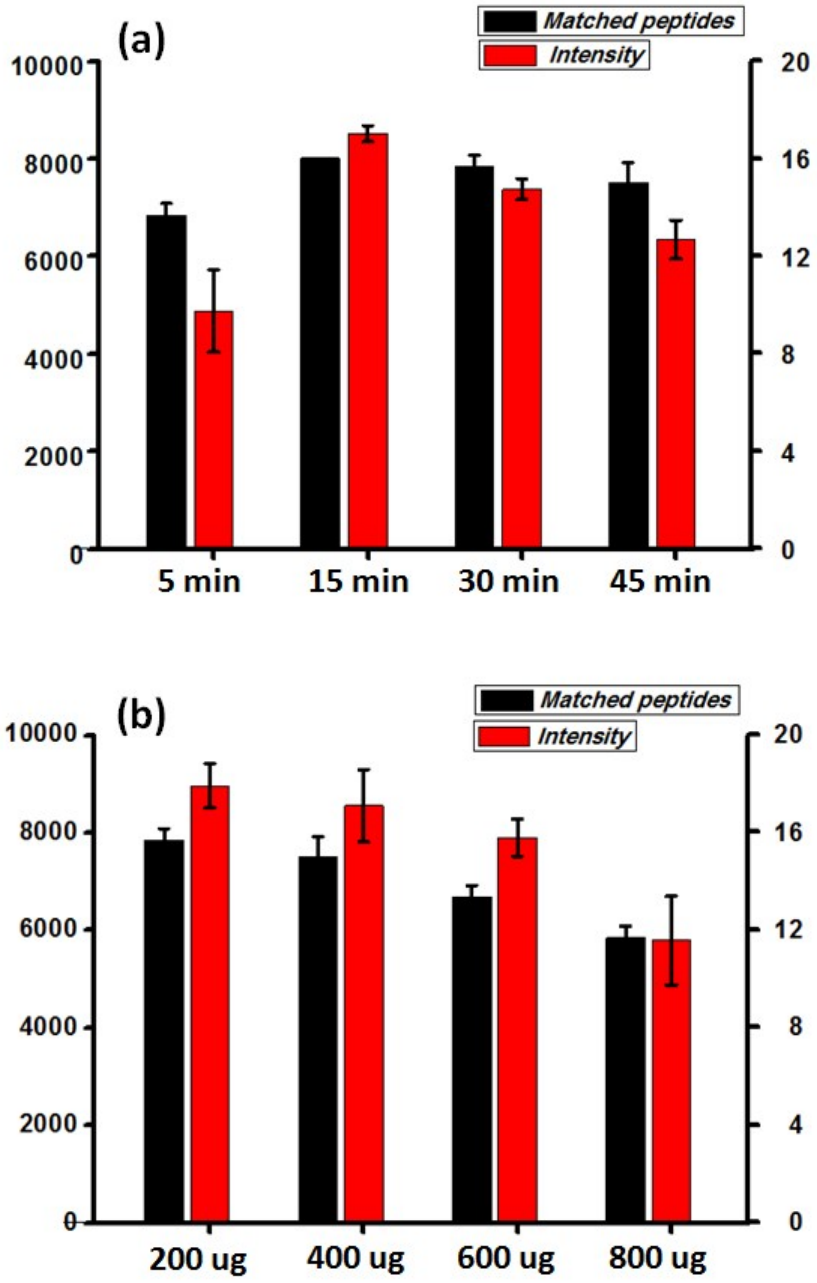

Fig. S9 The effect of enrichment time and different quantity of the MagG@COF-5 biocomposite in glycopeptides enriched from 10^{-6} M HRP tryptic digest (a, b) through three parallel tests.

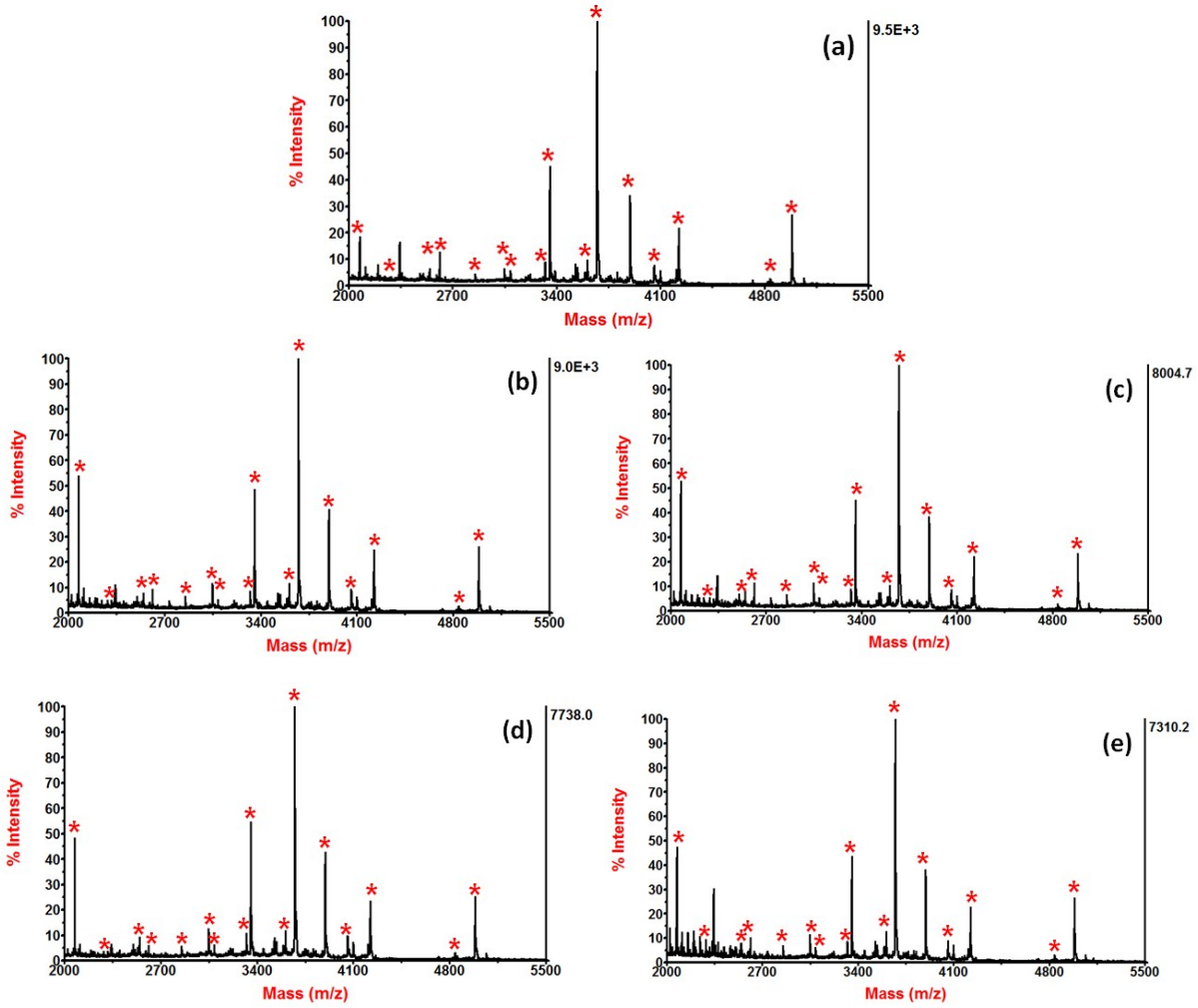

Fig. S10 MALDI-TOF-MS for the glycopeptides derived from HRP tryptic digest: (a) after treatment with MagG@COF-5 biocomposite used for the first time, (b) after enrichment with MagG@COF-5 recycled 2 times, (c) 3 times, (d) 4 times and (e) 5 times.

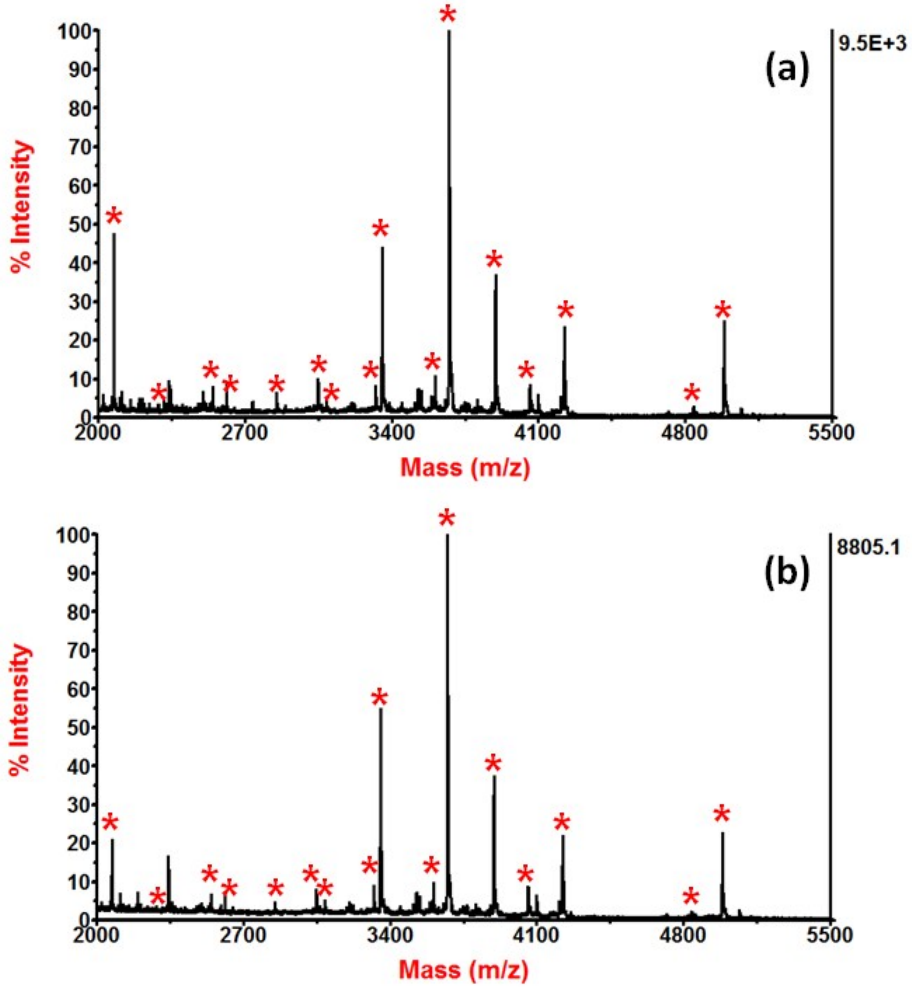

Fig. S11 MALDI-TOF-MS for the glycopeptides derived from HRP tryptic digest: (a) after treatment with the MagG@COF-5 biocomposite for the first time and (b) after enrichment with the MagG@COF-5 which had been placed for one month.

Table S1. Detailed information of the observed glycopeptides in HRP tryptic digest**.** N# denotes the N-linked glycosylation site.

No.	Observed m/z	Glycan composition	Amino acid sequence
1	2074	XylMan3GlcNAc2	PN#VSNIVR
2	2321	Man2GlcNAc2	MGN#ITPLTGTQGQIR
3	2543	XylMan3FucGlcNAc2	SSPN#ATDTIPLVR
4	2612	XylMan3GlcNAc2	MGN#ITPLTGTQGQIR
5	2850	FucGlcNAc	GLIQSDQELFSSPN#ATDTIPLVR
6	3048	XylMan2GlcNAc2	SFAN#STQTFFNAFVEAMDR
7	3087	XylMan3FucGlcNAc2	GLCPLNGN#LSALVDFDLR
8	3323	XylMan3FucGlcNAc2	QLTPTFYDNSCPN#VSNIVR
9	3354	XylMan3FucGlcNAc2	SFAN#STQTFFNAFVEAMDR
10	3606	XylMan3FucGlcNAc2	NQCRGLCPLNGN#LSALVDFDLR
11	3672	XylMan3FucGlcNAc2	GLIQSDQELFSSPN#ATDTIPLVR
12	3894	XylMan3FucGlcNAc2	LHFHDCFVNGCDASILLDN#TTSFR
13	4057	XylMan3GlcNAc2	QLTPTFYDNSC(AAVESACPR)PN#VSNIVR-H2O
14	4222	XylMan3FucGlcNAc2	QLTPTFYDNSC(AAVESACPR)PN#VSNIVR
15	4839	XylMan3FucGlcNAc2, XylMan3GlcNAc2	LYN#FSNTGLPDPTLN#TTYLQTLR
16	4984	XylMan3FucGlcNAc2, XylMan3FucGlcNAc2	LYN#FSNTGLPDPTLN#TTYLQTLR

Table S2. Data of the identified N-linked glycopeptides enriched by MagG@COF-5 biocomposite. N# denotes the N-linked glycosylation site.

No.	Sequence	Protein Group Accessions	Charge	MH+ [Da]
1	GNEANYYSN#ATTDEHGLVQFSIN#TTNVMGTSLTVR	P01023	3	3806.74729
2	LAGKPTHVN#VSVVMAEVDGTcY	P01876	3	2348.12802
3	STGKPTLYN#VSLVMSDTAGTcY	P04220	2	2366.09062
4	QQQHLFGSN#VTDcSGNFcLFR	P02787	3	2516.10770
5	ITYSIVQTN#cSK	P01042	2	1414.68926
6	NLFLNHSEN#ATAK	P00739	2	1459.71697
7	FEVDSPVYN#ATWSASLK	P04114	2	1914.91203
8	ELHHLQEQN#VSNAFLDKGEFYIGSK	P00450	3	2904.41745
9	ELHHLQEQN#VSNAFLDK	P00450	3	2022.98893
10	TKPREEQYN#STYR	P01857	4	1672.79238
11	TKPREEQFN#STFR	P01859	3	1640.80277
12	LGSFEGLVN#LTFIHLQHNR	P51884	3	2196.15781
13	KLPPGLLAN#FTLLR	P02750	2	1553.94109
14	NAHGEEKEN#LTAR	Q06033	3	1469.69657
15	VGQLQLSHN#LSLVILVPQNLK	P05155	3	2314.34671
16	VYKPSAGN#nSLYR	P02749	3	1470.72086
17	TVLTPATnHMGN#VTFTIPANR	P01024	3	2257.13065
18	YPHKPEIN#STTHPGADLQENFcR	P00734	3	2712.24405
19	FSDGLESN#SSTQFEVK	P0C0L5	2	1775.79778
20	FSDGLESN#SSTQFEVKK	P0C0L5	3	1903.89292
21	VYKPSAGN#NSLYR	P02749	3	1469.73905
22	KLHINHNN#LTESVGPLPK	P51884	4	2012.09072
23	VTQVYAEN#GTVLQGSTVASVYK	P27169	2	2315.18022
24	LPPGLLAN#FTLLR	P02750	2	1425.85100
25	LLDLSGNN#LTHLPK	P40197	3	1535.84305
26	NPPMGGnVVIFDTVITNQEEPYQN#HSGR	P02745	3	3115.46335
27	EHEAQSN#ASLDVFLGHTnVEELMK	P00736	4	2700.26601
28	SLPNFPN#TSATAN#ATGGR	Q6UXB8	2	1777.84221
29	QLAHQSN#STnIFFSPVSIATAFAmLSLGTK	P01009	3	3199.61936
30	DIVEYYN#DSN#GSHVLQGR	P25311	3	2067.92447
31	GLTFQQN#ASSmcVPDQDTAIR	P01871	2	2356.05132
32	QVFPGLnYcTSGAYSN#ASSTDSASYYPLTGDTR	P04114	3	3552.56797
33	SWPAVGN#cSSALR	P02790	2	1405.65459
34	ALPQPQN#VTSLLGcTH	P02790	2	1736.86467
35	GLTFQQN#ASSMcVPDQDTAIR	P01871	2	2340.06182
36	LSDLSIN#STEcLHVHcR	P05156	4	2041.94497
37	LQNNENN#IScVER	Q03591	2	1590.71868
38	FVEGSHN#STVSLTTK	P04114	2	1607.79314
39	QLAHQSN#STNIFFSPVSIATAFAMLSLGTK	P01009	3	3182.62937
40	KKEDALN#ETR	P10909	3	1204.61679
41	YAEDKFN#ETTEK	P43652	2	1475.65666
42	LHINHNN#LTESVGPLPK	P51884	4	1884.00039
43	IYSGILN#LSDITK	P03952	2	1437.78362

44	DKMFSQN#DTR	P02750	2	1242.54021
45	DFYVDEN#TTVR	P29622	2	1359.60820
46	EHEAQSN#ASLDVFLGHTNVEELMK	P00736	4	2699.25893
47	QVHFFVN#ASDVDNVK	Q96IY4	3	1719.83219
48	LYLGSnN#LTALHPALFQN#LSK	P22792	3	2317.21616
49	LQNNEnN#IScVER	Q03591	2	1591.70220
50	MVSHHN#LTTGATLINEQWLLTTAKNLFLN#HSEnATAK	P00739	4	4122.05434
51	LYLGSnNLTALHPALFQN#LSK	P22792	3	2316.22519
52	ADGTVnQIEGEATPVN#LTEPAK	P05090	2	2256.09258
53	ADGTVnQIEGEATPVN#LTEPAKLEVK	P05090	3	2725.37949
54	MVSHHN#LTTGATLInEQWLLTTAK	P00738	2	2681.38042
55	IIVPLnNREN#ISDPTSPLR	P01591	3	2150.14945
56	GAFISN#FSmTVDGK	P19823	2	1490.68535
57	MDGASN#VTcInSR	P08603	2	1426.59453
58	WDPEVN#cSMAQIQLcPPPPQIPNSHN#MTTTLNYR	P08603	3	4011.81772
59	SLGNVN#FTVSAEALESQELcGTEVPSVPEHGR	P01023	3	3414.60349
60	SLGNVN#FTVSAEALESQELcGTEVPSVPEHGRK	P01023	4	3542.71401
61	LQAPLN#YTEFQKPIcLPSK	P03952	3	2248.17112
62	MVSHHN#LTTGATLINEQWLLTTAK	P00739	3	2680.37802
63	VVLHPN#YSQVDIGLIK	P00738	2	1795.99626
64	VVLHPN#YSQVDIGLIKLK	P00738	4	2037.17568
65	MVSHHN#LTTGATLINEQWLLTTAK	P00739	3	2680.37802
66	TPLTAN#ITK	P01877	2	959.54119
67	SPDVIN#GSPISQK	P08603	2	1342.68486
68	KEDALN#ETR	P10909	2	1076.52178
69	GAFISN#FSMTVDGK	P19823	2	1474.68901
70	LNAENN#ATFYFK	P01042	2	1432.67497
71	HSHNNN#SSDLHPHK	P04196	3	1624.72062
72	DIENFN#STQK	P43652	2	1196.54350
73	ALGFEN#ATQALGR	Q08380	2	1348.68584
74	LVPHMN#VSAVEK	Q96KN2	2	1324.69304
75	GNEAnYYSN#ATTDEHGLVQFSInTTNVMGTSLTVR	P01023	4	3807.74624
76	NLFLN#HSEN#ATAK	P00739	2	1460.70220
77	EEQYN#STYRVVSVLTVLHQDWLnGK	P01857	3	2980.48056
78	EEQFN#STFRVVSVLTVVHQDWLnGK	P01859	4	2934.45913
79	EGYSN#ISYIVVnHQGISSR	P49908	3	2125.03672
80	ISEEN#ETTcYMGK	P08603	2	1562.63616
81	VIDFN#cTTSSVSSALAnTK	P04196	2	2016.94768
82	VIDFN#cTTSSVSSALANTK	P04196	2	2015.96050
83	AELSN#HTRPVILVPGcLGNQLEAK	P04180	4	2617.37490
84	EPGSN#VTMSVDAEcVPMVR	Q08380	2	2078.92827
85	EEQYN#STYR	P01857	2	1190.49687
86	EEQYN#STFR	P01860	2	1174.50139
87	EEQFN#STFR	P01859	2	1158.50517
88	EEQFN#STFRVVSVLTVVHQDWLNGK	P01859	3	2933.48636
89	EDALN#ETR	P10909	2	948.42705
90	SLTFN#ETYQDISELVYGAK	P01008	2	2179.04741
91	LPTQN#ITFQTESSVAEQEAEFQSPK	Q14624	3	2810.34079
92	GVNFN#VSK	P03952	2	865.44042

93	TMFPN#LTDVR	P06681	2	1194.58452
94	MFSQN#DTR	P02750	2	999.42046
95	DTFVN#ASR	P05155	2	910.42638
96	EGYSN#ISYIVVNHQGISSR	P49908	2	2124.03105
97	SLGnVN#FTVSAEALESQELcGTEVPSVPEHGR	P01023	3	3415.61826
98	VLSN#nSDANLELINTWVAK	P05155	3	2103.07999
99	VNQnLVYESGSLN#FSK	P04114	2	1800.86443
100	THTN#ISESHPN#ATFSAVGEASIcEDDWNSGER	P01871	4	3520.49917
101	YFYN#GTSmAcETFQYGGcMGnGNNFVTEK	P02760	3	3365.33200
102	YDFN#SSmLYSTAK	P04114	2	1543.66203
103	EWDN#TTTEcR	P20851	2	1312.51103
104	FLNN#GTcTAEGK	P05156	2	1312.58391
105	YFYN#GTSMAcETFQYGGcmGnGnNFVTEK	P02760	3	3366.33396
106	YLGN#ATAIFFLPDEGK	P01009	2	1756.87981
107	YLGN#ATAIFFLPDEGKLQHLENELTHDIITK	P01009	4	3541.83047
108	YTGN#ASALFILPDQDK	P01011	2	1753.86626
109	YTGN#ASALFILPDQDKMEEVEAMLLPETLKR	P01011	3	3523.77353
110	WVSN#KTEGR	P01008	2	1077.53240
111	AFEN#VTDLQWLILDHNLLENSK	P51884	3	2613.32279
112	DFVN#ASSK	P05546	2	868.40453
113	DFVN#ASSKYEITTIHNLFR	P05546	3	2256.12558
114	IYSN#HSALESLALIPLQAPLK	P55058	3	2279.26535
115	VTQN#LTLIEESLTSEFIHDIDR	P36955	3	2574.29312
116	VLSN#NSDANLELINTWVAK	P05155	3	2102.07419
117	LQN#LTLPTN#ASIK	Q13201	2	1414.77971
118	FLnN#GTcTAEGK	P05156	2	1313.56828
119	YKN#nSDISSTR	P01871	2	1286.58574
120	GLN#VTLSSTGRnGFK	P0C0L5	3	1552.79605
121	LGN#WSAmPScK	P02749	2	1267.54546
122	TLN#QSSDELQLSmGNAMFVK	P01011	2	2230.03887
123	VSN#VScQASVSR	P55058	2	1294.60747
124	LGN#WSAMPScK	P02749	2	1251.55022
125	VSN#QTLSLFFTVLQDVPVR	P01023	2	2164.16582
126	GLN#VTLSSTGR	P0C0L5	2	1105.58550
127	YKN#NSDISSTR	P01871	2	1285.60198
128	TLN#QSSDELQLSMGNAMFVK	P01011	2	2214.04375
129	LAN#LTQGEDQYYLR	P10909	2	1684.81902
130	GLN#LTEDTYKPR	Q08380	2	1407.71453
131	AVN#ITSENLIDDVVSLIR	P02748	2	1972.05730
132	HAN#WTLTPLK	P27169	2	1181.63225
133	VVN#STTGPGEHLR	P07996	2	1367.69072
134	VLN#FTTK	P13671	2	823.45421
135	FLN#DTMAVYEAK	P29622	2	1402.65788
136	RNPPMGGNVVIFDTVITNQEEPYQN#HSGR	P02745	4	3270.56167
137	NPPMGGNVVIFDTVITNQEEPYQN#HSGR	P02745	3	3114.46579
138	AVLQLNEEGVDTAGSTGVTLN#LTSKPIILR	P08185	3	3110.68210
139	LnAENN#ATFYFK	P01042	2	1433.65911
140	FN#SSYLQGTnQITGR	P04114	2	1687.79399
141	HN#STGcLR	P10909	2	945.41954

142	QnQcFYN#SSYLNVQR	P19652	2	1922.83660
143	FN#SSYLQGTNITGR	P04114	2	1686.80913
144	EN#LTAPGSDSAVFFEQGTTR	P00450	2	2127.98491
145	FN#LTETSEAEIHQSFQHLLR	P01011	3	2401.17954
146	AN#LSSQALQMSLDYGFVTPLTSMSIR	P19827	3	2831.40726
147	EN#ISDPTSPLR	P01591	2	1229.60112
148	EN#ETEIIK	P06276	2	976.48277
149	DN#NSIITR	P06276	2	933.46587
150	DN#YTDLVAIQNK	P14151	2	1394.68218
151	LVLSSEKTVLTPATNHMGN#VTFTIPANR	P01024	4	3012.57754
152	LSLHRPALEDLLLGSEAN#LTcTLTGLR	P01877	3	2964.58554
153	ALGISPFHEHAEVVFTAN#DSGPR	P02766	4	2452.21230
154	LSHNELADSGIPGNSFN#VSSLVELDLSYNK	P51884	3	3220.56736
155	GGETAQSADPQWEQLnnKN#LSMPLLPADFHK	P05546	4	3439.62563
156	ADGTVNQIEGEATPVN#LTEPAKLEVK	P05090	3	2724.39713
157	ADGTVNQIEGEATPVN#LTEPAK	P05090	2	2255.10430
158	DVQIIVFPEDGIHGFN#FTR	P43251	3	2205.10160
159	FQSPAGTEALFELHN#ISVADSAN#YScVYVDLKPPFGGSAPSER	P04217	4	4630.18813
160	SVQEIQATFFYFTPN#KTEDTIFLR	P02763	3	2896.44193
161	ADTHDEILEGLNFN#LTEIPEAQIHEGFQELLR	P01009	4	3692.81020
162	LQAILGVPWKDKN#cTSR	P01019	4	1987.04213
163	VNQNLVYESGSLN#FSK	P04114	2	1799.88213
164	IYPGVDFGGEELN#VTFVK	P03952	3	1984.98117
165	LGTSLSSGHVLMN#GTLK	P80108	3	1715.89780
166	TVLTPATNHMGN#VTFTIPANR	P01024	3	2256.14518
167	FNPGAESVVLSN#STLK	Q13201	2	1663.85381
168	SVVAPATDGGLN#LTSTFLR	P41222	2	1920.00615
169	AALAAFNAQNN#GSNFQLEEISR	P02765	2	2366.13994
170	QSVPAHFVALN#GSK	P06681	2	1455.75810
171	LDAPTNLQFVN#ETDSTVLVR	P02751	3	2233.13907
172	SLDFNTLVDN#ISVDPETGDLWVGcHPnGMK	P27169	3	3332.53232
173	SRYPHKPEIN#STTHPGADLQENFcR	P00734	4	2955.37246
174	EHEGAIYPDN#TTDFQR	P00450	2	1893.82207
175	TVIRPFYLTN#SSGVD	Q08380	2	1669.84490
176	DIVEYYNDSN#GSHVLQGR	P25311	3	2066.93991
177	VVAEGFDFAnGINISPDGK	P27169	2	1950.94780
178	SQILEGLGFN#LTELSESDVHR	P29622	3	2345.16520
179	IIVPLNNREN#ISDPTSPLR	P01591	2	2149.15923
180	AQLLQGLGFN#LTER	P08185	2	1560.83916
181	nGTGHGN#STHHGPEYmR	P02790	2	1869.75981
182	nGTGHGN#STHHGPEYMR	P02790	2	1853.76348
183	nLFLN#HSEN#ATAK	P00739	2	1461.68584
184	nN#ATVHEQVGGPSLTSDLQAQSK	P04004	3	2383.13816
185	N#TTcQDLQIEVTVK	P0C0L5	2	1649.80498
186	N#HScSEGQISIFR	O75882	2	1535.69121
187	N#GTGHGNSTHHGPEYMR	P02790	4	1852.77736
188	N#NSDISSTR	P01871	2	994.44310
189	N#YTLTGR	P10643	2	825.41008
190	N#LSMPLLPADFHK	P05546	3	1483.76236

191	RNPPmGGNVVIFDTVITNQEEPYQN#HSGR	P02745	3	3286.55344
192	NPPmGGNVVIFDTVITNQEEPYQN#HSGR	P02745	3	3130.46299
193	TVLTPATNHmGN#VTFTIPANR	P01024	3	2272.14054
194	mVSHHN#LTTGATLINEQWLLTTAKnLFLnHSEnATAK	P00739	4	4139.06264
195	mVSHHN#LTTGATLINEQWLLTTAK	P00738	4	2696.37441
196	mLN#TSSLLEQLNEQFNWVSR	P10909	2	2426.17241
197	VYLQGLIDcYLFGN#SSTVLEDSK	P35542	3	2622.27024
198	LKELPGVcN#ETMMALWEEcKPcLK	P10909	3	2937.36490
199	WVLTAAHcLLYPPWDKN#FTENDLLVR	P00734	4	3172.60244
200	TELFSSScPGGIMLN#ETGQGYQR	O95445	2	2533.14018
201	DTAVFEcLPQHAMFGN#DTITcTTHGnWTKLPEcR	P02749	4	4009.75918
202	DTAVFEcLPQHAMFGN#DTITcTTHGnWTK	P02749	4	3354.45376
203	DTAVFEcLPQHAmFGN#DTITcTTHGnWTK	P02749	3	3370.45603
204	DAGVVcTN#ETR	Q08380	2	1222.53752
205	ELPGVcN#ETMMALWEEcKPcLK	P10909	3	2696.19449
206	LTDTIcGVGN#MSAN#ASDQER	P06681	2	2140.91362
207	LTDTIcGVGN#mSAnASDQER	P06681	2	2156.90996
208	AATcINPLN#GSVcERPAN#HSAK	O75882	3	2369.09653
209	QDQcIYN#TTYLNVQREnGTISR	P02763	3	2675.23862
210	QDQcIYN#TTYLnVQR	P02763	2	1917.88152
211	QNQcFYN#SSYLNVQR	P19652	2	1921.85088
212	LGAcN#DTLQQLMEVFK	P01008	2	1867.89372
213	LGAcN#DTLQQLMEVFKFDTISEK	P01008	3	2688.29697
214	DKIcDLLVANNHFAHFFAPQN#LTnMNK	P19827	4	3174.53896
215	DKIcDLLVANNHFAHFFAPQN#LTNMNK	P19827	4	3173.53042
216	LGHcPDPVLVNGEFSSSGPVN#VSDK	P20851	3	2612.21994
217	LGHcPDPVLVnGEFSSSGPVN#VSDK	P20851	3	2613.22062
218	VTAcHSSQPN#ATLYK	P05543	3	1677.79428
219	KVScPIMPcSN#ATVPDGEccPR	P07996	3	2536.07645
220	GIcN#SSDVR	O75882	2	1008.44145
221	IPcSQPPQIEHGTIN#SSR	P08603	2	2021.97270
222	KVcQDcPLLAPLN#DTR	P02765	2	1900.92681
223	GcVLLSYLN#ETVTVSASLESVR	P01023	3	2398.21653
224	FcRDN#YTDLVAIQNK	P14151	3	1857.88144
225	IcDLLVANNHFAHFFAPQN#LTNMNK	P19827	3	2930.41312
226	VcQDcPLLAPLN#DTR	P02765	2	1772.83183
227	FSLLGHASIScTVEN#ETIGVWRPSPPTcEK	P04003	4	3373.61855
228	LEPVHLQLQcMSQEQLAQVAAN#ATK	Q96PD5	3	2808.40537
229	cIQAN#YSLMEnGK	P05090	2	1529.66448
230	cIQAN#YSLMEnGKIK	P05090	3	1770.83768
231	cIQAN#YSLmENGK	P05090	2	1544.67436
232	cSDGWSFDATTLDDN#GTMLFFK	P02790	2	2529.06328