Supplemental Table 4. Glycopeptides identified by PNGase F + $H_2{}^{18}O$ method.

Protein name	UniProt ID	Peptide	Starting position	Glycosite	Type	No. of Spectra	Max Mascot Ion score
HLA class I histocompatibility antigen, Cw-2 alpha chain	1C02_HUMAN	$GYYN@QSEAGSHTLQR	107	N110	Known	11	66.9
Aminopeptidase N	AMPN_HUMAN	AEFN@ITLIHPk	231	N234	Known	3	53.5
		AEFN@ITLIHPK	231	N234	Known	2	45.2
		$N@ATLVNEADk	818	N818	Known	10	49.9
		$N@ATLVNEADK	818	N818	Known	4	60.2
		N@ATLVnEADk	818	N818	Known	1	40.6
Alpha-N-acetylglucosaminidase	ANAG_HUMAN	$VFPQVN@VTK	256	N261	Potential	1	36.4
Angiopoietin-2	ANGP2_HUMAN	LTDVEAQVLN@QTTR	142	N151	Potential	7	76.6
		$IVTATVN@nSVLQK	234	N240	Potential	3	47.2
		IVTATVN@NSVLQK	234	N240	Potential	2	44.1
Basigin (Fragment)	BASI_HUMAN	ILLTcSLN@DSATEVTGHR	37	N44	Novel	1	46.1
Cadherin-13	CAD13_HUMAN	$N@ITAVGk	86	N86	Known	2	39.3
Cadherin-2 (Fragment)	CADH2_HUMAN	SN@ISILR	662	N663	Novel	3	38.3
Dipeptidyl peptidase 1	CATC_HUMAN	$DVN@cSVmGPQEK	51	N53	Known	8	51.2
		DVN@cSVmGPQEk	51	N53	Known	3	41.6
Cathepsin D	CATD_HUMAN	$GSLSYLN@VTR	257	N263	Known	6	47.1
		GSLSYLN@VTR	257	N263	Known	17	71.7
CD109 antigen	CD109_HUMAN	$TQDEILFSN@STR	110	N118	Known	9	73.9
		TQDEILFSN@STR	110	N118	Known	16	85.0
CD166 antigen	CD166_HUMAN	N@ATVVWmk	361	N361	Potential	1	39.3
CD59 glycoprotein	CD59_HUMAN	TAVN@cSSDFDAcLITk	40	N43	Known	2	67.9
		TAVN@cSSDFDAcLITK	40	N43	Known	13	102.0
Clusterin	CLUS_HUMAN	$LAN@LTQGEDQYYLR	372	N374	Known	1	58.3
		LAN@LTQGEDQYYLR	372	N374	Known	20	78.1

Collagen alpha-2(V) chain	CO5A2_HUMAN	EASQN@ITYIck	1396	N1400	Potential	2	42.3
Dystroglycan	DAG1_HUMAN	N@cSTITLQN@ITR	641	N641	Potential	20	84.2
EGF domain-specific O-linked N-acetylglucosamine transferase	EOGT_HUMAN	LN@ITQEGPk	353	N354	Potential	1	37.2
Ephrin type-A receptor 2	EPHA2_HUMAN	TASVSIN@QTEPPk	429	N435	Known	1	49.9
Ephrin type-B receptor 2	EPHB2_HUMAN	$AGFEAVEN@GTVcR	258	N265	Potential	12	63.6
Erythroid membrane-associated protein	ERMAP_HUMAN	cLIqVGN@LSK	126	N132	Potential	1	38.5
Peptidyl-prolyl cis-trans isomerase FKBP10	FKB10_HUMAN	YHYN@GTFEDGk	67	N70	Potential	9	52.0
Follistatin-related protein 1	FSTL1_HUMAN	$GSN@YSEILDk	142	N144	Potential	9	45.1
		$GSN@YSEILDK	142	N144	Potential	4	44.5
		GSN@YSEILDK	142	N144	Potential	2	41.4
		$FVEQN@ETAIN@ITTYPDQENnK	171	N175,N180	Known	1	52.3
		FVEQN@ETAIN@ITTYPDQENnK	171	N175,N180	Known	1	67.7
N-acetylglucosamine-6-sulfatase	GNS_HUMAN	$GASN@LTWR	402	N405	Potential	2	38.8
Golgi membrane protein 1	GOLM1_HUMAN	$AVLVnN@ITTGER	104	N109	Known	6	62.3
		$AVLVNN@ITTGER	104	N109	Known	2	45.0
Granulins	GRN_HUMAN	$EN@ATTDLLTK	264	N265	Known	1	41.3
		EN@ATTDLLTk	264	N265	Known	2	38.8
Beta-hexosaminidase subunit alpha	HEXA_HUMAN	SAEGTFFIN@k	149	N157	Known	3	52.3
Hedgehog-interacting protein	HHIP_HUMAN	$IFSVTN@NTEcGK	94	N99	Potential	9	74.7
		IFSVTN@nTEcGk	94	N99	Potential	1	40.1
		IFSVTN@NTEcGk	94	N99	Potential	14	63.8
Hypoxia up-regulated protein 1	HYOU1_HUMAN	VFGSQN@LTTVk	510	N515	Known	8	51.1
		$AEPPLN@ASASDQGEK	926	N931	Known	3	62.5
Intercellular adhesion molecule 2	ICAM2_HUMAN	$GSLEVN@cSTTcNQPEVGGLETSLDk	42	N47	Known	4	82.3
		$GSLEVN@cSTTcNQPEVGGLETSLDK	42	N47	Known	10	88.5
		$QESmnSN@VSVYQPPR	99	N105	Known	2	46.3
		$QESmNSN@VSVYQPPR	99	N105	Known	4	49.3

		QESmnSN@VSVYQPPR	99	N105	Known	5	41.7
		QESmnSN@VSVYQPPR	99	N105	Known	2	48.6
		QESMnSN@VSVYQPPR	99	N105	Known	1	44.9
		QESmNSN@VSVYQPPR	99	N105	Known	11	72.1
		$GN@ETLHYETFGk	152	N153	Known	19	64.9
		$GN@ETLHYETFGK	152	N153	Known	16	60.5
		GN@ETLHYETFGK	152	N153	Known	1	33.6
		$AAPAPQEATATFN@STADR	164	N176	Known	34	86.4
		AAPAPQEATATFN@STADR	164	N176	Known	14	79.5
ICOS ligand	ICOSL_HUMAN	$LFN@VTPQDEQK	100	N102	Known	1	39.4
Ig gamma-4 chain C region	IGHG4_HUMAN	$EEQFN@STYR	173	N177	Known	4	38.9
Interleukin-6 receptor subunit beta	IL6RB_HUMAN	ETHLETN@FTLk	151	N157	Known	3	57.1
		SHLQN@YTVN@ATk	375	N379	Known	1	58.6
		$LTVN@LTnDR	387	N390	Known	5	43.4
		$LTVN@LTNDR	387	N390	Known	3	40.7
		LTVN@LTNDR	387	N390	Known	1	45.6
Interleukin-1 receptor-like 1	ILRL1_HUMAN	NAN@LTcSAcFGk	230	N232	Potential	6	60.8
Integrin alpha-2	ITA2_HUMAN	$GEYFVN@VTTR	1069	N1074	Potential	3	42.1
Integrin alpha-5	ITA5_HUMAN	VTGLN@cTTNHPINPk	864	N868	Potential	1	55.1
Integrin beta-1	ITB1_HUMAN	NPcTSEQN@cTSPFSYk	205	N212	Known	1	40.6
Integrin beta-5	ITB5_HUMAN	SN@LTVLR	704	N705	Potential	10	38.3
Lysosome-associated membrane glycoprotein 1	LAMP1_HUMAN	$SScGKEN@TSDPSLVIAFGR	78	N84	Known	7	66.7
		SScGkEN@TSDPSLVIAFGR	78	N84	Known	7	50.4
		$EN@TSDPSLVIAFGR	83	N84	Known	7	79.4
		EN@TSDPSLVIAFGR	83	N84	Known	14	79.9
		GHTLTLN@FTR	97	N103	Known	2	40.6
		$LLNINPN@k	255	N261	Known	1	33.0

		LLNINPN@k	255	N261	Known	2	38.7
Lysosome-associated membrane glycoprotein 2	LAMP2_HUMAN	$VASVININPN@TTHSTGScR	248	N257	Known	1	52.9
		VASVININPN@TTHSTGScR	248	N257	Known	2	75.1
		LN@SSTIk	274	N275	Known	7	42.6
		$VQPFN@VTQGk	352	N356	Known	6	51.0
		$VQPFN@VTQGK	352	N356	Known	6	63.4
		VQPFN@VTQGk	352	N356	Known	2	47.7
Latent-transforming growth factor beta-binding protein 2	LTBP2_HUMAN	DEcWcPAN@STGk	414	N421	Potential	11	49.9
Lysosomal alpha-glucosidase	LYAG_HUMAN	N@NTIVNELVR	882	N882	Known	5	50.7
Lymphatic vessel endothelial hyaluronic acid receptor 1	LYVE1_HUMAN	$ANQQLN@FTEAK	48	N53	Known	9	60.0
		ANQQLN@FTEAk	48	N53	Known	14	65.8
		ANQQLN@FTEAK	48	N53	Known	1	38.5
Tyrosine-protein kinase Mer	MERTK_HUMAN	SDN@GSYIck	168	N170	Potential	2	34.4
		$ELLEEVGQN@GSR	434	N442	Known	13	48.1
		ELLEEVGQN@GSR	434	N442	Known	4	49.2
Hepatocyte growth factor receptor	MET_HUMAN	$AN@LSGGVWk	105	N106	Known	1	37.8
MHC class I polypeptide-related sequence A	MICA_HUMAN	SEASEGN@ITVTcR	214	N220	Potential	1	58.2
MHC class I polypeptide-related sequence B	MICB_HUMAN	N@ITLTWR	234	N234	Novel	1	34.8
Multimerin-1	MMRN1_HUMAN	LQN@LTLPTN@ASIK	112	N114	Known	1	47.1
		FNPGAESVVLSN@STLk	125	N136	Known	4	69.3
		FNPGAESVVLSN@STLK	125	N136	Known	6	62.4
		VN@ESVVSIAAQQk	430	N431	Potential	9	55.3
		SILYYESLN@k	499	N507	Potential	1	40.4
		LN@QSNFQk	815	N816	Potential	2	40.0
		TQAALSN@LTccIDR	975	N981	Potential	2	53.4
Myelin protein zero-like protein 1	MPZL1_HUMAN	EIFVAN@GTQGk	45	N50	Known	1	49.3
C-type mannose receptor 2	MRC2_HUMAN	$VTPAcN@TSLPAQR	64	N69	Known	6	50.9

		VTPAcN@TSLPAQR	64	N69	Known	14	64.3
Natural cytotoxicity triggering receptor 3 ligand 1	NR3L1_HUMAN	NmDGTFN@VTScLk	202	N208	Known	3	65.5
		SN@FTLTAAR	241	N242	Known	3	43.8
Neuronal cell adhesion molecule	NRCAM_HUMAN	FN@HTQTIQQk	222	N223	Potential	1	39.7
		$ERPPTFLTPEGN@ASNk	265	N276	Known	4	46.1
		$ERPPTFLTPEGN@ASNK	265	N276	Known	1	43.1
		ERPPTFLTPEGN@ASNk	265	N276	Known	1	46.8
		ERPPTFLTPEGN@ASNK	265	N276	Known	3	53.2
Neuropilin-1	NRP1_HUMAN	GPEcSQN@YTTPSGVIk	144	N150	Known	1	44.5
Neuropilin-2	NRP2_HUMAN	N@FTSPN@GTIESPGFPEk	152	N152	Known	1	53.8
		N@FTSPN@GTIESPGFPEK	152	N152	Known	1	36.6
Protocadherin gamma-A11	PCDGB_HUMAN	$GSFVGN@ISk	43	N48	Potential	3	42.8
Protocadherin gamma-B5	PCDGH_HUMAN	DQGSPALSAN@VSLR	532	N541	Potential	1	38.1
Platelet-derived growth factor subunit B	PDGFB_HUMAN	LLHGDPGEEDGAELDLN@mTR	47	N63	Novel	2	51.8
Basement membrane-specific heparan sulfate proteoglycan core protein	PGBM_HUMAN	$ALVN@FTR	86	N89	Potential	1	34.0
Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	PLOD1_HUMAN	$EQIN@ITLDHR	194	N197	Potential	4	47.5
Procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	PLOD3_HUMAN	SAEFFN@YTVR	58	N63	Potential	9	52.4
Palmitoyl-protein thioesterase 1	PPT1_HUMAN	N@HSIFLADINQER	197	N197	Known	5	60.9
Major prion protein	PRIO_HUMAN	$GEN@FTETDVk	195	N197	Known	3	43.7
		$GEN@FTETDVK	195	N197	Known	17	60.8
Serine protease 23	PRS23_HUMAN	QYLSYETLYAN@GSR	83	N93	Potential	1	42.7
Inactive tyrosine-protein kinase 7	PTK7_HUMAN	$SAN@ASFNIK	114	N116	Known	1	36.8
		$DGTPLSDGQSN@HTVSSk	165	N175	Known	1	44.2
		$DGTPLSDGQSN@HTVSSK	165	N175	Known	13	63.3
		DGTPLSDGQSN@HTVSSk	165	N175	Known	3	69.8
		DDAGN@YTcIASnGPQGQIR	563	N567	Potential	2	50.3
		DDAGN@YTcIASNGPQGqIR	563	N567	Potential	1	49.1

		mHIFQN@GSLVIHDVAPEDSGR	641	N646	Known	1	44.8
Poliovirus receptor-related protein 1	PVRL1_HUMAN	NPN@GTVTVISR	200	N202	Known	11	74.6
Reticulocalbin-3	RCN3_HUMAN	N@ATYGHYAPGEEFHDVEDAETYk	140	N140	Known	1	48.7
Proactivator polypeptide	SAP_HUMAN	TN@STFVQALVEHVK	214	N215	Known	1	43.8
		$LIDnN@KTEK	328	N332	Known	1	38.6
		LIDnN@KTEk	328	N332	Known	9	50.5
Semaphorin-4D	SEM4D_HUMAN	DVN@YTQIVVDR	417	N419	Known	3	42.5
Tyrosine-protein phosphatase non-receptor type substrate 1	SHPS1_HUMAN	$GTAN@LSETIR	242	N245	Known	1	52.5
		GTAN@LSETIR	242	N245	Known	1	40.2
		$AEnQVN@VTcQVR	265	N270	Known	1	46.5
		$AENQVN@VTcQVR	265	N270	Known	8	68.6
		LQLTWLEnGN@VSR	283	N292	Known	9	90.8
Stabilin-1	STAB1_HUMAN	TmN@ASLAQQLcR	411	N413	Potential	4	49.4
		$SLEAQGN@SSHLDADTVR	1172	N1178	Potential	5	57.5
		SLEAQGN@SSHLDADTVR	1172	N1178	Potential	1	56.4
Tissue factor pathway inhibitor 2	TFPI2_HUMAN	$DEGLcSAN@VTR	163	N170	Potential	1	38.5
Thrombospondin-1	TSP1_HUMAN	$VScPImPcSN@ATVPDGEccPR	351	N360	Potential	1	40.5
		$VVN@STTGPGEHLR	1065	N1067	Known	11	54.4
Vascular endothelial growth factor receptor 1	VGFR1_HUMAN	VTSPN@ITVTLk	160	N164	Potential	1	37.1
Vascular endothelial growth factor receptor 2	VGFR2_HUMAN	$VIGN@DTGAYk	93	N96	Potential	1	39.4
		VIGN@DTGAYk	93	N96	Potential	1	40.1
von Willebrand factor	VWF_HUMAN	$ASPPSSScN@ISSGEmQk	203	N211	Potential	24	77.1
		$ASPPSSScN@ISSGEMQk	203	N211	Potential	8	76.1
		$ASPPSSScN@ISSGEmQK	203	N211	Potential	6	49.6
		$ASPPSSScN@ISSGEMQK	203	N211	Potential	25	89.6
		ASPPSSScN@ISSGEmQk	203	N211	Potential	23	80.7
		ASPPSSScN@ISSGEMQk	203	N211	Potential	19	89.7

		ASPPSSScN@ISSGEmQK	203	N211	Potential	12	95.2
		ASPPSSScN@ISSGEMQK	203	N211	Potential	17	93.0
		$GQVYLQcGTPcN@LTcR	655	N666	Potential	7	48.8
		GQVYLQcGTPcN@LTcR	655	N666	Potential	10	67.2
		mEAcmLN@GTVIGPGk	2579	N2585	Known	6	64.9
		mEAcmLN@GTVIGPGK	2579	N2585	Known	1	38.3
Bovine proteins							
Alpha-1-acid glycoprotein	A1AG_BOVIN	TFmLAASWN@GTK	128	N136	Potential	2	56.1
Alpha-2-antiplasmin	A2AP_BOVIN	nN@mSFVVLmPTR	295	N296	Known	1	34.1
		NN@mSFVVLmPTR	295	N296	Known	6	43.0
		NN@MSFVVLmPTR	295	N296	Known	1	39.5
Apolipoprotein D	APOD_BOVIN	$GScIQAN@YSLk	59	N65	Potential	3	46.1
		$GScIQAN@YSLK	59	N65	Potential	13	52.8
		GScIQAN@YSLk	59	N65	Potential	3	43.0
		$ADGTVNQIEGEATPEN@ITEPAK	83	N98	Potential	3	51.0
		ADGTVNQIEGEATPEN@ITEPAk	83	N98	Potential	5	52.6
		ADGTVNQIEGEATPEN@ITEPAK	83	N98	Potential	6	79.3
Beta-2-glycoprotein 1	APOH_BOVIN	VcPFAGILEN@GTVR	83	N92	Known	10	101.0
		FGN@WSAQPScK	251	N253	Known	4	38.5
Coagulation factor V	FA5_BOVIN	$GSYEIIQDANEN@K	941	N952	Potential	4	92.6
Alpha-fetoprotein	FETA_BOVIN	$AEN@ATEcFETk	195	N197	Potential	6	74.5
		$AEN@ATEcFETK	195	N197	Potential	18	81.0
		$AN@FTEIQk	250	N251	Potential	2	46.5
		$AN@FTEIQK	250	N251	Potential	2	40.0
Alpha-2-HS-glycoprotein	FETUA_BOVIN	kLcPDcPLLAPLN@DSR	144	N156	Known	2	53.5
		$LcPDcPLLAPLN@DSR	145	N156	Known	13	57.8

		LcPDcPLLAPLN@DSR	145	N156	Known	4	64.4
Hemopexin	HEMO_BOVIN	SWPAVGN@cSSAIR	182	N188	Potential	4	57.7
		$FDPVTGEVN@STYPR	210	N218	Potential	18	70.6
		FDPVTGEVN@STYPR	210	N218	Potential	20	82.9
Inter-alpha-trypsin inhibitor heavy chain H4	ITIH4_BOVIN	$LAEALTTSQN@k	199	N208	Potential	2	51.7
		$LAEALTTSQN@K	199	N208	Potential	2	49.1
Serpin A3-1	SPA31_BOVIN	$FN@LTEIQEk	99	N100	Potential	6	43.7
		$FN@LTEIQEK	99	N100	Potential	2	47.6
		FN@LTEIQEk	99	N100	Potential	9	60.0
		FN@LTEIQEK	99	N100	Potential	16	50.6
Serpin A3-3	SPA33_BOVIN	SNYELN@DTLSQmGIk	313	N318	Potential	9	86.5
		SNYELN@DTLSQmGIK	313	N318	Potential	1	45.2
Serotransferrin	TRFE_BOVIN	$N@SSLcALcIGSEK	514	N514	Potential	5	60.1
		N@SSLcALcIGSEk	514	N514	Potential	6	56.3
Pantetheinase	VNN1_BOVIN	$EIGGN@YTVcQR	350	N354	Potential	1	46.2

Peptide modification symbols:

$	N-terminal TMT0 labelling (+224.15)	k	TMT0 labelling of lysine (+224.15)		
@	Deamidation-O18 (+2.99)	n	Deamidation of asparagine (+0.98)	q	Deamidation of glutamine (+0.98)
c	Carbamidomethylation of cysteine (+57.02)				
m	Oxidation of methionine (+15.99)				

Underlined glycopeptides were also detected by HCD-ETD method (Table 2)