

SUPPORTING INFORMATION

GlycoFish: A Database of Zebrafish *N*-linked Glycoproteins Identified using SPEG method coupled with LC/MS

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Abstract

Detailed information on the protein categories and protein function together with the glycosylated peptide sequences are provided in the Table S-1 and Table S-2, respectively. The updated information on the glycosylated peptides and proteins of zebrafish can be found in GlycoFish database (<http://betenbaugh.jhu.edu/GlycoFish/>).

Table S-1. Protein categorization based on their functions, enzymes used, and glycosylation motifs

Category	Trypsin Digested	Chymo-trypsin Digested	Total	Trypsin Digested		Chymotrypsin Digested		Total NXS Motif	Total NXT motif	Total NXS/NXT motif
				NXS	NXT	NXS	NXT			
Cell Adhesion	4.43%	6.47%	10.90%	14	41	1	3	15	44	59
Transporters	20.52%	3.67%	24.19%	3	13	0	2	3	15	18
Receptors	0.67%	0.81%	1.48%	3	6	0	1	3	7	10
Lipid Metabolism	0.46%	3.21%	3.68%	0	4	1	1	1	5	6
Carbohydrate Metabolism	0.07%	0.00%	0.07%	0	1	0	0	0	1	1
Unknown Function	9.39%	9.89%	19.27%	25	35	2	6	27	41	68
Extracellular Matrix	0.41%	0.00%	0.41%	1	3	0	0	1	3	4
Ion Channels and Ion-binding Molecules	2.79%	3.72%	6.52%	8	17	2	2	10	19	29
Other Proteins and Enzymes	10.07%	20.59%	30.65%	18	31	4	9	22	40	62
Development	1.19%	1.64%	2.83%	3	7	1	1	4	8	12
Total	50%	50%	100%	75	158	11	25	86	183	269
Percentage of NXS/NXT to total								32%	68%	100%

Table S-2. Functions and the glycosylation sites of the characterized glycoproteins by SPEG coupled MS methodology

Type	Name	Function	Peptides-Trypsin	Enz.
Cell Adhesion	laminin, alpha 5	receptor binding; regulation of cell adhesion, cell migration, embryonic development; cell-cell adhesion; fin development; medial and pectoral fin morphogenesis; protein localization; basement membrane; laminin-1 complex; proteinaceous extracellular matrix	(R)TAQnETQVMDEK(D) (K)ALNDAnTSVAALSDTLPK(L) (R)VINEIAnR(T) (R)DAMNEAVnNTAQTVEANNINQK(H) (K)DALEDNInSTHTR(A) (K)AnETASMALENIR(D) (K)SAVEQAnNTVAnVSGVLAPIQK(Q)	T
	novel protein similar to vertebrate laminin, alpha 4 (LAMA4)		(K)KPVNnVTTNIMK(I)	T
	integrin, alpha V	receptor activity; protein binding; cell adhesion; integrin-mediated signaling pathway; integral to membrane	(R)ELNPLnVTSPR(F) (R)AnTSDQTPSAVTER(G) (R)FLDQnDTSASGAEGR(N) (K)FSVDGNMnCSSNR(E) (R)FNnGSLLYITK(F) (K)TGLLPILDQSAPTnVTK(Q)	T
	novel protein similar to vertebrate laminin, beta family protein		(K)IETELnSTDLSR(L)	T
	Contactin-1a precursor (Neural cell recognition molecule F11) (F3/F11/contactin)	cell adhesion, anchored to membrane	(K)GTELLHnSSR(I) (K)VESLNnESTVAGYK(V) (R)AnSTGSLSDATK(I)	T
	laminin, gamma 1	cell adhesion; detection of light stimulus involved in visual perception; muscle organ development; optokinetic behavior; retinal ganglion cell axon guidance; basement membrane; proteinaceous extracellular matrix	(K)IYAnLTSLPPINTK(T) (K)IPTTSGDPNnMTLLAAEEAR(K) (R)LNNInK(T) (R)IPQInATINEANDK(T) (R)RIPQInATINEANDK(T)	T
	neurolin-like cell adhesion molecule		(K)TPLQPQIAnLTTAMEIGK(L) (K)AnVTVSCITISNDLGS DTR(S) (K)SNIFILSnVTR(Q)	T, C

			(K)EGDnVTLK(C) (L)SnVTRQNTGEY(K)	
	cell adhesion molecule n-cam	protein binding; cell adhesion; membrane	(R)DGQLPSAnTTNVK(I)	T
	neural adhesion molecule L1.1	cell adhesion; cell differentiation; multicellular organismal development; nervous system development; axon regeneration; integral to membrane	(K)ISQMTnGSLK(I) (K)ISnVSEEDSNR(Y)	T
	novel protein similar to activated leukocyte cell adhesion molecule (alcam)	identical protein binding; cell adhesion; multicellular organismal development; neuron differentiation; retina morphogenesis in camera-type eye; integral to membrane; axonogenesis involved in innervation; forebrain cell migration; retinal ganglion cell axon guidance	(K)VDEnTTYSDR(I)	T
	scavenger receptor class B, member 2	receptor activity; cell adhesion; lysosome; membrane	(R)TAVSMYMGSMGMGLFMnR(T)	T
	Slc35c2 protein	structural molecule activity; cell adhesion; integral to membrane	(K)GLSSPVTAnVTTLR(V) (R)VTnFTGSEITVR(W) (Y)EKGLSSPVTAnVTTL(R)	T, C
	laminin, alpha 1	receptor binding; regulation of cell adhesion, embryonic development; blood vessel morphogenesis; neuron migration; axonogenesis; camera-type eye development; motor axon guidance; neuron migration; notochord development; optokinetic behavior; retinal ganglion cell axon guidance; basement membrane; laminin-1 complex; proteinaceous extracellular matrix	(K)LDESSALGSADnSTQR(T)	T
	integrin, beta 4	binding; receptor activity; cell communication; cell-matrix adhesion; integrin-mediated signaling pathway; integral to membrane	(K)MFnLTGQEYVMK(M)	T
	neurolin-like cell adhesion molecule		(K)TPLQPQIAnLTTAMEIGK(L) (K)AnVTVSCITISNDLGSDTR(S) (K)SNIFILSnVTR(Q) (K)EGDnVTLK(C)	T
	laminin, gamma 1	cell adhesion; detection of light stimulus involved in visual perception; muscle organ development; optokinetic behavior; retinal ganglion cell axon guidance; basement membrane; proteinaceous extracellular matrix	(K)IYAnLTSPPINTK(T) (K)IPTTSGDPNnMTLLAEAR(K) (R)LNNInK(T) (R)IPQInATINEANDK(T) (R)RIPQInATINEANDK(T)	T
	integrin, alpha V	receptor activity; protein binding; cell adhesion; integrin-mediated signaling pathway; integral to membrane	(R)ELNPLnVTSPR(F) (R)AnTSDQTPSAVTER(G) (R)FLDQnDTSASGAEGR(N) (K)FSVDGNMnCSSNR(E) (R)FNnGSLLYITK(F) (K)TGLLPILDQSAPTnVTK(Q)	T
	neural adhesion molecule L1.2	cell adhesion; cell differentiation; multicellular organismal development; nervous system development; integral to membrane; plasma membrane	(K)DITSPPFVnTDVnGnFSAFDIK(V)	T
	protocadherin 8, ZPA domain containing protein isoform 2	calcium ion binding, homophilic cell adhesion, integral to membrane, membrane, plasma membrane	(R)GFNIQDQVFQnGSK(S) (Y)TLnETQMISF(T) (F)NIQDQVFQnGSKSF(R)	T, C
	Cell Adhesion Molecule 4	biological process; integral to membrane	(R)VnDTLPER(A)	T
Transporters	vitellogenin 1	lipid transporter activity; response to estradiol, estrogen stimulus, and xenobiotic stimulus	(R)nSTLFYIIGHHSVR(A)	T
	vitellogenin 2	lipid transporter activity; response to estradiol stimulus	(R)nSTLFYIIGHHSVR(A) (R)AQNYIYDYTTAQCSMMQDTISTFNnK(T) (R)nSTLFYIIGQHSAR(A)	T
	novel protein similar to		(R)nSTLFYIIGQHSAHVAVAR(A) (R)nSTLFNIIGHHTAR(A)	T

	vitellogenin 1 (vg1)			
	vitellogenin 3 precursor	lipid transporter activity; response to chemical stimulus	(K)YEMnLTPSK(S) (K)RDEnTSCEER(K) (K)IPSPIELVGIEAAAnLTMST(-) (K)SVFSPSKnITK(Y)	T
	novel protein similar to vitellogenin 1 (vg1)		(R)nSTLFNIIGHHTAR(A)	T
	novel solute carrier protein		(K)GLTVSnTSAR(G)	T
	synaptophysin-like protein	transporter activity; integral to membrane; synaptic vesicle	(K)VPTCEAnSTTFR(T)	T
	ERO1-like	FAD binding; oxidoreductase activity; protein binding; electron transport chain; oxidation reduction; protein thiol-disulfide exchange; transport; endoplasmic reticulum; membrane	(K)LGAVnGSLSDETR(Q)	T
	ERGIC and golgi 3 isoform 2	molecular function, transport, vesicle-mediated transport, golgi apparatus, endoplasmic reticulum, integral to membrane	(F)GLDNInMTHF(I)	C
	retinol binding protein 4, plasma	retinoid binding; transporter activity; liver development	(F)AVQQDFnRTRY(Q)	C
	Solute carrier family 1 (glial high affinity glutamate transporter), member 3	sodium:dicarboxylate symporter activity; dicarboxylic acid transport; membrane	(K)VLVnDTVFSLNnGTQELK(R)	T
Receptors	insulin-like growth factor 2 receptor	protein binding; receptor activity; transporter activity; cytoplasm; integral to membrane	(R)LHnATGDIR(A) (R)YQnQTLR(Y) (K)VSPAFLDFnSSK(K)	T
	cation-dependent mannose-6-phosphate receptor	mannose transmembrane transporter activity; receptor activity; protein domain specific binding; protein targeting to lysosome; trans-Golgi network; integral to membrane; lytic vacuole	(R)LLEPLTNQnFTTEGQEK(E)	T
	insulin-like growth factor 1a receptor	ATP binding; insulin-like growth factor binding; nucleotide binding; transferase activity; caspase inhibitor activity; insulin-like growth factor receptor signaling pathway; protein amino acid autophosphorylation and phosphorylation; transmembrane receptor protein tyrosine kinase signaling pathway; embryonic camera-type eye development; heart morphogenesis; anterior/posterior pattern formation; heart development; semicircular canal morphogenesis; spinal cord motor neuron differentiation; membrane fraction; integral to membrane	(R)AYAnSSSSLMVK(W)	T
	G protein-coupled receptor 177		(R)KLSCnFTAACK(T)	T
	fibrinogen, B beta polypeptide	protein binding, bridging; receptor binding; platelet activation; protein polymerization; signal transduction; fibrinogen complex	(R)YSGTAGNTFLEGATELFGEnR(T)	T
	rhodopsin	photoreceptor activity, signal transducer activity, retinal binding, G-protein coupled receptor protein signaling pathway, phototransduction, protein-chromophore linkage, signal transduction, visual perception, rhodopsin mediated phototransduction, integral to membrane	(Y)VPMSnATGVVRSPLY(E)	C
	insulin-like growth factor 1b receptor	ATP binding, insulin-like growth factor binding, nucleotide binding, receptor activity, transferase activity, transmembrane receptor protein tyrosine kinase activity, caspase inhibitor activity, insulin-like growth factor receptor	(K)LSNLGPGnYSVR(V)	T

		signaling pathway, protein autophosphorylation and phosphorylation, embryonic camera-type eye development, heart morphogenesis and development, germ cell migration, , semicircular canal morphogenesis, spinal cord motor neuron differentiation, membrane fraction, integral to membrane		
	integrin, beta 4	binding; receptor activity; cell adhesion; cell communication; cell-matrix adhesion; integrin-mediated signaling pathway; integral to membrane	(K)LTSnITSFR(Q)	T
Lipid Metabolism	lysosomal cofactor/neurotrophic factor prosaposin	sphingolipid metabolic process; lysosome	(R)YVDGILEQnATQSEIEEAVLK(V) (K)DnVTESELLGYLEK(A) (Y)VDGILEQnATQSEIEEAVL(K) (F)ISDTQDEARVnSSFINTL(I)	T, C
	N-acylsphingosine amidohydrolase 1 (acid ceramidase)	hydrolase activity; lipid metabolic process; lysosome	(R)VLEnSTSYEDAKDQLSQT(L) (R)KnQTVFK(S)	T
Carbohydrate Metabolism	decorin	protein binding; chondroitin sulfate proteoglycan metabolic process; cartilage development; convergent extension involved in axis elongation	(R)IADTnLTSIPK(G)	T
Unknown Function	hypothetical protein LOC541519		(R)LPVnGSVYnVTDANGK(A) (K)FLnASHK(Q) (Y)nVTDANGKAVDSEVIPL(S) (Y)IFRPnSSDPF(I)	T,C
	hypothetical protein LOC321166		(K)IDLQnNnYTVILNSDEQMLSTGLLAR(F)	T
	hypothetical protein LOC565579		(K)VYNEYnGTNTDAPSR(A) (Y)NEYnGTNTDAPSRAIDY(V)	T, C
	hypothetical protein LOC449691		(R)LYLNNnLLETVPSNLPR(S)	T
	hypothetical protein LOC554458		(R)LNQnSSNPNEVSIK(V)	T
	PREDICTED: wu:fc41f10, si:dkey-9i23.11		(K)MSnVTLR(F) (R)FYDnDSAITLVENGVPVGK(N)	T
	hypothetical protein LOC415149		(K)AGVFDnATDLR(W) (R)LDGNnITHSSMPDDTANCLR(Q) (R)WLVLDNNnITSDK(I) (K)LTSFPANTLAGMEnLTTVHLSK(N)	T
	hypothetical protein LOC324985		(R)LQLQPFnITANR(F) (R)LnSTYR(C)	T
	hypothetical protein LOC556537		(K)YQPInTTEEAGLLK(E) (K)EVLLPAnETS YTLDK(L)	T
	hypothetical protein LOC563738		(K)VQSYnCSVQQVTAR(A)	T
	hypothetical protein LOC393249		(K)ENLQLnISSAK(A)	T
	Sc:d0144 protein		(K)ATDVNGVLSLYnISK(D) (R)VTSA DnR(T)	T
	hypothetical protein LOC445125		(K)NEnDTLVNYAVNPVVR(E)	T
	LOC553381 protein		(R)KnVTLEGDSIQA AHSK(L) (K)VLEnATVAK(E)	T
	hypothetical protein LOC336746		(K)MFnLTGQEYVMK(M)	T
	elastin microfibril interfacier 1a		(R)MNNLnSSIR(N) (K)HGnITDLNTSK(G)	T
	hypothetical protein LOC568615		(K)GSQIFNE nETYPR(A)	T
	hypothetical protein LOC562774		(K)DMSDGFISnLTIQR(Q)	T
	hypothetical protein LOC393213		(R)TTnGSGPLNK(L)	T
	protocadherin-gamma		(K)AQDGGSPPLSSnASVK(I)	T

	novel protein similar to vertebrate thrombospondin 1. _n		(K)VVnSTTGPEHLR(N)	T
	LOC553337 protein [Danio rerio]		(K)TQADGVSDNInK(T)	T
	hypothetical protein LOC541367		(R)VPNFGGnVTLR(E)	T
	hypothetical protein LOC554550		(K)LnSTSMALSLPR(T)	T
	Asph protein		(R)YnLSEVLQ GK(L)	T
	PREDICTED: wu:fi04f09		(R)ME nVSGQLK(D)	T
	hypothetical protein LOC393392		(R)InTTS DER(D)	T
	hypothetical protein LOC492466		(R)ELFnTSLK(S)	T
	hypothetical protein LOC436653		(K)LVnVSLPK(K)	T
	hypothetical protein LOC550326		(K)nVTTVGHK(K) (K)SSMVAQLTGYTnVTSGDILALK(A)	T
	hypothetical protein LOC619255		(K)VEMIDIGTQTLAnGSSIDLPK(V)	T
	hypothetical protein LOC399488		(R)EVAQAVESLYSTYnQTR(L)	T
	hypothetical protein LOC407979		(R)DLQGNPISnASVSVEGIDHDITTAK(D)	T
	cat eye syndrome critical region protein 1-A homolog precursor		(R)KInATEAVK(T)	T
	PREDICTED: similar to Histone H1.5 (Histone H1a) isoform 2		(K)ALVTnGTLA QTK(G)	T
	translocon-associated protein beta		(R)IAPASnVSHTV VLRPLK(A)	T
	procollagen type I alpha 1 chain		(L)RLMSTEASQnITY(H)	C
	PREDICTED: similar to lysosomal-associated membrane protein 2 isoform 2		(F)SLnSTSNKY(H)	C
	hypothetical protein LOC393175		(K)AnFSVQIR(R)	T
	putative galactose-binding protein		(F)SVGPAGQLGVnGT Y(Y)	C
	hypothetical protein LOC322814		(R)ETTLV GnQSSR(F)	T
	hypothetical protein LOC641570		(F)VQTAFGnNTEIIPAGGAGY(K)	C
	choline transporter-like protein 2		(K)nASIVMEGR(Q)	T
	hypothetical protein LOC447841		(L)HNA nSSQL(R)	C
	novel protein		(K)FLQInSSSER(L)	T
	hypothetical protein LOC678538		(R)TnTSYVK(L)	T
	hypothetical protein LOC798421		(R)HANQTVAGIDK(L)	T
	hypothetical protein LOC566506		(K)YYnYTL SVNGR(A)	T
	PREDICTED: serpin peptidase inhibitor, clade F,		(K)LnISDMYAR(F)	T

	member 2, like			
	hypothetical protein LOC541416		(R)GGLPLnETTIAEVLK(T)	T
	cadherin 15		(R)VnATDKDQR(G)	T
	hypothetical protein LOC404631		(R)IYSnGSDLSVER(V)	T
	neural cell adhesion molecule 3		(R)DGFQLPNAnTSNIK(I)	T
Extracellular Matrix	fibrinogen alpha chain	protein binding, bridging; receptor binding; platelet activation; protein polymerization; signal transduction; extracellular space; fibrinogen complex	(R)EDGSVNFnR(T)	T
	fibrinogen gamma polypeptide	protein binding, bridging; receptor binding; platelet activation; protein polymerization; signal transduction; extracellular space; fibrinogen complex	(K)KLDDMEQDLEEIANLTR(G)	T
	Matn1 protein	adaptor proteins in extracellular matrix	(R)EGFTLMnDSR(S)	T
	fibronectin 1b	extracellular region	(R)nYTDCTAEGR(R)	T
Ion Channels and Ion Binding Molecules	purinergic receptor P2X4	extracellular ATP-gated cation channel activity; ATP binding; ion channel activity; receptor activity; cation transport; ion transport; integral to membrane	(K)IVDPPNPPLLADAEFTVLIK(N) (K)GIALTnTSELGER(I)	T
	ATPase, Na ⁺ /K ⁺ transporting, beta 2a polypeptide	sodium:potassium-exchanging ATPase activity; ATP biosynthetic process; potassium ion transport; sodium ion transport; integral to membrane	(K)AQVnYSQPLVAVK(F)	T
	PREDICTED: wu:fq25a07	extracellular-glutamate-gated ion channel activity; ionotropic glutamate receptor activity; ion transport; cell junction; integral to membrane; outer membrane-bounded periplasmic space; plasma membrane; postsynaptic membrane	(K)nLSVAILR(L)	T
	procollagen-lysine 2-oxoglutarate 5-dioxygenase 3	L-ascorbic acid binding; iron ion binding; oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen, procollagen-lysine 5-dioxygenase activity; oxidation reduction; motor axon guidance; endoplasmic reticulum	(R)LVSSANYnISR(L) (K)FnMTLDHR(S)	T
	coagulation factor II (thrombin)	calcium ion binding; catalytic activity; hydrolase activity; peptidase activity; serine-type endopeptidase activity; blood coagulation; extracellular region	(K)IDEFnVTQLK(L)	T
	Atp1b1a protein	sodium:potassium-exchanging ATPase activity; ATP biosynthetic process; potassium ion transport; sodium ion transport; integral to membrane	(K)FYnITTDVDVR(V)	T
	hexosaminidase-like	beta-N-acetylhexosaminidase activity; catalytic activity; cation binding; hydrolyzing O-glycosyl compounds; carbohydrate metabolic process; cellular component; angiogenesis	(R)NSYAVQPQnFSGTEEQK(K) (R)DDYGAYFVnK(T) (Y)AVQPQnFSGTEEQK(L)(V)	T,C
	myosin, light polypeptide 3, skeletal muscle	calcium ion binding	(K)EGnGTVMGAE(L)(I)	T
	Ceruloplasmin	copper ion binding; oxidoreductase activity	(R)AnYTVEK(C)	T
	dopachrome tautomerase isoform 2	metal ion binding; oxidoreductase activity; metabolic process; cellular component	(R)LVTLcNGTNEGSLR(R) (R)DFDSPPYFTnSTFSFR(N)	T
	Zgc:64203 protein	hydrolase activity; metallopeptidase activity; zinc ion binding	(K)InTTIDEK(D)	T
	chitinase, di-N-acetyl-	catalytic activity; cation binding; hydrolyzing O-glycosyl compounds; carbohydrate metabolic process; chitin catabolic process	(R)LPEIVDPVnR(T)	T
	solute carrier family 3, member 2	catalytic activity; cation binding; carbohydrate metabolic process	(K)AGEAMWEDVnSTAEER(T)	T
	Fucosidase, alpha-	alpha-L-fucosidase activity; catalytic	(R)VQAEATVPVWYTAK(K)	T

	L- 1, tissue	activity; cation binding; carbohydrate metabolic process; fucose metabolic process		
	cadherin 1, epithelial	calcium ion binding; G-protein alpha-subunit binding; homophilic cell adhesion; cell migration and adhesion involved in gastrulation; cell-cell adhesion involved in mesendodermal cell migration ectoderm development; germ cell migration; neural tube formation; neuron migration; catenin complex; cell cortex; esosome; microvillus; integral to membrane	(K)GGFFnISTGPSR(L) (F)FnETGHF(L) (F)TAIDPDTEKKQnITY(R)	T, C
	Fkbp10 protein	protein folding; calcium ion binding	(R)YHYnGTFIDGK(R)	T
	procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha 1 polypeptide	L-ascorbic acid binding; iron ion binding; oxidoreductase activity; procollagen-proline 4-dioxygenase activity; endoplasmic reticulum	(K)DTTNGFISnLTVQR(Q)	T
	FK506 binding protein 9	protein folding; calcium ion binding	(K)YHYnATLMDGTDIGSTHMYGK(T)	T
	Leprel2 protein	L-ascorbic acid binding; iron ion binding; oxidoreductase activity; acting on paired donors, with incorporation or reduction of molecular oxygen	(K)LAQGGLVnQSDAR(L)	T
	tyrosinase	metal ion binding; monophenol monooxygenase activity; oxidoreductase activity; metabolic process; dopamine biosynthetic process from tyrosine	(R)AnLSFR(N)	T
	cadherin 2, neuronal	calcium ion binding, cell differentiation, homophilic cell adhesion, multicellular organismal development, synapse assembly, neural crest cell migration, pigment cell development, tail morphogenesis, auditory receptor cell stereocilium organization, axial mesoderm structural organization, axonal fasciculation, brain development, cardioblast differentiation, cartilage condensation, dorsal fin morphogenesis, ectoderm development, embryonic eye morphogenesis, embryonic pectoral fin morphogenesis, hindbrain and midbrain development, mesoderm morphogenesis, neuron migration, peripheral nervous system development, regulation of eye photoreceptor cell development, retina development in camera-type eye, semicircular canal morphogenesis, somitogenesis, tail morphogenesis, catenin complex, perinuclear region of cytoplasm, presynaptic membrane, integral to membrane	(K)NNLYnATFMASDNGVPR(A)	T
	carbonic anhydrase XV b	carbonate dehydratase activity; zinc ion binding; one-carbon metabolic process	(Y)INnSSNSPLMTNIF(R)	C
Other Proteins and Enzymes	serine proteinase inhibitor, clade A, member 1	serine-type endopeptidase inhibitor activity	(R)nSTLFYIIGQHSAAHVAVAR(A) (K)GnTSMMLVLPDDGK(M) (R)YDIYQDPVnQTTVMMVPYK(G)	T
	serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 1, like	serine-type endopeptidase inhibitor activity	(K)GnTSMLIVLPNDGK(M) (R)YDIYQDPVnQTTVLMVPYK(G) (Y)KGnTSML(I) (Y)DIYQDPVnQTTVL(M)	T,C
	lysosomal membrane glycoprotein 2	membrane	(K)EQSYnISDK(L) (K)TDnVSDCLLAK(M) (K)ISGnASLQTVNLDPNVTK(V) (K)VnGTCGSGGSDSSLFLTSK(D) (F)VFTnDSQKF(R)	T, C

	Thy-1 cell surface antigen		(K)LIGSTnSSSTPDSTFR(N) (R)AnVTITDNK(C) (Y)MTDNKLIGSTnSSSTPDSTF(R)	T, C
	transmembrane 9 superfamily member 3	integral to membrane	(R)IVDVnLTSEGG(V)	T
	cathepsin L, like	cystein-type peptidase activity; hydrolase activity	(R)YSAAnVTGFVDIPSGK(E)	T
	kininogen 1	cystein-type endopeptidase inhibitor activity; biological process	(K)AQnESGDVLLVR(F) (K)VVnLTLGTHNK(M)	T
	heat shock protein 90kDa beta, member 1	ATP binding; unfolded protein binding; protein folding; response to stress	(R)VLEnSTSYEDAK(D) (R)TDDEVVQREEEAIQLDGLnTSQLK(E) (R)EEEEAIQLDGLnTSQLK(E)	T
	tetraspanin 7	integral to membrane	(K)SCCnVTASVnCTSAELK(D)	T
	nicastrin	protein processing; integral to membrane	(K)DEnQTQVIR(K) (R)GHAEnESVVIAAVR(L)	T
	palmitoyl-protein thioesterase 1 (ceroid-lipofuscinosis, neuronal 1, infantile)	palmitoyl-(protein) hydrolase activity; protein modification process	(R)VVnETYK(K) (F)LADINQERVVnETY(K)	T, C
	Inter-alpha (globulin) inhibitor H3	biological process; cellular component	(R)VANVnK(S)	T
	Srl protein - sarcalumenin	GTP binding; GTPase activity; biological process	(K)TnVSKFDLPNR(D) (L)InVTEPPRVY(V)	T, C
	transforming growth factor, beta-induced	response to chemical stimulus; muscle fiber development	(R)nSTIYVNR(V)	T
	cathepsin A	serine-type carboxypeptidase activity	(K)LDPPCTnSTPSTLYLNNPLVK(S) (Y)TTnDTEVAMNNY(L)	T, C
	pituitary tumor-transforming 1 interacting protein		(K)SnTTCEDCLK(I)	T
	novel protein (zgc:85621) - cartilage associated protein		(R)YHnQTTLQMQLFAK(Q)	T
	Bsg protein - basigin	membrane	(R)TPIFnGTDDKYEIK(S)	T
	legumain	cysteine-type endopeptidase activity	(K)GVVINRnGSDVYK(G)	T
	Os9 protein	protein binding	(R)YHSQSYVnGSK(C)	T
	basigin	membrane	(R)TPIFnGTDKYEIK(S)	T
	ephrin B3	membrane	(R)INNPNPGTGnSTHPQIPPR(G)	T
	hypoxia up-regulated 1	ATP binding; nucleotide binding; endoplasmic reticulum	(K)VFGSQnLTTVK(L) (K)DKnSTSESSK(A) (K)nETVAEQEK(L) (R)LAALDSMLnHSNIFLK(S)	T
	cathepsin	serine type carboxypeptidase activity	(K)NSAAAnDTGFVDIPSGK(E)	T
	serine (or cysteine) proteinase inhibitor, clade C (antithrombin)	serine-type endopeptidase inhibitor activity; response to chemical stimulus	(K)STTFnETFQHISETVYGAK(L)	T
	periostin isoform 2	muscle attachment	(R)VLYAnASMLVNTVK(V)	T
	nothepsin	aspartic-type endopeptidase activity, hydrolase activity	(F)GQISLGRPEQnF(T)	C
	mannosidase, beta A	catalytic activity, cation binding, hydrolase activity, hydrolyzing O-glycosyl compounds, carbohydrate metabolic process	(Y)ILPnSTDSVQRY(R)	C
	tumor-associated calcium signal transducer		(L)SVQGGKnVTMENVLIY(Y)	C
	keratocan	protein binding	(L)SANALRnATQL(K)	C
	cathepsin H	cysteine-type peptidase activity, hydrolase activity	(K)EVVnITK(Y)	T
	Zgc:110372	protein binding	(F)ASNRLGASnASML(L)	C

	Zgc:112265 protein	biological process	(Y)InSTVSSRY(A)	C
	CAS1 domain containing 1	integral to membrane	(K)AnLTAIADTLEK(L)	T
	ATPase, H ⁺ transporting, lysosomal accessory protein 1	hydrogen ion transporting ATP synthase activity, rotational mechanism; eye pigment granule organization; melanosome organization; retina development in camera-type eye; retinal pigment epithelium development; proton-transporting V-type ATPase, V1 domain	(K)LnNTQPSLLAVR(L)	T
	sarcoma amplified sequence	integral to membrane	(K)IMSnDTR(I)	T
	integral membrane protein 1	oligosaccharyl transferase activity; protein glycosylation	(R)TILVDNNTWnNTHISR(V)	T
	odd Oz/ten-m homolog 3	signal transduction; integral to membrane	(K)IGPFAnTTK(Y)	T
	ectonucleotide pyrophosphatase/phosphodiesterase 5 (putative function) (ENPP5)	metabolic process; catalytic activity	(R)YnASMLFETR(V)	T
	sarcoglycan, beta	cytoskeleton organization; sarcolemma; integral to membrane; sarcoglycan complex; dystrophin-associated glycoprotein complex	(R)ITSnASSDLTIK(G)	T
Development	nicalin	peptidase activity; regulation of signal transduction; multicellular organismal development; integral to membrane; membrane	(R)VIYnLTEK(G)	T
	acetylcholinesterase	Acetylcholinesterase, carboxylesterase, cholinesterase, hydrolase activity; acetylcholine catabolic process; response to ethanol; neurotransmitter catabolic process; myofibril assembly; neuromuscular junction development; neuron development; regulation of synapse structure and activity; response to amphetamine	(K)RLnYTAEEEEK(L) (R)LnITDNIDDER(Q)	T
	versican b	intramembranous ossification; skeletal system development	(K)DTnQSVESVLDLFLGEP(R) (Y)KEDGSTEnITEGVVF(A)	T, C
	contactin 2	neuron migration; axonogenesis; central nervous system development; positive regulation of axon extension	(K)MFnLTGQEYVMK(M)	T
	cleft lip and palate associated transmembrane protein 1	molecular function; cell differentiation; multicellular organismal development; integral to membrane	(K)DYYPInDTLLNPLR(L)	T
	tenascin C	receptor binding; signal transduction; mesoderm development; neural crest cell migration; axonal fasciculation; negative regulation of axon extension	(K)LEVVKnNTR(G) (L)TAVnISDTEALL(L)	T, C
	FstIb protein	dorsal/ventral pattern formation; notochord cell differentiation and development; regulation of BMP signaling pathway	(K)FIQHnETAVQMSSYAEEENNR(L)	T
	laminin, beta 1	detection of light stimulus involved in visual perception; muscle organ development; optokinetic behavior; retinal ganglion cell axon guidance; proteinaceous extracellular matrix	(R)AnASTTDPYNLVnQSATLR(T)	T