Appendix A

Table 3.1.1: List of host cell proteins (≥1 Peptides), the expression of which increased after 96hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Stip1	Stress-induced-phosphoprotein 1	2	2	124	0.0006	21.0
Lcp1	Plastin-2	2	2	105	0.0126	12.1
Lmnb1	Lamin-B1	2	2	98	0.0284	214.2
Cbx3	Chromobox protein homolog 3	1	1	58	0.0384	3.8
Ptbp3	Polypyrimidine tract-binding protein 3	1	1	57	7.04E-06	Infinity
Pafah1b3	Platelet-activating factor acetylhydrolase IB subunit gamma	1	1	56	3.63E-06	Infinity
Alpl	Alkaline phosphatase, tissue-nonspecific isozyme	1	1	54	3.57E-05	Infinity
Ruvbl2	RuvB-like 2	1	1	51	0.0307	150.5
Clns1a	Methylosome subunit pICln	1	1	51	0.0056	2.0
Rplp2	60S acidic ribosomal protein P2	1	1	51	0.0154	2.6
Gdi2	Rab GDP dissociation inhibitor beta	1	1	50	0.0315	191.9
Psme1	Proteasome activator complex subunit 1	1	1	50	0.0047	9.2
Pafah1b2	Platelet-activating factor acetylhydrolase IB subunit beta	1	1	49	0.0178	172.4
Cst3	Cystatin-C	1	1	48	0.0437	8.4
Hnrnpk	Heterogeneous nuclear ribonucleoprotein K	1	1	48	0.0428	1.8
Rbmx	RNA-binding motif protein, X chromosome	1	1	48	0.0079	38.1
Cmpk1	UMP-CMP kinase	1	1	45	0.0124	2.7
Nsfl1c	NSFL1 cofactor p47	1	1	44	0.0095	12.9
Erp29	Endoplasmic reticulum resident protein 29	1	1	43	0.0126	484.6
Psmb8	Proteasome subunit beta type-8	1	1	43	0.0272	3.2
Srm	Spermidine synthase	1	1	41	0.0447	7.9
Uchl3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	1	1	41	0.0400	79.4
Hnrnpdl	Heterogeneous nuclear ribonucleoprotein D-like	1	1	41	9.71E-07	Infinity
Clstn1	Calsyntenin-1	1	1	40	6.90E-07	Infinity
Cct7	T-complex protein 1 subunit eta	1	1	40	0.0174	166.3

Table 3.1.2: List of host cell proteins (≥1 Peptides), the expression of which decreased after 96hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Vcp	Transitional endoplasmic reticulum ATPase	3	3	153	0.0201	323.0
Ncstn	Nicastrin	2	2	132	0.0354	2.6
Cct3	T-complex protein 1 subunit gamma	2	2	106	0.0037	41.8
Hspd1	60 kDa heat shock protein, mitochondrial	2	2	104	0.0180	28.9
Erap1	Endoplasmic reticulum aminopeptidase 1	2	2	101	0.0219	2.2
G6pdx	Glucose-6-phosphate 1-dehydrogenase X	2	2	92	0.0027	8.7
Prdx1	Peroxiredoxin-1	2	2	87	0.0168	648.7
Eef1g	Elongation factor 1-gamma	1	1	74	0.0318	23.0
Il10	Interleukin-10	1	1	73	0.0007	25.4
Ybx1	Nuclease-sensitive element-binding protein 1	1	1	72	0.0220	258.8
Pkm	Pyruvate kinase PKM	1	1	68	0.0203	2.2
Agrn	Agrin	1	1	66	0.0439	8.3
Pdia4	Protein disulfide-isomerase A4	1	1	65	0.0017	95.8
Lamc1	Laminin subunit gamma-1	1	1	64	0.0096	16935.2
Eef2	Elongation factor 2	1	1	64	0.0032	10032.8
Hnrnpa2b1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	63	0.0146	18.5
Rplp0	60S acidic ribosomal protein P0	1	1	62	0.0217	102.1
Idh2	Isocitrate dehydrogenase [NADP], mitochondrial	1	1	62	0.0058	2.0
Got1	Aspartate aminotransferase, cytoplasmic	1	1	61	1.88E-09	Infinity
Eef1b	Elongation factor 1-beta	1	1	61	3.77E-05	12401.5
Fasn	Fatty acid synthase	1	1	59	0.0004	82.0
Ddx39a	ATP-dependent RNA helicase DDX39A	1	1	55	0.0305	184.9
Psma4	Proteasome subunit alpha type-4	1	1	54	0.0050	1641.5
Rpl11	60S ribosomal protein L11	1	1	54	0.0480	44.4
Itm2b	Integral membrane protein 2B	1	1	54	0.0063	461.0
Pcna	Proliferating cell nuclear antigen	1	1	53	0.0152	1.1

Eno3	Beta-enolase	1	1	52	0.0066	10.7
Got2	Aspartate aminotransferase, mitochondrial	1	1	52	0.0066	Infinity
Fh	Fumarate hydratase, mitochondrial	1	1	49	0.0464	101.0
Tpm3	Tropomyosin alpha-3 chain	1	1	49	0.0367	341.1
Banf1	Barrier-to-autointegration factor	1	1	49	0.0044	25.3
Prep	Prolyl endopeptidase	1	1	47	0.0489	253.3
Man2b1	Lysosomal alpha-mannosidase	1	1	47	2.73E-05	Infinity
P4hb	Protein disulfide-isomerase	1	1	47	0.0044	Infinity
Prdx3	Thioredoxin-dependent peroxide reductase, mitochondrial	1	1	46	0.0002	Infinity
Lman2	Vesicular integral-membrane protein VIP36	1	1	46	0.0386	1.8
Fth1	Ferritin heavy chain	1	1	45	1.33E-06	Infinity
Cnpy2	Protein canopy homolog 2	1	1	45	0.0068	62.8
H2-K1	H-2 class I histocompatibility antigen, K-D alpha chain	1	1	45	0.0314	331.0
Rpl27a	60S ribosomal protein L27a	1	1	45	0.0033	Infinity
Gnb2l1	Guanine nucleotide-binding protein subunit beta-2-like 1	1	1	44	0.0002	17.2
Tfrc	Transferrin receptor protein 1	1	1	44	0.0002	Infinity
Hnrnpab	Heterogeneous nuclear ribonucleoprotein A/B	1	1	43	0.0300	1545.6
Gusb	Beta-glucuronidase	1	1	43	0.0282	140.2
Thop1	Thimet oligopeptidase	1	1	42	0.0190	11.6
Ncl	Nucleolin	1	1	42	0.0037	2396.9
Mdh1	Malate dehydrogenase, cytoplasmic	1	1	42	0.0355	1.7
Nme2	Nucleoside diphosphate kinase B	1	1	42	0.0017	30.0
Rpl30	60S ribosomal protein L30	1	1	41	0.0066	1475.5
Fus	RNA-binding protein FUS	1	1	41	0.0029	Infinity
Ldhc	L-lactate dehydrogenase C chain	1	1	41	0.0248	4228.3
Impdh2	Inosine-5'-monophosphate dehydrogenase 2	1	1	40	0.0407	12.6
Olfml3	Olfactomedin-like protein 3	1	1	40	0.0295	1336.7
Ctsd	Cathepsin D	1	1	40	0.0123	732.7

Table 3.1.3: List of host cell proteins (≥1 Peptides), the expression of which increased after 96hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Akr1a1	Alcohol dehydrogenase [NADP(+)]	3	3	127	0.0093	1.7
Vcp	Transitional endoplasmic reticulum ATPase	2	2	116	0.0022	2.0
Pabpc1	Polyadenylate-binding protein 1	2	2	96	0.0036	2.6
Hnrnpab	Heterogeneous nuclear ribonucleoprotein A/B	2	2	90	0.0204	4.2
Rplp0	60S acidic ribosomal protein P0	2	2	88	0.0035	3.0
Lmna	Prelamin-A/C	1	1	76	0.0269	9.2
Kpnb1	Importin subunit beta-1	1	1	61	0.0116	1.9
Pafah1b3	Platelet-activating factor acetylhydrolase IB subunit gamma	1	1	60	0.0441	3.8
Snrpb2	U2 small nuclear ribonucleoprotein B"	1	1	59	0.0000	Infinity
Pgam1	Phosphoglycerate mutase 1	1	1	58	0.0203	1.9
Tars	Threonine--tRNA ligase, cytoplasmic	1	1	57	0.0351	9.8
Alpl	Alkaline phosphatase, tissue-nonspecific isozyme	1	1	55	0.0438	1.7
Nme2	Nucleoside diphosphate kinase B	1	1	53	0.0307	8.9
Olfml3	Olfactomedin-like protein 3	1	1	53	0.0201	2.4
Cacybp	Calcyclin-binding protein	1	1	52	0.0292	2.5
Vars	Valine--tRNA ligase	1	1	51	0.0313	6.9
Qsox1	Sulfhydryl oxidase 1	1	1	50	0.0270	12.6
Asns	Asparagine synthetase [glutamine-hydrolyzing]	1	1	48	0.0386	1.8
H312	Histone H3.2	1	1	48	0.0024	10.2
Eef1g	Elongation factor 1-gamma	1	1	47	0.0196	6.6
Lmnb1	Lamin-B1	1	1	45	0.0489	7.2
U2af2	Splicing factor U2AF 65 kDa subunit	1	1	45	0.0013	11.9
Tsn	Translin	1	1	44	0.0136	2.1
Psme2	Proteasome activator complex subunit 2	1	1	44	0.0434	47.4
Cap1	Adenylyl cyclase-associated protein 1	1	1	44	0.0153	3.5
Anp32e	Acidic leucine-rich nuclear phosphoprotein 32 family member E	1	1	44	0.0480	14.3
Syncrip	Heterogeneous nuclear ribonucleoprotein Q	1	1	42	0.0226	2.5
Tpp2	Tripeptidyl-peptidase 2	1	1	42	0.0343	3.4
Tpi1	Triosephosphate isomerase	1	1	42	0.0351	16.3
Ddx39b	Spliceosome RNA helicase Ddx39b	1	1	42	0.0108	3.6
Tmpo	Lamina-associated polypeptide 2	1	1	42	0.0042	7.7

Table 3.1.4: List of host cell proteins (≥1 Peptides), the expression of which decreased after 96hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Mdh2	Malate dehydrogenase, mitochondrial	3	3	148	0.0049	3.1
Hspd1	60 kDa heat shock protein, mitochondrial	3	3	147	0.0108	3.8
Hsp90b1	Endoplasmin	3	3	145	0.0220	2.0
Psat1	Phosphoserine aminotransferase	2	2	146	0.0231	1.7
Got2	Aspartate aminotransferase, mitochondrial	2	2	113	0.0288	2.4
Ppa1	Inorganic pyrophosphatase	2	2	113	0.0102	1.8
Atp5b	ATP synthase subunit beta, mitochondrial	2	2	106	0.0059	4.3
Eef1a1	Elongation factor 1-alpha 1	2	2	105	0.0049	2.0
Prkcsh	Glucosidase 2 subunit beta	2	2	103	0.0129	4.3
Mzb1	Marginal zone B- and B1-cell-specific protein	2	2	102	0.0134	2.6
Prdx4	Peroxiredoxin-4	2	2	101	0.0109	1.9
Impdh2	Inosine-5'-monophosphate dehydrogenase 2	2	2	93	0.0090	2.5
Pdia3	Protein disulfide-isomerase A3	2	2	88	0.0011	4.7
Rps19	40S ribosomal protein S19	2	2	82	0.0198	4.0
G6pdx	Glucose-6-phosphate 1-dehydrogenase X	1	1	62	0.0438	21492.2
Rpl9	60S ribosomal protein L9	1	1	61	0.0132	4.8
Rpia	Ribose-5-phosphate isomerase	1	1	59	0.0086	1.7
Rpl38	60S ribosomal protein L38	1	1	58	0.0410	14.3
Creld2	Cysteine-rich with EGF-like domain protein 2	1	1	56	0.0016	3.2
Ywhah	14-3-3 protein eta	1	1	56	0.0386	8.6
Gnb2l1	Guanine nucleotide-binding protein subunit beta-2-like 1	1	1	52	0.0125	2.4
Hspa9	Stress-70 protein, mitochondrial	1	1	51	0.0015	6.2
Pdia4	Protein disulfide-isomerase A4	1	1	50	0.0055	1.9
Tuba1b	Tubulin alpha-1B chain	1	1	49	0.0418	2.1
P4hb	Protein disulfide-isomerase	1	1	49	0.0003	3.3
Rps10	40S ribosomal protein S10	1	1	49	0.0341	5.4
Ywhae	14-3-3 protein epsilon	1	1	47	0.0423	1.7
Sub1	Activated RNA polymerase II transcriptional coactivator p15	1	1	45	0.0203	Infinity
Arpp19	cAMP-regulated phosphoprotein 19	1	1	44	0.0207	4.8
Calu	Calumenin	1	1	43	0.0402	5.6
Erp29	Endoplasmic reticulum resident protein 29	1	1	42	0.0023	2.8
Cd44	CD44 antigen	1	1	42	0.0431	2.1
Lamc1	Laminin subunit gamma-1	1	1	41	0.0384	3.8
Hist1h4a	Histone H4	1	1	40	0.0345	58.7

Table 3.1.5: List of host cell proteins (≥1 Peptides), the expression of which increased at 31˚C when compared to 37˚C after 24hrs in temperature shifted culture, identified during quantitative label free LC/MS analysis of conditioned media from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Vcp	Transitional endoplasmic reticulum ATPase	1	1	55	0.0013	Infinity
Cct5	T-complex protein 1 subunit epsilon	1	1	48	0.0255	1.8
Man2b1	Lysosomal alpha-mannosidase	1	1	47	0.0030	3.3
Hsp90ab1	Heat shock protein HSP 90-beta	1	1	46	0.0438	11.2

Table 3.1.6: List of host cell proteins (≥1 Peptides), the expression of which decreased at 31˚C when compared to 37˚C after 24hrs in temperature shifted culture, identified during quantitative label free LC/MS analysis of conditioned media from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Cst3	Cystatin-C	3	3	151	0.0430	2.4
Man1a1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	2	2	137	0.0214	4.1
Alpl	Alkaline phosphatase, tissue-nonspecific isozyme	2	2	98	0.0480	3.4
Got2	Aspartate aminotransferase, mitochondrial	2	2	89	0.0175	2.1
Gpi	Glucose-6-phosphate isomerase	1	1	80	0.0340	480.0
Pkm	Pyruvate kinase PKM	1	1	68	0.0188	1.5
Ncstn	Nicastrin	1	1	67	0.0466	4.7
Lap3	Cytosol aminopeptidase	1	1	60	0.0148	2.1
Ifnar2	Interferon alpha/beta receptor 2	1	1	53	0.0207	6.0
Prdx4	Peroxiredoxin-4	1	1	52	0.0299	2.0
Lamc1	Laminin subunit gamma-1	1	1	52	0.0125	10.5
Ncl	Nucleolin	1	1	51	0.0187	19.2
Erap1	Endoplasmic reticulum aminopeptidase 1	1	1	51	0.0218	4.5
Nid2	Nidogen-2	1	1	49	0.0324	7.0
Cs	Citrate synthase, mitochondrial	1	1	49	0.0194	1.7
Psme2	Proteasome activator complex subunit 2	1	1	49	0.0169	2.3
Psma1	Proteasome subunit alpha type-1	1	1	48	0.0320	1.6
Man2a1	Alpha-mannosidase 2	1	1	47	0.0452	80.7
Calr	Calreticulin	1	1	46	0.0049	2.4
Ywhag	14-3-3 protein gamma	1	1	45	0.0252	2.3
Gusb	Beta-glucuronidase	1	1	44	0.0187	3.6
Nap1l1	Nucleosome assembly protein 1-like 1	1	1	42	0.0296	67.3
Fus	RNA-binding protein FUS	1	1	41	0.0058	Infinity

Table 3.1.7: List of host cell proteins (≥1 Peptides), the expression of which decreased at 31˚C when compared to 37˚C after 96hrs in temperature shifted culture, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Lamc1	Laminin subunit gamma-1	6	6	324	0.0038	4.4
Erap1	Endoplasmic reticulum aminopeptidase 1	4	4	178	0.0006	2.2
Prdx2	Peroxiredoxin-2	2	2	121	0.0163	2.0
Man2b1	Lysosomal alpha-mannosidase	2	2	116	0.0157	3.2
Rpia	Ribose-5-phosphate isomerase	2	2	108	0.0160	2.3
Pdia6	Protein disulfide-isomerase A6	2	2	98	0.0009	3.9
Uchl3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	2	2	96	0.0001	2.4
Ftl1	Ferritin light chain 1	2	2	95	0.0373	2.7
Neu1	Sialidase-1	1	1	63	0.0116	1.8
Cmpk1	UMP-CMP kinase	1	1	57	0.0208	1.7
Mfge8	Lactadherin	1	1	56	0.0413	1.8
Sil1	Nucleotide exchange factor SIL1	1	1	56	0.0046	21.7
Hrsp12	Ribonuclease UK114	1	1	56	0.0030	2.5
Clstn1	Calsyntenin-1	1	1	54	0.0221	1.8
Prkcsh	Glucosidase 2 subunit beta	1	1	54	0.0199	3.2
Mzb1	Marginal zone B- and B1-cell-specific protein	1	1	53	0.0287	2.1
Pabpc1	Polyadenylate-binding protein 1	1	1	51	0.0398	1.8
Timm13	Mitochondrial import inner membrane translocase subunit Tim13	1	1	51	0.0278	2.3
Rplp2	60S acidic ribosomal protein P2	1	1	51	0.0263	2.0
Twsg1	Twisted gastrulation protein homolog 1	1	1	50	0.0345	2.8
Ctsb	Cathepsin B	1	1	48	0.0497	27.8
Timm8a2	Putative mitochondrial import inner membrane translocase subunit Tim8 A-B	1	1	48	0.0024	2.5
Lgals3bp	Galectin-3-binding protein	1	1	47	0.0345	4.1
Pycrl	Pyrroline-5-carboxylate reductase 3	1	1	45	0.0018	3.3
Nid2	Nidogen-2	1	1	44	0.0058	2.7
Psmb8	Proteasome subunit beta type-8	1	1	43	0.0114	2.3
Erh	Enhancer of rudimentary homolog	1	1	43	0.0310	1.8
Capzb	F-actin-capping protein subunit beta	1	1	43	0.0348	1.7
Capza1	F-actin-capping protein subunit alpha-1	1	1	43	0.0246	1.8
Fth1	Ferritin heavy chain	1	1	42	0.0424	2.1
Prdx4	Peroxiredoxin-4	1	1	41	0.0189	1.9

Table 3.1.8: List of host cell proteins (≥1 Peptides), the expression of which increased at 31˚C when compared to 37˚C after 96hrs in temperature shifted culture, identified during quantitative label free LC/MS analysis of cell culture supernatant from a non-producing hybridoma cell line.

Gene symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Hsp90aa1	Heat shock protein HSP 90-alpha	3	3	132	0.0112	3.0
H2afz	Histone H2A.Z	1	1	68	0.0213	3.2
Uba1	Ubiquitin-like modifier-activating enzyme 1	1	1	62	0.0201	3.0
Snrpb2	U2 small nuclear ribonucleoprotein B''	1	1	59	0.0310	5.3
Tars	Threonine--tRNA ligase, cytoplasmic	1	1	57	0.0356	24.6
Rcc2	Protein RCC2	1	1	51	0.0180	4.1
Usp14	Ubiquitin carboxyl-terminal hydrolase 14	1	1	46	0.0489	3.1
Eprs	Bifunctional glutamate/proline--tRNA ligase	1	1	46	0.0118	2.1
Fasn	Fatty acid synthase	1	1	44	0.0446	12.1
Pgam2	Phosphoglycerate mutase 2	1	1	44	0.0367	2.0
Kpnb1	Importin subunit beta-1	1	1	43	0.0373	1.7
Syncrip	Heterogeneous nuclear ribonucleoprotein Q	1	1	42	0.0366	2.1
Rplp0	60S acidic ribosomal protein P0	1	1	41	0.0386	2.1

Table 3.1.9: Table of proteins common to 24hrs vs 96hrs 37˚C and 24hrs vs 96hrs 31˚C differentially expressed protein lists from non-producing hybridoma cell line.

Gene symbol	Description 37C	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Direction of fold change	Comparison
Hspd1	60 kDa heat shock protein, mitochondrial	2	2	104	0.0180	28.9	Down at 96hrs	24hrs vs 96hrs 37C
		3	3	147	0.0108	3.8	Down at 96hrs	24hrs vs 96hrs 31C
Rplp0	60S acidic ribosomal protein P0	1	1	62	0.0217	102.1	Down at 96hrs	24hrs vs 96hrs 37C
		2	2	88	0.0035	3.0	Up at 96hrs	24hrs vs 96hrs 31C
Alpl	Alkaline phosphatase, tissue-nonspecific isozyme	1	1	54	3.57E-05	Infinity	Up at 96hrs	24hrs vs 96hrs 37C
		1	1	55	0.0438	1.7	Up at 96hrs	24hrs vs 96hrs 31C
Got2	Aspartate aminotransferase, mitochondrial	1	1	52	0.0066	Infinity	Down at 96hrs	24hrs vs 96hrs 37C
		2	2	113	0.0288	2.4	Down at 96hrs	24hrs vs 96hrs 31C
Eef1g	Elongation factor 1-gamma	1	1	74	0.0318	23.0	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	47	0.0196	6.6	Up at 96hrs	24hrs vs 96hrs 31C
Erp29	Endoplasmic reticulum resident protein 29	1	1	43	0.0126	484.6	Up at 96hrs	24hrs vs 96hrs 37C
		1	1	42	0.0023	2.8	Down at 96hrs	24hrs vs 96hrs 31C
G6pdx	Glucose-6-phosphate 1-dehydrogenase X	2	2	92	0.0027	8.7	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	62	0.0438	21492.2	Down at 96hrs	24hrs vs 96hrs 31C
Gnb2l1	Guanine nucleotide-binding protein subunit beta-2-like 1	1	1	44	0.0002	17.2	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	52	0.0125	2.4	Down at 96hrs	24hrs vs 96hrs 31C
Hnrnpab	Heterogeneous nuclear ribonucleoprotein A/B	1	1	43	0.0300	1545.6	Down at 96hrs	24hrs vs 96hrs 37C
		2	2	90	0.0204	4.2	Up at 96hrs	24hrs vs 96hrs 31C
Impdh2	Inosine-5'-monophosphate dehydrogenase 2	1	1	40	0.0407	12.6	Down at 96hrs	24hrs vs 96hrs 37C
		2	2	93	0.0090	2.5	Down at 96hrs	24hrs vs 96hrs 31C
Lmnb1	Lamin-B1	2	2	98	0.0284	214.2	Up at 96hrs	24hrs vs 96hrs 37C
		1	1	45	0.0489	7.2	Up at 96hrs	24hrs vs 96hrs 31C

Lamc1	Laminin subunit gamma-1	1	1	64	0.0096	16935.2	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	41	0.0384	3.8	Down at 96hrs	24hrs vs 96hrs 31C
Nme2	Nucleoside diphosphate kinase B	1	1	42	0.0017	30.0	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	53	0.0307	8.9	Up at 96hrs	24hrs vs 96hrs 31C
Olfml3	Olfactomedin-like protein 3	1	1	40	0.0295	1336.7	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	53	0.0201	2.4	Up at 96hrs	24hrs vs 96hrs 31C
Pafah1b3	Platelet-activating factor acetylhydrolase IB subunit gamma	1	1	56	3.63E-06	Infinity	Up at 96hrs	24hrs vs 96hrs 37C
		1	1	60	0.0441	3.8	Up at 96hrs	24hrs vs 96hrs 31C
P4hb	Protein disulfide-isomerase	1	1	47	0.0044	Infinity	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	49	0.0003	3.3	Down at 96hrs	24hrs vs 96hrs 31C
Pdia4	Protein disulfide-isomerase A4	1	1	65	0.0017	95.8	Down at 96hrs	24hrs vs 96hrs 37C
		1	1	50	0.0055	1.9	Down at 96hrs	24hrs vs 96hrs 31C
Vcp	Transitional endoplasmic reticulum ATPase	3	3	153	0.0201	323.0	Down at 96hrs	24hrs vs 96hrs 37C
		2	2	116	0.0022	2.0	Up at 96hrs	24hrs vs 96hrs 31C

Table 3.1.10: HCPs from Hybridoma cell culture supernatant identified with one or more peptides as being common to 37˚C and 31˚C cultures. Proteins identified with two or more peptides as being common to 37˚C and 31˚C cultures are also indicated.

Gene Symbol	Description	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
Hspe1	10 kDa heat shock protein, mitochondrial	43.14	4	4.9	74	11.0	8.4	x
Ywhab	14-3-3 protein beta/alpha	26.83	4	6.4	169	28.1	4.8	x
Ywhae	14-3-3 protein epsilon	36.47	5	8.7	190	29.2	4.7	x
Ywhah	14-3-3 protein eta	30.08	4	11.3	154	28.2	4.9	x
Ywhag	14-3-3 protein gamma	31.58	4	10.6	230	28.3	4.9	x
Ywhaq	14-3-3 protein theta	33.47	5	2.1	188	27.8	4.8	x
Ywhaz	14-3-3 protein zeta/delta	43.27	8	6.6	340	27.8	4.8	x
Rps10	40S ribosomal protein S10	14.55	2		89	18.9	10.2	
Rps12	40S ribosomal protein S12	7.58	1	2.2		14.5	7.2	
Rps14	40S ribosomal protein S14	7.28	1	2.4	46	16.3	10.1	
Rps15a	40S ribosomal protein S15a	39.23	4	4.7	111	14.8	10.1	x
Rps19	40S ribosomal protein S19	27.59	4		102	16.1	10.4	x
Rps20	40S ribosomal protein S20	9.24	1	2.6	52	13.4	9.9	
Rps21	40S ribosomal protein S21	30.12	3	2.4	118	9.1	8.5	x
Rps23	40S ribosomal protein S23	16.08	3	7.4	51	15.8	10.5	
Rps25	40S ribosomal protein S25	14.4	2	2.5	77	13.7	10.1	x
Rps26	40S ribosomal protein S26	7.83	1	2.8	42	13.0	11.0	
Rps28	40S ribosomal protein S28	30.43	2		77	7.8	10.7	x
Rps3	40S ribosomal protein S3	16.05	4	4.7	58	26.7	9.7	x
Rps3a	40S ribosomal protein S3a	14.39	4	9.9	43	29.9	9.7	x
Rps4x	40S ribosomal protein S4, X isoform	3.42	1	2.7	56	29.6	10.2	
Rps7	40S ribosomal protein S7	17.01	2		65	22.1	10.1	
Rpsa	40S ribosomal protein SA	35.93	7	12.3	239	32.8	4.9	x
Sdf4	45 kDa calcium-binding protein	32.69	6	6.5	214	42.0	5.0	x
Hspd1	60 kDa heat shock protein, mitochondrial	38.39	17	41.1	485	60.9	6.2	x
Rplp0	60S acidic ribosomal protein P0	20.19	6	2.5	247	34.2	6.3	x
Rplp1	60S acidic ribosomal protein P1	20.18	2		69	11.5	4.3	x
Rplp2	60S acidic ribosomal protein P2	85.22	5	4.7	125	11.6	4.5	x
Rpl10a	60S ribosomal protein L10a	13.36	3	4.9	58	24.9	10.0	x
Rpl10l	60S ribosomal protein L10-like	5.14	1	2.4		24.5	10.1	

Rpl11	60S ribosomal protein L11	12.92	2	2.3	43	20.2	9.6	
Rpl12	60S ribosomal protein L12	24.24	3	4.9	117	17.8	9.4	x
Rpl22	60S ribosomal protein L22	30.47	3	2.4	98	14.7	9.2	x
Rpl3	60S ribosomal protein L3	10.42	3	2.2	80	46.1	10.2	
Rpl30	60S ribosomal protein L30	15.65	2	2.2	55	12.8	9.6	x
Rpl31	60S ribosomal protein L31	17.6	2	5.0		14.5	10.5	
Rpl4	60S ribosomal protein L4	6.68	2	4.0	67	47.1	11.0	
Rpl5	60S ribosomal protein L5	10.1	3	2.1	68	34.4	9.8	x
Rpl6	60S ribosomal protein L6	2.7	1	2.3		33.5	10.7	
Rpl7a	60S ribosomal protein L7a	9.02	2	2.2	40	30.0	10.6	x
Rpl8	60S ribosomal protein L8	7	2	2.7	41	28.0	11.0	
Rpl9	60S ribosomal protein L9	5.21	1		41	21.9	10.0	
Pgd	6-phosphogluconate dehydrogenase, decarboxylating	22.98	8	4.3	236	53.2	7.2	x
Hspa5	78 kDa glucose-regulated protein	39.24	18	16.9	678	72.4	5.2	x
Anp32a	Acidic leucine-rich nuclear phosphoprotein 32 family member A	17.41	5	9.0	62	28.5	4.1	x
Anp32e	Acidic leucine-rich nuclear phosphoprotein 32 family member E	11.15	2	2.4	45	29.6	3.9	x
Actb	Actin, cytoplasmic 1	39.47	10	8.6	263	41.7	5.5	x
Arpc4	Actin-related protein 2/3 complex subunit 4	13.1	2	4.9	52	19.7	8.4	
Arpc5	Actin-related protein 2/3 complex subunit 5	7.95	1	2.8		16.3	5.7	
Sub1	Activated RNA polymerase II transcriptional coactivator p15	33.07	3		93	14.4	9.6	x
Dbi	Acyl-CoA-binding protein	29.89	2	2.2	45	10.0	8.8	x
Adk	Adenosine kinase	4.71	2	4.5	42	40.1	6.2	
Ahcy	Adenosylhomocysteinase	18.98	7	9.9	169	47.7	6.5	x
Ak2	Adenylate kinase 2, mitochondrial	18.83	4	7.1	57	26.5	7.4	x
Adsl	Adenylosuccinate lyase	7.85	2		69	54.8	7.3	
Akr1a1	Alcohol dehydrogenase [NADP(+)]	16.92	4	8.7	127	36.6	7.4	x
Akr1b1	Aldose reductase	18.67	6	8.9	117	35.7	7.2	x
Alpl	Alkaline phosphatase, tissue-nonspecific isozyme	18.89	8	10.6	192	57.5	7.0	x
Eno1	Alpha-enolase	44.7	15	4.6	707	47.1	6.8	x
Acy1	Aminoacylase-1	4.17	2	4.7		45.8	6.3	x
Asns	Asparagine synthetase [glutamine-hydrolyzing]	6.06	3	2.5	96	64.2	6.6	x
Nars	Asparagine--tRNA ligase, cytoplasmic	4.83	3	2.2	58	64.2	5.9	x
Got1	Aspartate aminotransferase, cytoplasmic	20.34	6	9.3	173	46.2	7.1	x
Got2	Aspartate aminotransferase, mitochondrial	15.35	6	14.7	133	47.4	9.0	x
Atp5b	ATP synthase subunit beta, mitochondrial	17.2	7	7.3	186	56.3	5.3	x
Atp5d	ATP synthase subunit delta, mitochondrial	8.33	1	2.2	56	17.6	5.1	

Ddx39a	ATP-dependent RNA helicase DDX39A	7.49	3	5.0	61	49.0	5.7	x
Banf1	Barrier-to-autointegration factor	13.48	1	2.4	50	10.1	6.1	
Bcap31	B-cell receptor-associated protein 31	4.08	1		41	27.9	8.7	
B2m	Beta-2-microglobulin	18.49	3	6.9	124	13.8	8.4	x
Eno3	Beta-enolase	17.28	3	2.6	301	47.0	7.2	x
Glb1	Beta-galactosidase	12.36	5	2.2	232	73.1	7.5	x
St6gal1	Beta-galactoside alpha-2,6-sialyltransferase 1	9.93	3	2.2	136	46.6	8.9	
Gusb	Beta-glucuronidase	27.01	13	16.2	320	74.1	6.7	x
Atic	Bifunctional purine biosynthesis protein PURH	9.63	5	5.2	124	64.2	6.8	x
Blmh	Bleomycin hydrolase	10.99	3	4.8	131	52.5	6.5	x
Cacybp	Calcyclin-binding protein	13.54	3		85	26.5	7.9	x
Calm1	Calmodulin	57.72	5		185	16.8	4.2	x
Canx	Calnexin	5.58	3		86	67.2	4.6	x
Calr	Calreticulin	21.39	5	6.2	120	48.0	4.5	x
Clstn1	Calsyntenin-1	6.64	5	11.4	142	108.8	4.9	x
Calu	Calumenin	11.43	2		80	37.0	4.7	
Ctsb	Cathepsin B	23.6	6	4.8	352	37.3	5.9	x
Ctsd	Cathepsin D	15.85	5	2.2	121	44.9	7.2	x
Ctse	Cathepsin E	4.53	2	2.0	55	42.9	4.6	
Ctsl	Cathepsin L1	21.86	5	2.9	170	37.5	6.8	x
Ctss	Cathepsin S	17.06	5		156	38.4	7.0	x
Ctsz	Cathepsin Z	15.36	4	7.1	183	34.0	6.6	x
Cd109	CD109 antigen	3.81	5		161	161.6	5.6	
Cd44	CD44 antigen	4.24	2		70	85.6	5.0	
Cbx3	Chromobox protein homolog 3	16.39	2		61	20.8	5.2	x
Copg2	Coatomer subunit gamma-2	1.38	1	2.3		97.6	5.8	
Cfl1	Cofilin-1	35.54	5	2.5	208	18.5	8.1	x
C1qbp	Complement component 1 Q subcomponent-binding protein, mitochondrial	9.71	2		65	31.0	4.9	x
Atox1	Copper transport protein ATOX1	19.12	1	2.3	104	7.3	6.5	
Cst3	Cystatin-C	32.14	6		200	15.5	9.0	x
Creld2	Cysteine-rich with EGF-like domain protein 2	6.29	2	2.2	70	38.2	4.6	x
Cycs	Cytochrome c, somatic	31.43	3	4.9	80	11.6	9.6	x
Lap3	Cytosol aminopeptidase	6.36	3	2.3	136	56.1	7.7	x
Phgdh	D-3-phosphoglycerate dehydrogenase	13.51	7	18.2	202	56.5	6.5	x
Ddt	D-dopachrome decarboxylase	19.49	2		64	13.1	6.5	x
Alad	Delta-aminolevulinic acid dehydratase	21.21	4	4.3	94	36.0	6.8	x

Ctbs	Di-N-acetylchitobiase	4.1	1		41	41.3	5.6	
Dpp3	Dipeptidyl peptidase 3	1.22	1	2.2		82.8	5.4	
Ddb1	DNA damage-binding protein 1	3.51	2	2.3	88	126.8	5.3	x
Apex1	DNA-(apurinic or apyrimidinic site) lyase	18.93	4	2.5	82	35.5	7.9	x
Csda	DNA-binding protein A	8.59	2	2.4	49	38.8	9.7	
Dag1	Dystroglycan	4.7	3	2.3	73	96.8	8.4	x
Eef1a1	Elongation factor 1-alpha 1	25.32	9	28.3	263	50.1	9.0	x
Eef1b	Elongation factor 1-beta	12.44	2	2.4	97	24.7	4.7	
Eef1d	Elongation factor 1-delta	18.51	4	2.4	100	31.3	5.0	x
Eef1g	Elongation factor 1-gamma	13.73	6	9.2	124	50.0	6.7	x
Eef2	Elongation factor 2	23.89	15	20.9	502	95.3	6.8	x
Erap1	Endoplasmic reticulum aminopeptidase 1	25.91	17	23.8	470	106.5	6.2	x
Hsp90b1	Endoplasmin	24.06	13	2.2	453	92.4	4.8	x
Erh	Enhancer of rudimentary homolog	5.77	1		43	12.3	5.9	
Npc2	Epididymal secretory protein E1	12.08	3	4.6	73	16.4	7.7	x
Man2b2	Epididymis-specific alpha-mannosidase	4.62	4	5.0	57	115.5	7.4	x
Eif4a1	Eukaryotic initiation factor 4A-I	24.38	8	7.5	258	46.1	5.5	x
Eif3b	Eukaryotic translation initiation factor 3 subunit B	1.25	1	2.3	42	91.3	5.0	
Eif3i	Eukaryotic translation initiation factor 3 subunit I	13.85	4	10.3	78	36.4	5.6	
Eif4b	Eukaryotic translation initiation factor 4B	1.31	1	2.2		68.8	5.7	
Eif5a	Eukaryotic translation initiation factor 5A-1	33.12	4	11.5	120	16.8	5.2	x
Capza1	F-actin-capping protein subunit alpha-1	11.54	2	4.5	61	32.9	5.6	
Khsrp	Far upstream element-binding protein 2	4.28	3	5.3	95	76.7	7.3	x
Fdps	Farnesyl pyrophosphate synthase	8.22	2		66	40.6	5.7	
Fasn	Fatty acid synthase	5.35	12	19.7	401	272.3	6.6	x
Fabp5	Fatty acid-binding protein, epidermal	14.07	3	6.9	40	15.1	6.5	x
Fth1	Ferritin heavy chain	25.27	4	2.6	140	21.1	5.9	x
Ftl1	Ferritin light chain 1	57.92	8	9.8	292	20.8	6.0	x
Fgf21	Fibroblast growth factor 21	20.95	3	4.8	105	23.2	4.9	x
Aldoa	Fructose-bisphosphate aldolase A	33.52	8	1.9	315	39.3	8.1	x
Fh	Fumarate hydratase, mitochondrial	24.26	7	4.5	252	54.3	9.0	x
Galk1	Galactokinase	6.39	2	2.3	43	42.1	5.3	x
Lgals3bp	Galectin-3-binding protein	22.01	8	7.0	391	64.4	5.1	x
Gm2a	Ganglioside GM2 activator	12.95	3	4.8	63	20.8	5.9	x
G6pdx	Glucose-6-phosphate 1-dehydrogenase X	11.26	6	7.0	128	59.2	6.5	x
Gpi	Glucose-6-phosphate isomerase	27.42	10	12.6	305	62.7	8.1	x

Prkcsh	Glucosidase 2 subunit beta	5.37	3	7.4		58.8	4.5	x
Gsta4	Glutathione S-transferase A4	9.46	2	3.2	81	25.5	7.4	x
Gsto1	Glutathione S-transferase omega-1	14.58	4	16.2	99	27.5	7.4	x
Gstp1	Glutathione S-transferase P 1	20.48	3		145	23.6	7.9	x
Gapdh	Glyceraldehyde-3-phosphate dehydrogenase	32.13	6	2.7	378	35.8	8.3	x
Gars	Glycine--tRNA ligase	1.78	1		44	81.8	6.7	
Grn	Granulins	1.36	1	2.2		63.4	6.8	
Ran	GTP-binding nuclear protein Ran	8.33	1		43	24.4	7.5	
Gnb2l1	Guanine nucleotide-binding protein subunit beta-2-like 1	18.93	4	2.4	178	35.1	7.7	x
H2-D1	H-2 class I histocompatibility antigen, D-B alpha chain	10.22	1	2.3	152	40.8	6.7	
H2-D1	H-2 class I histocompatibility antigen, D-D alpha chain	13.15	4	2.4	114	41.1	6.7	x
H2-D1	H-2 class I histocompatibility antigen, D-K alpha chain	9.12	1	1.9	69	40.6	5.5	
H2-K1	H-2 class I histocompatibility antigen, K-D alpha chain	14.13	4		211	41.5	6.6	x
Hspa4	Heat shock 70 kDa protein 4	21.28	13	9.0	425	94.1	5.2	x
Hspa8	Heat shock cognate 71 kDa protein	40.4	19	14.8	749	70.8	5.5	x
Hsp90aa1	Heat shock protein HSP 90-alpha	31.79	11	12.8	631	84.7	5.0	x
Hsp90ab1	Heat shock protein HSP 90-beta	26.52	9	2.0	504	83.2	5.0	x
Hepacam2	HEPACAM family member 2	2.38	1	2.2		51.4	6.6	
Hnrnpab	Heterogeneous nuclear ribonucleoprotein A/B	28.77	8	4.5	274	30.8	7.9	x
Hnrnpa1	Heterogeneous nuclear ribonucleoprotein A1	20.63	5	4.3	259	34.2	9.2	x
Hnrnpa3	Heterogeneous nuclear ribonucleoprotein A3	20.32	6	9.5	189	39.6	9.0	x
Hnrpdl	Heterogeneous nuclear ribonucleoprotein D-like	2.66	1		40	33.5	7.3	
Hnrnpf	Heterogeneous nuclear ribonucleoprotein F	14.46	4	7.0	151	45.7	5.5	x
Hnrnph1	Heterogeneous nuclear ribonucleoprotein H	6.01	1	2.4	40	49.2	6.3	
Hnrnpk	Heterogeneous nuclear ribonucleoprotein K	18.57	6	12.2	169	50.9	5.5	x
Hnrnpl	Heterogeneous nuclear ribonucleoprotein L	7.17	2	2.6	49	63.9	8.1	
Syncrip	Heterogeneous nuclear ribonucleoprotein Q	4.98	3		78	69.6	8.6	
Hnrnpa2b1	Heterogeneous nuclear ribonucleoproteins A2/B1	24.93	6	4.3	280	37.4	9.0	x
Hnrnpc	Heterogeneous nuclear ribonucleoproteins C1/C2	12.14	3	4.7	60	34.4	5.1	x
Hmgb1	High mobility group protein B1	16.28	3	4.2	52	24.9	5.7	x
Hmgb2	High mobility group protein B2	26.19	3		179	24.1	7.3	x
Hint1	Histidine triad nucleotide-binding protein 1	49.21	3	4.9	129	13.8	6.9	x
Hars	Histidine--tRNA ligase, cytoplasmic	5.89	3	5.0	110	57.4	6.0	
Hist1h1c	Histone H1.2	16.51	6	7.8	140	21.3	11.0	x
Hist1h2ah	Histone H2A type 1-H	32.81	4	11.2	125	13.9	11.0	x
H2afz	Histone H2A.Z	23.44	3	9.9	64	13.5	10.6	x

Hist1h2bf	Histone H2B type 1-F/J/L	27.78	3	2.0	286	13.9	10.3	x
H3f3c	Histone H3.3C	14.71	3	6.5	83	15.3	11.1	x
Hist1h4a	Histone H4	51.46	6	16.0	230	11.4	11.4	x
Rbbp4	Histone-binding protein RBBP4	10.35	4	2.3	80	47.6	4.9	x
N/A	Ig kappa chain C region	49.06	6	2.0	447	11.8	5.4	x
Iap	IgE-binding protein	19.75	9	10.5	306	62.7	9.3	x
Igj	Immunoglobulin J chain	9.43	1		40	18.0	4.9	
Igsf8	Immunoglobulin superfamily member 8	9.82	4	2.2	110	65.0	8.0	
Kpnb1	Importin subunit beta-1	10.27	7	9.7	205	97.1	4.8	x
Ppa1	Inorganic pyrophosphatase	25.26	5	2.3	262	32.6	5.6	x
Impdh2	Inosine-5'-monophosphate dehydrogenase 2	12.06	4	11.3	71	55.8	7.3	x
Igfbp2	Insulin-like growth factor-binding protein 2	2.62	1	2.2		32.8	7.6	
Ifnar2	Interferon alpha/beta receptor 2	1.95	1	2.2	40	56.5	4.6	
Idh1	Isocitrate dehydrogenase [NADP] cytoplasmic	7.25	2		74	46.6	7.2	
Idh2	Isocitrate dehydrogenase [NADP], mitochondrial	5.31	2	4.8	42	50.9	8.7	
Idi1	Isopentenyl-diphosphate Delta-isomerase 1	10.57	2		65	26.3	6.2	
Mfge8	Lactadherin	16.63	7	9.4	134	51.2	6.5	x
Glo1	Lactoylglutathione lyase	21.2	3	2.4	83	20.8	5.5	x
Lmnb1	Lamin-B1	10.88	6	7.8	180	66.7	5.2	x
Lamc1	Laminin subunit gamma-1	9.71	12	14.0	352	177.2	5.2	x
Lgmn	Legumain	28.74	8	5.1	417	49.3	6.4	x
Ldha	L-lactate dehydrogenase A chain	32.53	9	8.7	376	36.5	7.7	x
Acp1	Low molecular weight phosphotyrosine protein phosphatase	5.7	1	2.8	48	18.2	6.7	
Ldlr	Low-density lipoprotein receptor	4.28	2	3.8	87	95.1	5.1	
Ly86	Lymphocyte antigen 86	9.26	2	2.3	62	17.8	5.2	x
Gaa	Lysosomal alpha-glucosidase	10.6	8	9.4	159	106.2	5.8	x
Man2b1	Lysosomal alpha-mannosidase	6.52	6	4.9	199	114.6	8.1	x
Ctsa	Lysosomal protective protein	14.35	6	2.4	191	53.8	5.9	x
Prcp	Lysosomal Pro-X carboxypeptidase	7.54	3	2.3	65	55.0	6.8	x
Dcps	m7GpppX diphosphatase	3.25	1	2.4	48	39.0	6.5	
Mif	Macrophage migration inhibitory factor	33.91	3	2.0	143	12.5	7.3	x
Mdh1	Malate dehydrogenase, cytoplasmic	21.86	5	13.5	144	36.5	6.6	x
Mdh2	Malate dehydrogenase, mitochondrial	36.98	9	16.7	205	35.6	8.7	x
Man1a1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	20.76	8	11.2	240	73.2	6.8	x
Timm13	Mitochondrial import inner membrane translocase subunit Tim13	25.26	2	2.3	93	10.5	8.2	
Msn	Moesin	18.54	10	13.8	330	67.7	6.6	x

Myl6	Myosin light polypeptide 6	14.57	2	5.1	40	16.9	4.7	
Galns	N-acetylgalactosamine-6-sulfatase	9.62	4	4.5	97	57.6	6.5	x
Lsm8	N-alpha-acetyltransferase 38, NatC auxiliary subunit	52.08	3		148	10.4	4.5	
Naca	Nascent polypeptide-associated complex subunit alpha	26.51	4		175	23.4	4.6	x
Ganab	Neutral alpha-glucosidase AB	4.45	4	9.4		106.8	6.1	x
Ncstn	Nicastrin	10.31	5	15.5	160	78.4	6.1	x
Nid2	Nidogen-2	15.89	14	22.3	398	153.8	5.4	x
Nsfl1c	NSFL1 cofactor p47	10.81	3	2.6	86	40.7	5.2	x
Nasp	Nuclear autoantigenic sperm protein	2.59	2	2.2	47	83.9	4.4	x
Nudc	Nuclear migration protein nudC	16.87	5	4.8	149	38.3	5.3	x
Ybx1	Nuclease-sensitive element-binding protein 1	20.19	3	2.4	117	35.7	9.9	x
Nucb1	Nucleobindin-1	38.78	14	5.2	458	53.4	5.1	x
Ncl	Nucleolin	24.47	15	6.4	481	76.7	4.8	x
Npm1	Nucleophosmin	37.33	8	14.2	279	32.5	4.8	x
Nme1	Nucleoside diphosphate kinase A	46.05	3	2.2	136	17.2	7.4	x
Nme2	Nucleoside diphosphate kinase B	55.26	4	7.0	275	17.4	7.5	x
Nap1l1	Nucleosome assembly protein 1-like 1	2.81	1		41	45.3	4.5	
Nudcd2	NudC domain-containing protein 2	5.73	1	2.3		17.6	5.1	
Ola1	Obg-like ATPase 1	6.57	2	5.0		44.7	7.8	x
Olfml3	Olfactomedin-like protein 3	24.63	10	11.9	251	45.7	6.2	x
Ppt1	Palmitoyl-protein thioesterase 1	18.63	4		143	34.5	8.0	x
Ppia	Peptidyl-prolyl cis-trans isomerase A	45.12	7	7.2	272	18.0	7.9	x
Ppib	Peptidyl-prolyl cis-trans isomerase B	42.13	9	12.2	344	23.7	9.6	x
Fkbp1a	Peptidyl-prolyl cis-trans isomerase FKBP1A	25	2		68	11.9	8.2	x
Fkbp4	Peptidyl-prolyl cis-trans isomerase FKBP4	12.01	4	6.3	114	51.5	5.7	
Prdx1	Peroxiredoxin-1	36.68	7	2.1	154	22.2	8.1	x
Prdx2	Peroxiredoxin-2	26.77	5	14.3	214	21.8	5.4	x
Prdx4	Peroxiredoxin-4	24.82	4	4.2	172	31.0	7.2	x
Prdx6	Peroxiredoxin-6	25	4	1.9	111	24.9	6.0	x
Pebp1	Phosphatidylethanolamine-binding protein 1	36.9	6	4.3	257	20.8	5.4	x
Pgk1	Phosphoglycerate kinase 1	42.21	13	16.4	417	44.5	7.9	x
Pgam1	Phosphoglycerate mutase 1	20.08	4	4.8	174	28.8	7.2	x
Pgam2	Phosphoglycerate mutase 2	21.74	3	2.4	113	28.8	8.5	x
Psat1	Phosphoserine aminotransferase	19.19	7	4.9	157	40.4	8.0	x
Psph	Phosphoserine phosphatase	7.56	2	4.6		25.1	6.1	x
Mzb1	Plasma cell-induced resident endoplasmic reticulum protein	19.68	3		71	20.6	6.0	x

Serbp1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2		76	44.7	8.5	
Lcp1	Plastin-2	14.51	7	12.2	240	70.1	5.3	x
Pafah1b2	Platelet-activating factor acetylhydrolase IB subunit beta	3.93	1	2.6	46	25.6	5.9	
Pafah1b3	Platelet-activating factor acetylhydrolase IB subunit gamma	21.12	4	9.5	132	25.8	6.9	x
Pcbp1	Poly(rC)-binding protein 1	17.98	3	3.8	145	37.5	7.1	x
Pabpc1	Polyadenylate-binding protein 1	15.09	8	13.6	196	70.6	9.5	x
Ptbp3	Polypyrimidine tract-binding protein 3	1.53	1	2.2	66	56.7	9.1	
Ubb	Polyubiquitin-B	32.79	2	2.6	44	34.3	7.5	
Pfdn2	Prefoldin subunit 2	5.84	1	2.4	42	16.5	6.6	
Pfn1	Profilin-1	32.86	4	7.2	163	14.9	8.3	x
Pcna	Proliferating cell nuclear antigen	22.61	5	2.2	154	28.8	4.8	x
Pa2g4	Proliferation-associated protein 2G4	17.77	6	2.3	150	43.7	6.9	x
Prep	Prolyl endopeptidase	5.07	3	2.2	73	80.7	5.7	x
Psme1	Proteasome activator complex subunit 1	16.87	4	7.2	86	28.7	6.0	x
Psme2	Proteasome activator complex subunit 2	24.69	4	3.0	130	27.0	5.8	x
Psma1	Proteasome subunit alpha type-1	20.15	5	12.7	68	29.5	6.5	x
Psma2	Proteasome subunit alpha type-2	37.18	6	10.1	98	25.9	7.4	x
Psma3	Proteasome subunit alpha type-3	20.78	5	5.0	111	28.4	5.4	x
Psma4	Proteasome subunit alpha type-4	9.96	3	7.0	67	29.5	7.7	x
Psma5	Proteasome subunit alpha type-5	29.05	5	4.4	179	26.4	4.8	x
Psma6	Proteasome subunit alpha type-6	21.54	4	4.6	175	27.4	6.8	x
Psma7	Proteasome subunit alpha type-7	34.27	7	11.9	207	27.8	8.5	x
Psmb1	Proteasome subunit beta type-1	35.42	6	6.0	205	26.4	7.8	x
Psmb2	Proteasome subunit beta type-2	24.38	4	2.4	108	22.9	7.0	x
Psmb3	Proteasome subunit beta type-3	30.73	4	2.3	215	22.9	6.6	x
Psmb4	Proteasome subunit beta type-4	27.65	5	2.4	156	29.1	5.6	x
Psmb5	Proteasome subunit beta type-5	26.52	6	2.2	177	28.5	7.0	x
Psmb6	Proteasome subunit beta type-6	8.82	2	2.4	71	25.4	5.1	x
Psmb7	Proteasome subunit beta type-7	28.52	6	9.2	144	29.9	8.0	x
Prmt1	Protein arginine N-methyltransferase 1	2.96	1		40	42.4	5.4	
Cnpy2	Protein canopy homolog 2	15.38	2		86	20.8	5.1	
Cdv3	Protein CDV3	10.68	1	3.8	87	29.7	6.1	
Creg1	Protein CREG1	17.27	3		89	24.4	6.4	x
P4hb	Protein disulfide-isomerase	29.08	10	7.1	277	57.0	4.9	x
Pdia3	Protein disulfide-isomerase A3	23.96	11	12.5	300	56.6	6.2	x
Pdia4	Protein disulfide-isomerase A4	9.72	5		143	71.9	5.3	x

Pdia6	Protein disulfide-isomerase A6	27.73	8	3.4	312	48.1	5.1	x
Park7	Protein DJ-1	13.23	4	6.8	68	20.0	6.8	x
Dpy30	Protein dpy-30 homolog	36.36	2	4.4	62	11.2	4.9	x
Ppp1r7	Protein phosphatase 1 regulatory subunit 7	2.77	1	2.2		41.3	4.9	
Rcc2	Protein RCC2	8.85	4	7.0	42	55.9	8.7	x
Set	Protein SET	33.91	6	12.4	100	33.4	4.3	x
Ptma	Prothymosin alpha	25.23	5		450	12.2	3.8	x
Plbd2	Putative phospholipase B-like 2	3.2	2	4.5	42	66.2	6.1	
Rbm3	Putative RNA-binding protein 3	54.25	5	4.0	209	16.6	7.5	x
Pkm	Pyruvate kinase isozymes M1/M2	46.52	21	21.6	689	57.8	7.5	x
Gdi2	Rab GDP dissociation inhibitor beta	40	12	21.9	454	50.5	6.3	x
Ranbp1	Ran-specific GTPase-activating protein	10.84	2	2.6	45	23.6	5.2	
Scpep1	Retinoid-inducible serine carboxypeptidase	19.69	6	4.5	194	50.9	5.7	x
Arhgdia	Rho GDP-dissociation inhibitor 1	28.92	4		126	23.4	5.2	x
Rnaset2	Ribonuclease T2	9.65	2	2.3	46	29.6	6.4	x
Hrsp12	Ribonuclease UK114	21.48	2		64	14.2	8.7	
Rpia	Ribose-5-phosphate isomerase	13.53	3	2.3	134	32.4	8.0	x
Sema4b	Semaphorin-4B	0.85	1		43	91.3	8.2	
Srgn	Serglycin	28.95	2		73	16.7	4.4	
Shmt1	Serine hydroxymethyltransferase, cytosolic	4.81	2	2.2	67	52.6	7.0	x
Srsf2	Serine/arginine-rich splicing factor 2	11.31	2	2.2	90	25.5	11.9	x
Ppp1cc	Serine/threonine-protein phosphatase PP1-gamma catalytic subunit	2.79	1		48	37.0	6.5	
Sars	Serine--tRNA ligase, cytoplasmic	1.95	1		42	58.4	6.3	
Sh3bgrl3	SH3 domain-binding glutamic acid-rich-like protein 3	10.75	1		40	10.5	5.1	
Neu1	Sialidase-1	9.29	4	7.6	66	44.6	6.0	x
Snrpf	Small nuclear ribonucleoprotein F	15.12	1		40	9.7	4.7	
Snrpd3	Small nuclear ribonucleoprotein Sm D3	7.94	1	2.5	42	13.9	10.3	
Sumo2	Small ubiquitin-related modifier 2	23.16	2	2.2	58	10.9	5.5	x
Srm	Spermidine synthase	14.9	3	9.8	56	34.0	5.5	x
Ddx39b	Spliceosome RNA helicase Ddx39b	11.21	4	10.3	85	49.0	5.7	x
U2af2	Splicing factor U2AF 65 kDa subunit	12.42	3	2.4	76	53.5	9.1	x
Stip1	Stress-induced-phosphoprotein 1	9.39	5	4.9	120	62.5	6.8	x
Psap	Sulfated glycoprotein 1	8.44	4	2.0	131	61.4	5.2	x
Qsox1	Sulfhydryl oxidase 1	10.43	7	11.7	200	82.7	7.2	x
Sod1	Superoxide dismutase [Cu-Zn]	37.01	5	4.6	132	15.9	6.5	x
Sod2	Superoxide dismutase [Mn], mitochondrial	4.05	1	2.5	45	24.6	8.6	

Tcp1	T-complex protein 1 subunit alpha	15.11	7	17.6	166	60.4	6.2	x
Cct2	T-complex protein 1 subunit beta	33.83	11	17.7	491	57.4	6.4	x
Cct4	T-complex protein 1 subunit delta	8.35	4	5.0	136	58.0	8.0	x
Cct5	T-complex protein 1 subunit epsilon	20.89	7	10.3	244	59.6	6.0	x
Cct7	T-complex protein 1 subunit eta	11.58	5	2.1	132	59.6	7.8	x
Cct3	T-complex protein 1 subunit gamma	18.17	7	9.7	166	60.6	6.7	x
Cct8	T-complex protein 1 subunit theta	23.91	12	14.9	325	59.5	5.6	x
Cct6a	T-complex protein 1 subunit zeta	16.76	6	13.4	110	58.0	7.1	x
Thop1	Thimet oligopeptidase	1.31	1	2.2	49	78.0	6.1	
Txn	Thioredoxin	20.95	2	2.2	125	11.7	4.9	x
Txndc5	Thioredoxin domain-containing protein 5	4.8	2	2.6	42	46.4	5.8	
Prdx3	Thioredoxin-dependent peroxide reductase, mitochondrial	8.95	2	2.4	41	28.1	7.6	
Txnl1	Thioredoxin-like protein 1	9.69	3		92	32.2	5.0	
Tars	Threonine--tRNA ligase, cytoplasmic	6.37	4	2.3	111	83.3	7.4	x
Taldo1	Transaldolase	11.87	4	2.2	88	37.4	7.0	x
Tfrc	Transferrin receptor protein 1	11.8	8	16.9	176	85.7	6.6	x
Tagln2	Transgelin-2	38.19	6	2.2	257	22.4	8.2	x
Vcp	Transitional endoplasmic reticulum ATPase	23.33	15	20.3	376	89.3	5.3	x
Tkt	Transketolase	36.28	16	32.0	500	67.6	7.5	x
Tpt1	Translationally-controlled tumor protein	48.84	4	7.9	135	19.4	4.9	x
Tpi1	Triosephosphate isomerase	25.42	7	4.6	278	32.2	5.7	x
Tpp1	Tripeptidyl-peptidase 1	6.94	3	2.4	137	61.3	6.6	x
Tpp2	Tripeptidyl-peptidase 2	3.96	5	9.7	84	139.8	6.6	x
Tpm3	Tropomyosin alpha-3 chain	15.85	4	7.4	100	32.8	4.7	x
Tuba1c	Tubulin alpha-1C chain	27.62	9	14.2	256	49.9	5.1	x
Tubb4a	Tubulin beta-4A chain	25.68	6	9.4	256	49.6	4.9	x
Tubb4b	Tubulin beta-4B chain	26.52	8	6.8	181	49.8	4.9	x
Tubb5	Tubulin beta-5 chain	26.8	4	8.8	335	49.6	4.9	x
Twsg1	Twisted gastrulation protein homolog 1	6.76	1		44	24.8	5.5	
Yars	Tyrosine--tRNA ligase, cytoplasmic	9.09	5	9.6	107	59.1	7.0	x
Lsm3	U6 snRNA-associated Sm-like protein LSm3	20.59	2	4.7	44	11.8	4.7	
Uchl3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	12.61	2	2.9	58	26.1	5.1	
Ube2k	Ubiquitin-conjugating enzyme E2 K	23.5	3	2.3	67	22.4	5.4	
Ube2l3	Ubiquitin-conjugating enzyme E2 L3	24.03	2	3.8	69	17.9	8.5	
Ube2n	Ubiquitin-conjugating enzyme E2 N	17.11	2	2.8	51	17.1	6.6	
Ube2v2	Ubiquitin-conjugating enzyme E2 variant 2	18.62	3	4.7	58	16.4	8.1	x

Cmpk1	UMP-CMP kinase	26.53	4	2.4	95	22.2	5.8	x
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	2.4	41	18.0	6.8	x
Rad23b	UV excision repair protein RAD23 homolog B	4.57	2	5.0	50	43.5	4.8	
Vars	Valine--tRNA ligase	6.89	7	4.6	207	140.1	7.8	x
Vapb	Vesicle-associated membrane protein-associated protein B	4.94	1	2.2	47	26.9	7.8	
Lman2	Vesicular integral-membrane protein VIP36	23.46	6	5.3	140	40.4	7.0	x
Atp6ap1	V-type proton ATPase subunit S1	15.12	5	2.8	196	51.0	5.9	x
Pepd	Xaa-Pro dipeptidase	2.03	1	2.3	55	55.0	5.8	

Table 3.1.11: HCPs from Hybridoma cell culture supernatant identified with one or more peptides as being unique to the 37˚C culture.

Gene Symbol	Description	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
Bpnt1	3'(2'),5'-bisphosphate nucleotidase 1	3.57	1		44	33.2	5.8
Rps16	40S ribosomal protein S16	15.07	2	4.9		16.4	10.2
Rps17	40S ribosomal protein S17	14.07	2	2.3	42	15.5	9.9
Slc3a2	4F2 cell-surface antigen heavy chain	5.13	2	5.0	90	58.3	5.9
Rpl13	60S ribosomal protein L13	5.21	1	2.7	51	24.3	11.6
Rpl24	60S ribosomal protein L24	5.1	1	4.7	45	17.8	11.3
Rpl27a	60S ribosomal protein L27a	7.43	1	2.3	45	16.6	11.1
Rpl7	60S ribosomal protein L7	4.07	1	4.8	77	31.4	10.9
Pgls	6-phosphogluconolactonase	8.95	1		44	27.2	5.9
Arpc3	Actin-related protein 2/3 complex subunit 3	9.55	2	2.4	66	20.5	8.6
Actr3	Actin-related protein 3	2.87	1	2.2		47.3	5.9
Agrn	Agrin	3.23	5	5.4	147	207.4	6.3
Adh5	Alcohol dehydrogenase class-3	7.49	1	3.9	66	39.5	7.3
Actn1	Alpha-actinin-1	2.47	2	3.0	79	103	5.4
Man2a1	Alpha-mannosidase 2	3.13	3	4.5	70	131.5	8.0
Naga	Alpha-N-acetylgalactosaminidase	12.05	4	4.5	70	47.2	6.4
Dnpep	Aspartyl aminopeptidase	2.11	1	2.3		52.2	7.3
Hspg2	Basement membrane-specific heparan sulfate proteoglycan core protein	0.81	3	4.4	57	398	6.3
Manba	Beta-mannosidase	1.59	1		45	100.8	7.3
Caprin1	Caprin-1	1.56	1	2.3	48	78.1	5.3
Clic4	Chloride intracellular channel protein 4	4.74	1		41	28.7	5.6
Cs	Citrate synthase, mitochondrial	5.82	2	2.6	79	51.7	8.6
Clta	Clathrin light chain A	3.83	1	2.2	43	25.6	4.6
Cand1	Cullin-associated NEDD8-dissociated protein 1	3.17	3		121	136.2	5.8
Qdpr	Dihydropteridine reductase	7.47	1	3.3	61	25.6	7.8
Dpp7	Dipeptidyl peptidase 2	1.98	1	2.3	67	56.2	5.4
Adam10	Disintegrin and metalloproteinase domain-containing protein 10	2.14	1		43	83.9	7.9
Dynll1	Dynein light chain 1, cytoplasmic	12.36	1		43	10.4	7.4
Erp29	Endoplasmic reticulum resident protein 29	9.16	2		92	28.8	6.2
Ero1lb	ERO1-like protein beta	4.93	2	2.3	43	53.5	8.1
Etf1	Eukaryotic peptide chain release factor subunit 1	2.29	1	2.2		49	5.7
Eif2s1	Eukaryotic translation initiation factor 2 subunit 1	9.21	2		102	36.1	5.1

Eif5a2	Eukaryotic translation initiation factor 5A-2	12.42	2		116	16.8	5.6
Cse1l	Exportin-2	2.78	2	5.2	66	110.4	5.8
Ezr	Ezrin	8.87	1	8.6	196	69.4	6.1
Fubp1	Far upstream element-binding protein 1	1.38	1	2.4		68.5	7.9
G6pd2	Glucose-6-phosphate 1-dehydrogenase 2	3.51	2	2.3	48	59.1	6.8
Glod4	Glyoxalase domain-containing protein 4	4.03	1		44	33.3	5.5
Grhpr	Glyoxylate reductase/hydroxypyruvate reductase	7.01	2	7.7		35.3	7.7
Ipo5	Importin-5	2.64	2		70	123.5	4.9
Isyna1	Inositol-3-phosphate synthase 1	5.75	4	2.5	99	60.9	6.4
Itm2b	Integral membrane protein 2B	16.54	2		58	30.2	5.3
Ssb	Lupus La protein homolog	5.06	2	5.2	75	47.7	9.8
Ggta1	N-acetyllactosaminide alpha-1,3-galactosyltransferase	2.03	1		45	46.4	6.5
Napsa	Napsin-A	3.82	1		60	45.5	7.5
Slc1a5	Neutral amino acid transporter B(0)	4.88	2		100	58.4	7.8
Sil1	Nucleotide exchange factor SIL1	12.69	5	7.5	120	52.4	5.3
Pfas	Phosphoribosylformylglycinamidine synthase	0.9	1		45	144.5	5.7
Ptbp1	Polypyrimidine tract-binding protein 1	7.59	4		189	56.4	8.3
Lmna	Prelamin-A/C	6.47	4	5.1	137	74.2	7.0
Hars2	Probable histidine--tRNA ligase, mitochondrial	1.98	1	2.3		56.9	8.3
Plod1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	3.71	2	2.4	46	83.5	6.5
Plod3	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	6.75	4	3.0	155	84.9	6.2
Timm8a2	Putative mitochondrial import inner membrane translocase subunit Tim8 A-B	11.34	1		41	11.3	6.5
G3bp1	Ras GTPase-activating protein-binding protein 1	3.66	1		54	51.8	5.6
Rap1a	Ras-related protein Rap-1A	12.5	2	2.3	57	21	6.7
Atp6ap2	Renin receptor	10.57	2	5.1	141	39.1	5.5
Rbmxl1	RNA binding motif protein, X-linked-like-1	2.06	1		40	42.1	10.0
Samhd1	SAM domain and HD domain-containing protein 1	2.39	1		47	72.6	8.0
Sarnp	SAP domain-containing ribonucleoprotein	9.05	2	4.9	40	23.5	6.7
Spr	Sepiapterin reductase	5.75	1		42	27.9	5.7
Esd	S-formylglutathione hydrolase	11.7	2	4.9	64	31.3	7.1
Snrpd2	Small nuclear ribonucleoprotein Sm D2	7.63	1	2.5	43	13.5	9.9
Skp1	S-phase kinase-associated protein 1	15.95	2		76	18.7	4.5
Txnrd1	Thioredoxin reductase 1, cytoplasmic	5.55	2	6.7	54	67	7.4
Fuca1	Tissue alpha-L-fucosidase	6.19	2	2.3	87	52.2	7.0
Tcn2	Transcobalamin-2	17.21	5	5.0	114	47.6	6.3
Tcea1	Transcription elongation factor A protein 1	3.32	1	2.2		33.9	8.4

Tceb2	Transcription elongation factor B polypeptide 2	10.17	1		45	13.2	5.0
Btf3	Transcription factor BTF3	16.18	3	4.8	61	22	9.5
Tsn	Translin	4.39	1		40	26.2	6.4
Snrpa	U1 small nuclear ribonucleoprotein A	3.48	1	2.5	75	31.8	9.8
Lsm2	U6 snRNA-associated Sm-like protein LSm2	11.58	1	2.3		10.8	6.5
Usp14	Ubiquitin carboxyl-terminal hydrolase 14	2.23	1	2.3		56	5.2

Table 3.1.12: HCPs from Hybridoma cell culture supernatant identified with one or more peptides as being unique to the 31˚C culture.

Gene Symbol	Description	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
Rps18	40S ribosomal protein S18	7.89	1		43	17.7	11.0
Rps9	40S ribosomal protein S9	9.79	2	4.7	41	22.6	10.7
Rpl18	60S ribosomal protein L18	18.62	3	2.5	97	21.6	11.8
Rpl19	60S ribosomal protein L19	8.67	1		41	23.5	11.5
Rpl23a	60S ribosomal protein L23a	8.33	1		45	17.7	10.5
Rpl26	60S ribosomal protein L26	12.41	2	2.2	69	17.2	10.6
Rpl27	60S ribosomal protein L27	13.97	2		60	15.8	10.6
Rpl38	60S ribosomal protein L38	18.57	1	2.3	60	8.2	10.1
Arpc1b	Actin-related protein 2/3 complex subunit 1B	3.49	1	2.5		41	8.4
Aprt	Adenine phosphoribosyltransferase	7.22	1		42	19.7	6.8
Aars	Alanine--tRNA ligase, cytoplasmic	2.17	2	2.3	52	106.8	5.7
Atp5a1	ATP synthase subunit alpha, mitochondrial	1.81	1		51	59.7	9.2
Arpp19	cAMP-regulated phosphoprotein 19	9.82	1		46	12.3	9.1
Trnt1	CCA tRNA nucleotidyltransferase 1, mitochondrial	2.3	1	2.3		49.9	8.6
Dnase2	Deoxyribonuclease-2-alpha	5.38	1		40	38.8	7.5
Eppk1	Epiplakin	1.51	1	2.5		724.2	6.1
Eif3f	Eukaryotic translation initiation factor 3 subunit F	3.05	1		47	38	5.6
Eif3g	Eukaryotic translation initiation factor 3 subunit G	2.81	1	2.3		35.6	5.9
Eif4h	Eukaryotic translation initiation factor 4H	5.24	1		41	27.3	7.2
Blvrb	Flavin reductase (NADPH)	4.85	1		43	22.2	7.0
Ifi30	Gamma-interferon-inducible lysosomal thiol reductase	13.31	1	4.2		27.8	5.0
Glrx	Glutaredoxin-1	10.28	1	2.3	46	11.9	8.4
Hnrnpu	Heterogeneous nuclear ribonucleoprotein U	5.13	2	2.3	102	87.9	6.2
Igfbp5	Insulin-like growth factor-binding protein 5	4.43	1		40	30.4	8.1
Nptn	Neuroplastin	2.52	1		44	44.3	7.7
Ppid	Peptidyl-prolyl cis-trans isomerase D	2.43	1	2.2		40.7	7.4
Fkbp3	Peptidyl-prolyl cis-trans isomerase FKBP3	4.91	1	2.3	42	25.1	9.3
Pfdn1	Prefoldin subunit 1	9.02	1		55	14.2	8.3
Ptges3	Prostaglandin E synthase 3	5	1		42	18.7	4.6
Psmb9	Proteasome subunit beta type-9	4.57	1	2.5		23.4	5.2
Anp32c	Putative acidic leucine-rich nuclear phosphoprotein 32 family member C	21.95	3	7.5	72	14.1	5.1
Fus	RNA-binding protein FUS	1.74	1		41	52.6	9.4

Ppp2cb	Serine/threonine-protein phosphatase 2A catalytic subunit beta isoform	3.56	1		43	35.6	5.4
Sh3bgrl	SH3 domain-binding glutamic acid-rich-like protein	11.4	1		44	12.8	4.9
Snrpe	Small nuclear ribonucleoprotein E	11.96	1	2.3		10.8	9.4
Stmn1	Stathmin	5.37	1		45	17.3	6.0
Hspa9	Stress-70 protein, mitochondrial	7.36	4	5.4	95	73.4	6.1
Tubb6	Tubulin beta-6 chain	10.07	1	4.8	154	50.1	4.9
Ube2d3	Ubiquitin-conjugating enzyme E2 D3	7.48	1	2.4		16.7	7.8
Ube1ay	Ubiquitin-like modifier-activating enzyme 1 Y	1.13	1	2.2		118	5.6

Table 3.1.13: HCPs from Hybridoma cell culture supernatant identified with two or more peptides as being unique to the 37˚C culture.

Gene Symbol	Description	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
Rps16	40S ribosomal protein S16	15.07	2	4.9		16.4	10.2
Rps17	40S ribosomal protein S17	14.07	2	2.3	42	15.5	9.9
Slc3a2	4F2 cell-surface antigen heavy chain	5.13	2	5.0	90	58.3	5.9
Rpl3	60S ribosomal protein L3	10.42	3	2.2	80	46.1	10.2
Rpl4	60S ribosomal protein L4	6.68	2	4.0	67	47.1	11.0
Rpl8	60S ribosomal protein L8	7	2	2.7	41	28	11.0
Arpc3	Actin-related protein 2/3 complex subunit 3	9.55	2	2.4	66	20.5	8.6
Arpc4	Actin-related protein 2/3 complex subunit 4	13.1	2	4.9	52	19.7	8.4
Adk	Adenosine kinase	4.71	2	4.5	42	40.1	6.2
Adsl	Adenylosuccinate lyase	7.85	2		69	54.8	7.3
Agrn	Agrin	3.23	5	5.4	147	207.4	6.3
Man2a1	Alpha-mannosidase 2	3.13	3	4.5	70	131.5	8.0
Naga	Alpha-N-acetylgalactosaminidase	12.05	4	4.5	70	47.2	6.4
Hspg2	Basement membrane-specific heparan sulfate proteoglycan core protein	0.81	3	4.4	57	398	6.3
St6gal1	Beta-galactoside alpha-2,6-sialyltransferase 1	9.93	3	2.2	136	46.6	8.9
Ctse	Cathepsin E	4.53	2	2.0	55	42.9	4.6
Cd109	CD109 antigen	3.81	5		161	161.6	5.6
Cs	Citrate synthase, mitochondrial	5.82	2	2.6	79	51.7	8.6
Cand1	Cullin-associated NEDD8-dissociated protein 1	3.17	3		121	136.2	5.8
Eef1b	Elongation factor 1-beta	12.44	2	2.4	97	24.7	4.7
Ero1lb	ERO1-like protein beta	4.93	2	2.3	43	53.5	8.1
Eif2s1	Eukaryotic translation initiation factor 2 subunit 1	9.21	2		102	36.1	5.1
Eif5a2	Eukaryotic translation initiation factor 5A-2	12.42	2		116	16.8	5.6
Cse1l	Exportin-2	2.78	2	5.2	66	110.4	5.8
Capza1	F-actin-capping protein subunit alpha-1	11.54	2	4.5	61	32.9	5.6
Fdps	Farnesyl pyrophosphate synthase	8.22	2		66	40.6	5.7
G6pd2	Glucose-6-phosphate 1-dehydrogenase 2	3.51	2	2.3	48	59.1	6.8
Grhpr	Glyoxylate reductase/hydroxypyruvate reductase	7.01	2	7.7		35.3	7.7
Syncrip	Heterogeneous nuclear ribonucleoprotein Q	4.98	3		78	69.6	8.6
Igsf8	Immunoglobulin superfamily member 8	9.82	4	2.2	110	65	8.0
Ipo5	Importin-5	2.64	2		70	123.5	4.9
Isyna1	Inositol-3-phosphate synthase 1	5.75	4	2.5	99	60.9	6.4
Itm2b	Integral membrane protein 2B	16.54	2		58	30.2	5.3
Idh1	Isocitrate dehydrogenase [NADP] cytoplasmic	7.25	2		74	46.6	7.2

Ldlr	Low-density lipoprotein receptor	4.28	2	3.8	87	95.1	5.1
Ssb	Lupus La protein homolog	5.06	2	5.2	75	47.7	9.8
Timm13	Mitochondrial import inner membrane translocase subunit Tim13	25.26	2	2.3	93	10.5	8.2
Myl6	Myosin light polypeptide 6	14.57	2	5.1	40	16.9	4.7
Lsm8	N-alpha-acetyltransferase 38, NatC auxiliary subunit	52.08	3		148	10.4	4.5
Slc1a5	Neutral amino acid transporter B(0)	4.88	2		100	58.4	7.8
Sil1	Nucleotide exchange factor SIL1	12.69	5	7.5	120	52.4	5.3
Fkbp4	Peptidyl-prolyl cis-trans isomerase FKBP4	12.01	4	6.3	114	51.5	5.7
Ptbp1	Polypyrimidine tract-binding protein 1	7.59	4		189	56.4	8.3
Ubb	Polyubiquitin-B	32.79	2	2.6	44	34.3	7.5
Lmna	Prelamin-A/C	6.47	4	5.1	137	74.2	7.0
Plod1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	3.71	2	2.4	46	83.5	6.5
Plod3	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	6.75	4	3.0	155	84.9	6.2
Rap1a	Ras-related protein Rap-1A	12.5	2	2.3	57	21	6.7
Atp6ap2	Renin receptor	10.57	2	5.1	141	39.1	5.5
Sarnp	SAP domain-containing ribonucleoprotein	9.05	2	4.9	40	23.5	6.7
Srgn	Serglycin	28.95	2		73	16.7	4.4
Esd	S-formylglutathione hydrolase	11.7	2	4.9	64	31.3	7.1
Skp1	S-phase kinase-associated protein 1	15.95	2		76	18.7	4.5
Txnrd1	Thioredoxin reductase 1, cytoplasmic	5.55	2	6.7	54	67	7.4
Prdx3	Thioredoxin-dependent peroxide reductase, mitochondrial	8.95	2	2.4	41	28.1	7.6
Tcn2	Transcobalamin-2	17.21	5	5.0	114	47.6	6.3
Btf3	Transcription factor BTF3	16.18	3	4.8	61	22	9.5
Ube2k	Ubiquitin-conjugating enzyme E2 K	23.5	3	2.3	67	22.4	5.4
Rad23b	UV excision repair protein RAD23 homolog B	4.57	2	5.0	50	43.5	4.8

Table 3.1.14: HCPs from Hybridoma cell culture supernatant identified with two or more peptides as being unique to the 31˚C culture.

Gene Symbol	Description	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
Rps10	40S ribosomal protein S10	14.55	2		89	18.9	10.2
Rps23	40S ribosomal protein S23	16.08	3	7.4	51	15.8	10.5
Rps7	40S ribosomal protein S7	17.01	2		65	22.1	10.1
Rpl11	60S ribosomal protein L11	12.92	2	2.3	43	20.2	9.6
Rpl18	60S ribosomal protein L18	18.62	3	2.5	97	21.6	11.8
Rpl26	60S ribosomal protein L26	12.41	2	2.2	69	17.2	10.6
Rpl27	60S ribosomal protein L27	13.97	2		60	15.8	10.6
Calu	Calumenin	11.43	2		80	37	4.7
Cd44	CD44 antigen	4.24	2		70	85.6	5.0
Csda	DNA-binding protein A	8.59	2	2.4	49	38.8	9.7
Eif3i	Eukaryotic translation initiation factor 3 subunit I	13.85	4	10.3	78	36.4	5.6
Hnrnpl	Heterogeneous nuclear ribonucleoprotein L	7.17	2	2.6	49	63.9	8.1
Hnrnpu	Heterogeneous nuclear ribonucleoprotein U	5.13	2	2.3	102	87.9	6.2
Idh2	Isocitrate dehydrogenase [NADP], mitochondrial	5.31	2	4.8	42	50.9	8.7
Idi1	Isopentenyl-diphosphate Delta-isomerase 1	10.57	2		65	26.3	6.2
Serbp1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2		76	44.7	8.5
Cnpy2	Protein canopy homolog 2	15.38	2		86	20.8	5.1
Anp32c	Putative acidic leucine-rich nuclear phosphoprotein 32 family member C	21.95	3	7.5	72	14.1	5.1
Plbd2	Putative phospholipase B-like 2	3.2	2	4.5	42	66.2	6.1
Ranbp1	Ran-specific GTPase-activating protein	10.84	2	2.6	45	23.6	5.2
Hspa9	Stress-70 protein, mitochondrial	7.36	4	5.4	95	73.4	6.1
Txndc5	Thioredoxin domain-containing protein 5	4.8	2	2.6	42	46.4	5.8
Txnl1	Thioredoxin-like protein 1	9	2		96	32.2	5.0
Lsm3	U6 snRNA-associated Sm-like protein LSm3	20.59	2	4.7	44	11.8	4.7
Ube2n	Ubiquitin-conjugating enzyme E2 N	17.11	2	2.8	51	17.1	6.6

Appendix B

Table 3.2.1: List of proteins identified following the LC/MS analysis of Opti-CHO media.

Gene symbol	Description	Σ Coverage	Σ# Peptides
KRT1	Keratin, type II cytoskeletal 1	34.78	24
KRT2	Keratin, type II cytoskeletal 2 epidermal	43.97	22
KRT10	Keratin, type I cytoskeletal 10	35.62	19
KRT9	Keratin, type I cytoskeletal 9	36.76	16
KRT5	Keratin, type II cytoskeletal 5	26.78	14
KRT14	Keratin, type I cytoskeletal 14	31.14	12
KRT6A	Keratin, type II cytoskeletal 6A	23.94	12
KRT16	Keratin, type I cytoskeletal 16	20.51	9
ANXA2P2	Putative annexin A2-like protein	6.19	2

Table 3.2.2: Number of differentially expressed proteins at 24hrs compared to 120hrs at 37˚C in a CHO K1 non-producing cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	24hrs vs 120hrs at 37˚C					
	Total		Up at 120hrs		Down at 120hrs	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	322	112	274	96	48	16
Apoptosis	5	2	5	2	0	0
	GNB2L1, CLU, API5, PDCD6IP, PPM1F	GNB2L1, CLU	GNB2L1,CLU,API5, PDCD6IP,PPM1F	GNB2L1, CLU		
Protease	20	5	14	2	6	3
	DPP7, THOP1, C1ra, Otub1, CTSZ, BMP1, ADAM10, ADAM15, ADAM17, EIF3F, PSMA3, PSMA4, PSMB1, PSMB4, PSMB6, UCHL3, XPNPEP1, ADAMTS1, MMP9, CTSA	DPP7, THOP1, C1ra, Otub1, CTSZ	THOP1, Otub1, BMP1, ADAM10, ADAM15, ADAM17, EIF3F, PSMA3, PSMA4, PSMB1, PSMB4, PSMB6, UCHL3, XPNPEP1	THOP1, Otub1	DPP7, C1ra, CTSZ, ADAMTS1, MMP9, CTSA	DPP7, C1ra, CTSZ
Glycosidase	6	3	2	0	4	3
	MAN2B2, NAGA, GLB1, NEU1, FUCA1, SMPD1	MAN2B2, NAGA, GLB1	NEU1, FUCA1		MAN2B2, NAGA, GLB1, SMPD1	MAN2B2, NAGA, GLB1

Table 3.2.3: List of host cell proteins, the expression of which increased after 120hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
FLNA	Filamin-A	8	8	566	0.0007	3.0
SERPINF1	Pigment epithelium-derived factor	8	8	424	0.0028	6.5
PHGDH	d-3-phosphoglycerate dehydrogenase-like	5	5	374	0.0003	5.6
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	6	6	367	0.0337	1.6
PSAT1	Phosphoserine aminotransferase	6	6	359	0.0059	4.6
VCL	Vinculin	5	5	358	0.0010	2.3
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	5	5	358	0.0022	2.4
PKM	Pyruvate kinase isozymes M1/M2	5	5	345	0.0193	2.7
TPI1	Triosephosphate isomerase	4	4	343	0.0089	4.2
UGDH	UDP-glucose 6-dehydrogenase	4	4	331	0.0087	2.9
SEMA3B	semaphorin-3B	5	5	323	0.0140	8.3
Psap	sulfated glycoprotein 1	5	5	289	0.0126	7.7
TAGLN2	Transgelin-2	4	4	288	0.0013	4.9
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	4	4	248	0.0027	3.2
SBSN	Suprabasin	3	2	243	0.0078	6.0
MDH1	Malate dehydrogenase, cytoplasmic	3	3	232	0.0264	8.1
VIM	vimentin	4	4	215	0.0022	3.4
N/A	Tubulin beta-7 chain	3	3	214	0.0343	1.8
ENO1	alpha-enolase	4	4	214	0.0020	3.9
Akr1b1	Aldose reductase	4	4	213	0.0016	4.3
RPS8	40S ribosomal protein S8	2	2	213	0.0141	2.2
CLU	Clusterin	3	3	212	0.0087	3.3
LMNA	Lamin-A/C	3	3	208	0.0010	4.0
RPSA	40S ribosomal protein SA	3	3	204	0.0248	3.7
ATP6AP2	Renin receptor	4	4	202	0.0027	4.8
KPNB1	Importin subunit beta-1	3	3	201	0.0007	3.1
EEF1D	Elongation factor 1-delta	2	2	191	0.0048	3.9
NCAM1	Neural cell adhesion molecule 1	3	3	191	0.0147	3.5

ADH5	Alcohol dehydrogenase class-3	2	2	189	0.0073	27.8
ACTG1	Actin, cytoplasmic 2	3	3	187	0.0002	2.7
PLTP	phospholipid transfer protein	3	3	185	0.0053	4.8
CCT5	T-complex protein 1 subunit epsilon	3	3	182	0.0052	2.4
NID1**	Nidogen-1	3	3	181	0.0046	150.3
CCT7	T-complex protein 1 subunit eta	2	2	175	0.0053	4.6
THOP1	thimet oligopeptidase-like	3	3	170	0.0009	3.1
HSP90AB1	heat shock protein HSP 90-beta-like	3	3	169	0.0010	2.6
THBS1	thrombospondin-1	3	3	168	0.0142	5.1
AHCY	adenosylhomocysteinase	2	2	168	0.0249	3.0
AHNAK**	Neuroblast differentiation-associated protein AHNAK	3	3	167	0.0052	4.4
CAPG	Macrophage-capping protein	2	2	164	0.0002	3.3
RPL5	60S ribosomal protein L5	3	3	160	0.0094	6.2
BLVRA	Biliverdin reductase A	2	1	156	0.0204	5.2
WDR1	WD repeat-containing protein 1	2	2	155	0.0053	2.6
RAN	GTP-binding nuclear protein Ran	2	2	152	0.0328	4.6
CCT2	T-complex protein 1 subunit beta	2	2	151	0.0288	2.7
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	3	3	150	0.0037	35.8
TCP1	T-complex protein 1 subunit alpha	3	3	150	0.0054	5.7
EEF1G	elongation factor 1-gamma	2	2	149	0.0408	2.8
SFPQ	splicing factor, proline- and glutamine-rich	2	2	147	0.0103	4.0
PABPC1	Polyadenylate-binding protein 1	2	2	143	0.0025	2.1
GLG1	Golgi apparatus protein 1	2	2	143	0.0370	10.4
AKR1A1	Alcohol dehydrogenase (NADP+)	2	2	143	0.0107	2.0
HSP90AA1	heat shock protein HSP 90-alpha	2	2	139	0.0149	2.2
PRDX1	Peroxiredoxin-1	3	3	139	0.0234	3.4
PFDN2	Prefoldin subunit 2	2	2	136	0.0254	2.4
RPIA	Ribose-5-phosphate isomerase	2	2	136	0.0039	2.7
NUCB1	Nucleobindin-1	2	2	135	0.0088	2.2
RPS3	40S ribosomal protein S3	2	2	135	0.0095	2.6
TALDO1	transaldolase	3	3	134	0.0002	4.3
NME1	Nucleoside diphosphate kinase A	2	2	134	0.0159	5.2
RPL12	60S ribosomal protein L12	2	2	133	0.0353	6.1

DDX17*	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	2	1	130	0.0006	4.9
UBA1	Ubiquitin-like modifier-activating enzyme 1	2	2	129	0.0034	2.2
ESD	S-formylglutathione hydrolase	2	2	129	0.0052	3.3
Otub1	Ubiquitin thioesterase OTUB1	2	2	129	0.0024	2.7
RAB1A	Ras-related protein Rab-1A	2	2	125	0.0044	5.8
CAPZB	F-actin-capping protein subunit beta	2	2	123	0.0086	3.4
NUMA1	Nuclear mitotic apparatus protein 1	2	2	123	0.0052	4.8
PAPLN	papilin isoform 1	2	2	123	0.0063	2.7
CBR1	Carbonyl reductase [NADPH] 1	2	2	122	0.0076	2.4
COL5A2	collagen alpha-2(V) chain	2	2	121	0.0028	2.4
N/A	Ddx5-004	2	1	121	0.0177	6.4
IQGAP1	Ras GTPase-activating-like protein IQGAP1	2	2	121	0.0030	3.5
RPS25	40S ribosomal protein S25	2	2	119	0.0316	3.0
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	2	2	119	0.0081	2.9
MSN	moesin	2	2	118	0.0283	2.4
RPS2	40S ribosomal protein S2	2	2	117	0.0193	4.8
PGK1	phosphoglycerate kinase 1	2	2	116	0.0027	2.5
PGM2	phosphoglucomutase-2	2	2	115	0.0052	2.3
LDHA	L-lactate dehydrogenase A chain	2	2	113	0.0384	14.2
YWHAE	14-3-3 protein epsilon	2	2	111	0.0124	1.7
Gstm7	Glutathione S-transferase Mu 7	2	2	109	0.0017	3.6
RPS21	40S ribosomal protein S21	2	2	108	0.0097	4.3
HSP90B1	endoplasmin	2	2	104	0.0008	2.4
ECM1	Extracellular matrix protein 1	2	2	103	0.0040	3.4
VCP	Transitional endoplasmic reticulum ATPase	2	2	103	0.0335	1.8
LGALS3	Galectin-3	2	2	103	0.0094	12.1
EIF3F	Eukaryotic translation initiation factor 3 subunit F	1	1	102	0.0311	2.2
PCBP2	Poly(rC)-binding protein 2	2	2	102	0.0096	6.5
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component-like	2	1	100	0.0181	2.9
YWHAZ	14-3-3 protein zeta/delta	1	1	99	0.0460	2.4
NSFL1C	NSFL1 cofactor p47	1	1	98	0.0043	2.4
VAT1	Synaptic vesicle membrane protein VAT-1 homolog	1	1	97	0.0430	1.8
PGAM1	Phosphoglycerate mutase 1	2	2	96	0.0215	2.7

YWHAQ	14-3-3 protein theta	1	1	95	0.0015	2.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	2	2	95	0.0353	2.1
SH3BGRL2	SH3 domain-binding glutamic acid-rich-like protein	1	1	94	0.0240	1.6
ARSA	arylsulfatase A	2	2	94	0.0024	2.8
H1F0	Histone H1.0	1	1	93	0.0012	5.0
RAB7A	ras-related protein Rab-7a-like	2	2	93	0.0002	8.3
Arf2	ADP-ribosylation factor 2	1	1	93	0.0147	13.2
PCNA	Proliferating cell nuclear antigen	2	2	92	0.0042	1.9
PLEC	Plectin	2	2	90	0.0135	4.7
DPYSL3	Dihydropyrimidinase-related protein 3	1	1	89	0.0376	3.3
PDIA4	protein disulfide-isomerase A4	1	1	88	0.0127	3.8
PSMB6	Proteasome subunit beta type-6	1	1	87	0.0247	2.3
PGM1	Phosphoglucomutase-1	1	1	86	0.0115	2.4
DBN1	Drebrin	1	1	85	0.0120	4.7
SF3B3	Splicing factor 3B subunit 3	1	1	85	0.0181	1.9
EFHD2	EF-hand domain-containing protein D2	1	1	84	0.0253	2.8
UBE2N	Ubiquitin-conjugating enzyme E2 N	1	1	84	0.0157	2.7
PA2G4	Proliferation-associated protein 2G4	1	1	84	0.0156	2.2
GALM	Aldose 1-epimerase	1	1	83	0.0155	1.9
PSPH	Phosphoserine phosphatase	2	2	83	0.0227	2.2
ILF3	Interleukin enhancer-binding factor 3	1	1	83	0.0006	3.5
GOT1	aspartate aminotransferase, cytoplasmic	1	1	83	0.0321	3.0
PSMA4	Proteasome subunit alpha type-4	1	1	83	0.0475	8.1
CCT8	T-complex protein 1 subunit theta	1	1	82	0.0059	2.7
ACTN4	Alpha-actinin-4	1	1	81	0.0051	5.0
CFL2	Cofilin-2	1	1	81	0.0167	3.0
CAPZA2	F-actin-capping protein subunit alpha-2	1	1	80	0.0031	2.4
SERPINB6	Serpin B6	1	1	80	0.0028	4.3
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	1	1	80	0.0149	3.0
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	1	1	79	0.0363	1.9
PFDN1	Prefoldin subunit 1	1	1	78	0.0431	4.7
Ctla2b	protein CTLA-2-beta-like	1	1	77	0.0067	16.8
ACTN1	Alpha-actinin-1	1	1	77	0.0034	4.2

EIF2S3	Eukaryotic translation initiation factor 2 subunit 3	1	1	77	0.0383	2.7
MIF	Macrophage migration inhibitory factor	1	1	76	0.0061	2.9
EEF1B2	Elongation factor 1-beta	1	1	76	0.0025	1.8
CLIC1	Chloride intracellular channel protein 1	1	1	74	0.0266	2.7
AHNAK	Neuroblast differentiation-associated protein AHNAK	1	1	74	0.0333	5.0
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	1	1	73	0.0437	1.9
FSTL1	Follistatin-related protein 1	1	1	72	0.0272	16.9
NASP	Nuclear autoantigenic sperm protein	1	1	71	0.0016	3.8
RPA1	Replication protein A 70 kDa DNA-binding subunit	1	1	69	0.0012	4.4
NEU1	Sialidase-1	1	1	69	0.0170	3.8
TM6SF2	Transmembrane 6 superfamily member 2	1	1	68	0.0025	2.3
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	1	1	68	0.0227	2.4
PNP	Purine nucleoside phosphorylase	1	1	68	0.0190	2.7
FUCA1	tissue alpha-L-fucosidase	1	1	67	0.0294	6.5
DSTN	Destrin	1	1	67	0.0322	2.0
STRAP	Serine-threonine kinase receptor-associated protein	1	1	67	0.0220	1.6
CORO1B	coronin-1B	1	1	67	0.0062	2.7
NHP2L1	NHP2-like protein 1	1	1	67	0.0001	5.4
GSTA3	Glutathione S-transferase alpha-3	1	1	67	0.0028	3.9
RPL14	60S ribosomal protein L14	1	1	66	0.0102	2.0
PFN2	Profilin-2	1	1	65	0.0039	3.2
RPS15A	40S ribosomal protein S15a	1	1	64	0.0317	4.4
QSOX1	Sulfhydryl oxidase 1	1	1	64	0.0491	1.9
PPA1	Inorganic pyrophosphatase	1	1	64	0.0144	12.7
S100A6	protein S100-A6	1	1	64	0.0212	3.2
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	1	1	64	0.0475	1.7
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	1	1	64	0.0251	3.8
RPL7A	60S ribosomal protein L7a	1	1	64	0.0081	4.6
RBM39	RNA-binding protein 39 isoform a	1	1	64	0.0123	3.0
LMNB1	Lamin-B1	1	1	64	0.0349	1.6
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	63	0.0496	2.8
PFN1	Profilin-1	1	1	63	0.0243	1.9
TGFB1	Transforming growth factor beta-1	1	1	63	0.0173	16.5

LTBP1	Latent-transforming growth factor beta-binding protein 1	1	1	62	0.0121	32.4
YWHAB	14-3-3 protein beta/alpha	1	1	62	0.0078	5.2
PDXK	Pyridoxal kinase	1	1	62	0.0027	2.1
RPL15	60S ribosomal protein L15	1	1	62	0.0223	2.8
Rps3a	40S ribosomal protein S3a	1	1	61	0.0006	4.1
N/A	Regulator of differentiation 1	1	1	61	0.0179	2.4
RPS18	40S ribosomal protein S18	1	1	61	0.0013	4.5
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	1	1	61	0.0189	4.7
ABRACL	Costars family protein C6orf115 homolog	1	1	61	0.0158	3.2
PSMD9	26S proteasome non-ATPase regulatory subunit 9	1	1	60	0.0189	2.5
GNAI2	Guanine nucleotide-binding protein G(i) subunit alpha-2	1	1	60	0.0174	2.9
EWSR1	RNA-binding protein EWS	1	1	60	0.0058	3.6
Rps4x	40S ribosomal protein S4	1	1	60	0.0364	2.4
LGALS1	Galectin-1	1	1	59	0.0397	2.3
CDC37	Hsp90 co-chaperone Cdc37	1	1	58	0.0155	2.3
RPL18	60S ribosomal protein L18	1	1	58	0.0201	2.1
PGD	6-phosphogluconate dehydrogenase, decarboxylating	1	1	58	0.0355	3.1
CLSTN1	Calsyntenin-1	1	1	58	0.0182	6.1
SPTAN1	Spectrin alpha chain, brain	1	1	58	0.0204	2.2
SERPINI1	neuroserpin-like	1	1	58	0.0041	6.7
RPL9	60S ribosomal protein L9	1	1	58	0.0366	2.6
HNRPDL	Heterogeneous nuclear ribonucleoprotein D-like	1	1	57	0.0330	6.5
TINAGL1	Tubulointerstitial nephritis antigen-like	1	1	57	0.0008	6.2
RPL29	60S ribosomal protein L29	1	1	57	0.0252	7.6
SIAE	sialate O-acetylesterase-like	1	1	57	0.0461	5.9
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	57	0.0033	5.0
H3F3A	Histone H3.3	1	1	57	0.0093	2.7
G6PD	Glucose-6-phosphate 1-dehydrogenase	1	1	57	0.0025	4.7
SMS	Spermidine synthase	1	1	57	0.0449	13.1
CLTC	Clathrin heavy chain 1	1	1	56	0.0042	5.5
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	1	1	56	0.0407	2.2
LMAN2	Vesicular integral-membrane protein VIP36	1	1	56	0.0044	2.0
RPS23	40S ribosomal protein S23-like	1	1	56	0.0305	2.7

TNXB	Tenascin-X	1	1	55	0.0030	3.6
SNX1	Sorting nexin-1	1	1	55	0.0087	3.3
YWHAH	14-3-3 protein eta	1	1	55	0.0211	3.6
PSMB4	Proteasome subunit beta type-4	1	1	55	0.0183	2.6
CDC42	Cell division control protein 42 homolog	1	1	55	0.0026	13.6
GLOD4	Glyoxalase domain-containing protein 4	1	1	55	0.0140	2.7
GLO1	Lactoylglutathione lyase	1	1	54	0.0188	3.2
SARNP	SAP domain-containing ribonucleoprotein	1	1	54	0.0078	5.1
RPS12	40S ribosomal protein S12	1	1	54	0.0038	17.9
CDNF	Cerebral dopamine neurotrophic factor	1	1	53	0.0474	1.4
RAB11A	Ras-related protein Rab-11A	1	1	53	0.0002	4.1
HSPE1	10 kDa heat shock protein, mitochondrial	1	1	53	0.0025	2.1
API5	Apoptosis inhibitor 5	1	1	53	0.0013	5.2
RPLP0	60S acidic ribosomal protein P0	1	1	53	0.0134	19.4
FASN	Fatty acid synthase	1	1	53	0.0122	3.0
PPM1F	protein phosphatase 1F	1	1	52	0.0007	2.9
PDPK1	3-phosphoinositide-dependent protein kinase 1	1	1	52	0.0376	2.0
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide- alpha-2,3-sialyltransferase 1	1	1	52	0.0089	2.8
UBE2K	Ubiquitin-conjugating enzyme E2 K	1	1	51	0.0072	3.2
RPS14	40S ribosomal protein S14	1	1	51	0.0282	6.8
TSTA3	GDP-L-fucose synthase	1	1	51	0.0026	6.5
CAT	Catalase	1	1	51	0.0103	2.1
PEBP1	Phosphatidylethanolamine-binding protein 1	1	1	51	0.0358	2.5
EIF3L	Eukaryotic translation initiation factor 3 subunit L	1	1	51	0.0396	2.3
PSME2	proteasome activator complex subunit 2-like isoform 1	1	1	51	0.0054	9.3
CCT3	T-complex protein 1 subunit gamma	1	1	51	0.0072	2.0
SEPT9	septin-9	1	1	50	0.0392	1.5
GART	Trifunctional purine biosynthetic protein adenosine-3	1	1	50	0.0121	4.1
RBMX	Heterogeneous nuclear ribonucleoprotein G	1	1	50	0.0161	3.6
HDAC1	Histone deacetylase 1	1	1	50	0.0314	2.8
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	1	1	49	0.0271	3.3
SEMA4B	semaphorin-4B	1	1	49	0.0472	1.9
CCT8	T-complex protein 1 subunit theta	1	1	49	0.0269	3.2

HAPLN1	hyaluronan and proteoglycan link protein 1-like	1	1	48	0.0011	2.3
CNPY2	Protein canopy homolog 2	1	1	48	0.0182	2.5
PSMB1	Proteasome subunit beta type-1	1	1	48	0.0177	2.5
HNRNPU	Heterogeneous nuclear ribonucleoprotein U	1	1	48	0.0344	2.1
PRKCSH	Glucosidase 2 subunit beta	1	1	48	0.0490	2.5
DKK3	Dickkopf-related protein 3	1	1	47	0.0487	8.5
CD109	CD109 antigen isoform 1	1	1	47	0.0077	3.2
NEO1	Neogenin	1	1	47	0.0373	2.5
PLBD2	putative phospholipase B-like 2	1	1	46	0.0099	3.4
DBI	Acyl-CoA-binding protein	1	1	46	0.0098	1.6
KARS	Lysyl-tRNA synthetase	1	1	46	0.0369	2.4
PSMA3	Proteasome subunit alpha type-3	1	1	46	0.0279	2.1
FTH1	Ferritin heavy chain	1	1	46	0.0470	2.1
RPS26	40S ribosomal protein S26	1	1	46	0.0028	3.3
AK2	Adenylate kinase 2, mitochondrial	1	1	46	0.0275	3.6
SND1	Staphylococcal nuclease domain-containing protein 1	1	1	46	0.0395	2.6
STIP1	Stress-induced-phosphoprotein 1	1	1	45	0.0473	10.1
CRIP2	Cysteine-rich protein 2	1	1	45	0.0022	9.9
GPX1	Glutathione peroxidase 1	1	1	45	0.0156	4.8
ANXA1	Annexin A1	1	1	45	0.0117	3.4
RBBP7	Histone-binding protein RBBP7	1	1	45	0.0034	2.9
ST13	Hsc70-interacting protein	1	1	45	0.0212	2.9
EIF3I	Eukaryotic translation initiation factor 3 subunit I	1	1	44	0.0336	2.4
BLVRB	Flavin reductase	1	1	43	0.0040	3.2
TIMM8A	Mitochondrial import inner membrane translocase subunit Tim8 A	1	1	43	0.0457	2.6
CD9	CD9 antigen	1	1	43	0.0021	8.5
GDI2	Rab GDP dissociation inhibitor beta	1	1	43	0.0188	3.5
PDCD6IP	Programmed cell death 6-interacting protein	1	1	43	0.0046	3.4
LOXL3	Lysyl oxidase-like 3	1	1	43	0.0381	6.4
ANXA5	Annexin A5	1	1	43	0.0388	2.5
DCN	Decorin	1	1	42	0.0437	20.2
XPNPEP1	xaa-Pro aminopeptidase 1	1	1	42	0.0083	2.7
MYL6	Myosin light polypeptide 6	1	1	42	0.0069	2.4

HNRNPH2	heterogeneous nuclear ribonucleoprotein H2	1	1	42	0.0311	2.6
SUB1	Activated RNA polymerase II transcriptional coactivator p15	1	1	42	0.0125	2.6
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	1	1	42	0.0045	2.8
CACYBP	Calcyclin-binding protein	1	1	42	0.0450	2.0
RPL10A	60S ribosomal protein L10a	1	1	42	0.0443	3.0
OSTF1	Osteoclast-stimulating factor 1	1	1	42	0.0045	11.3
AARS	Alanyl-tRNA synthetase, cytoplasmic	1	1	41	0.0277	3.6
NCL	nucleolin	1	1	41	0.0100	2.4
HPRT1	Hypoxanthine-guanine phosphoribosyltransferase	1	1	41	0.0432	2.4
RPL19	60S ribosomal protein L19	1	1	41	0.0145	3.8
BMP1	bone morphogenetic protein 1	1	1	41	0.0312	12.5
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	1	1	41	0.0404	3.1
SCP2	non-specific lipid-transfer protein	1	1	40	0.0013	21.9
RNH1	Ribonuclease inhibitor	1	1	40	0.0120	2.7
MYL12B	Myosin regulatory light chain 12B	1	1	40	0.0207	11.4
HEBP1	Heme-binding protein 1	1	1	40	0.0002	12.1

Table 3.2.4: List of host cell proteins, the expression of which decreased after 120hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
DPP7	Dipeptidyl peptidase 2	5	5	324	0.0034	3.3
PROS1	vitamin K-dependent protein S	5	5	266	0.0048	2.9
FN1	Fibronectin	3	3	255	0.0423	1.9
EEF2	elongation factor 2	5	4	249	0.0442	1.6
LAMB1	laminin subunit beta-1	3	3	223	0.0142	2.3
PPT1	Palmitoyl-protein thioesterase 1	3	3	184	0.0011	3.2
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	2	2	182	0.0002	3.3
C1ra	Complement C1r-A subcomponent	3	3	179	0.0044	6.9
CCDC8	coiled-coil domain-containing protein 80-like	3	3	155	0.0169	2.3
EPDR1	Mammalian ependymin-related protein 1	2	2	148	0.0001	7.1
LAMC1	laminin subunit gamma-1	2	2	137	0.0427	1.7
GLB1	Beta-galactosidase	2	2	133	0.0181	1.8
NAGA	Alpha-N-acetylgalactosaminidase	2	2	128	0.0074	2.4
PTX3	pentraxin-related protein PTX3	2	2	127	0.0006	5.0
MAN2B2	Epididymis-specific alpha-mannosidase	2	2	125	0.0023	5.8
CTSZ	Cathepsin Z	2	2	120	0.0056	3.2
MMP9	matrix metalloproteinase-9	1	1	90	0.0168	3.3
COL3A1	collagen alpha-1(III) chain-like isoform 1	1	1	85	0.0412	2.1
SDC4	Syndecan-4	1	1	84	0.0443	8.5
LGALS3BP	Galectin-3-binding protein	1	1	83	0.0279	3.4
PCYOX1	prenylcysteine oxidase	1	1	77	0.0271	7.8
ASPG	Platelet-activating factor acetylhydrolase	1	1	77	0.0006	7.1
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0066	2.6
PRSS35	Inactive serine protease 35	1	1	73	0.0153	3.5
EEF1A1	Elongation factor 1-alpha 1	1	1	66	0.0282	1.2
CYR61	Protein CYR61	1	1	61	0.0164	2.5
CXCL3	C-X-C motif chemokine 3	1	1	60	0.0341	3.1
SMPD1	Sphingomyelin phosphodiesterase	1	1	60	0.0491	2.0
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	58	0.0434	2.2
RPS19	40S ribosomal protein S19	1	1	58	0.0115	3.0

IGSF8	Immunoglobulin superfamily member 8	1	1	58	0.0335	2.8
ACP5	tartrate-resistant acid phosphatase type 5	1	1	58	0.0333	2.2
SEMA3C	Semaphorin-3C	1	1	57	0.0013	2.4
EMILIN1	EMILIN-1	1	1	56	0.0105	1.9
AGRN	agrin-like isoform 1	1	1	55	0.0137	2.7
CTSA	Lysosomal protective protein	1	1	54	0.0279	2.2
CTGF	Connective tissue growth factor	1	1	53	0.0051	14.9
PLOD2	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 2	1	1	52	0.0341	2.5
PXDN	peroxidasin homolog	1	1	50	0.0465	1.4
CSPG4	chondroitin sulfate proteoglycan 4	1	1	50	0.0464	11.6
GNS	N-acetylglucosamine-6-sulfatase	1	1	49	0.0164	3.1
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	1	1	48	0.0426	1.5
RBM3	Putative RNA-binding protein 3	1	1	47	0.0007	4.5
SPARC	SPARC	1	1	47	0.0171	18.3
KDELC2	KDEL motif-containing protein 2	1	1	46	0.0339	4.8
SRPX2	Sushi repeat-containing protein SRPX2	1	1	44	0.0275	1.9
PAM	Peptidyl-glycine alpha-amidating monooxygenase	1	1	44	0.0108	1.3
HSPA13	Heat shock 70 kDa protein 13	1	1	43	0.0201	2.9
COL6A1	Collagen alpha-1(VI) chain	1	1	42	0.0028	5.1
CANT1	soluble calcium-activated nucleotidase 1	1	1	41	0.0264	2.2
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	41	0.0415	21.7

Table 3.2.5: Number of differentially expressed proteins at 24hrs compared to 120hrs at 31˚C in a CHO K1 non-producing cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	24hrs vs 120hrs at 31˚C					
	Total		Up at 120hrs		Down at 120hrs	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	146	38	96	24	50	14
Apoptosis	2	0	0	0	2	0
	APP, Cycs				APP, Cycs	
Protease	8	2	6	1	2	1
	CTSD, C1ra, CTSL1, CTSB, PSMB1, PSMB6, Otub1, ADAMTS7	CTSD, C1ra	CTSD, CTSL1, CTSB, PSMB1, PSMB6, Otub1	CTSD	ADAMTS7, C1ra	C1ra
Glycosidase	6	3	5	2	1	1
	NAGLU, GANAB, NAGA, MAN2B2, GAA, IDUA	NAGLU, GANAB, NAGA	NAGLU, NAGA, MAN2B2, GAA, IDUA	NAGLU, NAGA	GANAB	GANAB

Table 3.2.6: List of host cell proteins, the expression of which increased after 120hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
AHNAK	Neuroblast differentiation-associated protein AHNAK	8	8	474	0.0057	4.1
VCL	Vinculin	5	5	366	0.0022	2.1
CTSD	cathepsin D	3	3	250	0.0040	3.1
SBSN	Suprabasin	3	3	236	0.0122	6.1
VIM	vimentin	4	4	224	0.0146	2.4
EZR	Ezrin	2	1	179	0.0054	2.3
MFGE8	Lactadherin	3	3	172	0.0085	3.0
MSN	moesin	2	1	169	0.0265	2.2
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	2	2	164	0.0070	4.0
NAGLU	alpha-N-acetylglucosaminidase-like	3	3	162	0.0037	6.7
HSP90AA1	heat shock protein HSP 90-alpha	2	1	151	0.0392	2.0
GSTM5	glutathione S-transferase Mu 5-like	2	1	150	0.0027	4.9
CTSL1	cathepsin L1-like	2	1	138	0.0386	2.4
LGALS1	Galectin-1	2	2	136	0.0347	1.8
Gstm7	glutathione S-transferase Mu 7-like	2	1	127	0.0069	2.5
Ctla2b	protein CTLA-2-beta-like	2	2	125	0.0034	8.2
PLTP	phospholipid transfer protein	2	2	123	0.0390	2.7
NAGA	alpha-N-acetylgalactosaminidase-like	2	2	122	0.0256	595.8
Gstm6	Glutathione S-transferase Mu 6	2	1	116	0.0358	3.6
LGALS3	galectin-3-like	2	2	103	0.0132	4.7
PSME2	proteasome activator complex subunit 2-like isoform 1	2	2	101	0.0179	2.0
VCP	Transitional endoplasmic reticulum ATPase	2	2	100	0.0268	1.9
APRT	adenine phosphoribosyltransferase-like	2	2	99	0.0139	3.4
LAMA5	laminin subunit alpha-5 isoform 1	1	1	93	0.0233	1.9
H1F0	histone H1.0-like	1	1	93	0.0092	2.9
RAB7A	ras-related protein Rab-7a-like	2	2	93	0.0031	4.5
ARF1	ADP-ribosylation factor 1-like, partial	1	1	93	0.0384	7.9
TAGLN2	transgelin-2-like	1	1	88	0.0056	2.1
CAST	Calpastatin	1	1	86	0.0271	2.2
CSF1	macrophage colony-stimulating factor 1 isoform 1	1	1	84	0.0188	2.1

ILF3	Interleukin enhancer-binding factor 3	1	1	83	0.0341	1.6
CFL1	cofilin-1	1	1	81	0.0003	1.9
EEF1D	Elongation factor 1-delta	1	1	81	0.0310	1.8
SERPINB6	serpin B6 isoform 1	1	1	80	0.0164	3.4
PHGDH	d-3-phosphoglycerate dehydrogenase-like	1	1	77	0.0222	2.5
FLNA	Filamin-A	1	1	73	0.0018	3.1
NUMA1	Nuclear mitotic apparatus protein 1	1	1	73	0.0093	2.8
SFPQ	splicing factor, proline- and glutamine-rich	1	1	72	0.0004	4.8
ATXN10	Ataxin-10	1	1	72	0.0207	3.4
Otub1	Ubiquitin thioesterase OTUB1	1	1	71	0.0257	2.2
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	71	0.0053	2.5
MYL9	myosin regulatory light polypeptide 9-like	1	1	70	0.0394	1.9
SH3BGRL2	SH3 domain-binding glutamic acid-rich-like protein-like	1	1	69	0.0455	1.8
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	1	1	67	0.0493	2.0
GAA	lysosomal alpha-glucosidase-like	1	1	67	0.0306	2.1
PGK1	phosphoglycerate kinase 1	1	1	67	0.0151	1.6
ANXA8	annexin A8-like	1	1	67	0.0035	10.1
Gsta6	Glutathione S-transferase A6	1	1	67	0.0006	2.4
ESD	S-formylglutathione hydrolase-like	1	1	66	0.0467	3.1
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic-like	1	1	65	0.0145	5.6
PCOLCE2	Procollagen C-endopeptidase enhancer 2	1	1	64	0.0101	2.7
RPS15A	40S ribosomal protein S15a	1	1	64	0.0202	1.9
S100A6	protein S100-A6	1	1	64	0.0365	4.5
COL3A1	collagen alpha-1(III) chain-like isoform 1	1	1	63	0.0034	3.2
PPIA	Peptidyl-prolyl cis-trans isomerase A	1	1	62	0.0309	3.7
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	1	1	61	0.0426	1.9
ECT2L	Epithelial cell transforming sequence 2 oncogene-like	1	1	61	0.0418	2.3
PSMB6	proteasome subunit beta type-6-like	1	1	60	0.0488	1.9
CIRBP	Cold-inducible RNA-binding protein	1	1	60	0.0154	3.5
NCL	nucleolin	1	1	60	0.0083	1.6
GRN	granulins isoform 1	1	1	60	0.0000	5.5
EWSR1	RNA-binding protein EWS	1	1	60	0.0043	6.4
APLP2	Amyloid-like protein 2	1	1	60	0.0287	11.4
LMNA	Lamin-A/C	1	1	59	0.0090	2.7

MDH1	malate dehydrogenase, cytoplasmic-like	1	1	59	0.0064	2.5
ATOX1	copper transport protein ATOX1-like	1	1	58	0.0119	2.4
ANXA2	Annexin A2	1	1	58	0.0311	34.6
RPL9	60S ribosomal protein L9	1	1	58	0.0087	2.0
N/A	hypothetical protein LOC100760484	1	1	57	0.0241	2.6
G6PD	Glucose-6-phosphate 1-dehydrogenase	1	1	57	0.0043	2.0
CACYBP	Calcyclin-binding protein	1	1	55	0.0495	3.7
NUCB2	nucleobindin-2-like	1	1	55	0.0050	Infinity
DDX5	probable ATP-dependent RNA helicase DDX5	1	1	54	0.0215	4.0
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	54	0.0081	Infinity
CTSB	cathepsin B-like	1	1	53	0.0038	2.3
TSTA3	GDP-L-fucose synthase	1	1	51	0.0314	3.4
CCT7	T-complex protein 1 subunit eta	1	1	51	0.0034	3.6
RPS27A	ubiquitin-40S ribosomal protein S27a-like	1	1	49	0.0271	1.9
PSMB1	Proteasome subunit beta type-1	1	1	48	0.0136	1.8
RBM3	Putative RNA-binding protein 3	1	1	47	0.0078	4.2
GPX1	Glutathione peroxidase 1	1	1	45	0.0059	6.7
GLG1	Golgi apparatus protein 1 precursor	1	1	45	0.0342	4.8
ANXA1	annexin A1-like	1	1	45	0.0106	2.4
CCT8	T-complex protein 1 subunit theta	1	1	44	0.0179	3.6
IDUA	Alpha-L-iduronidase	1	1	44	0.0306	2.5
MAN2B2	Epididymis-specific alpha-mannosidase	1	1	44	0.0421	2.8
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	1	1	43	0.0274	2.3
CD9	CD9 antigen	1	1	43	0.0158	4.1
Psap	sulfated glycoprotein 1	1	1	43	0.0477	5.1
MYL6	Myosin light polypeptide 6	1	1	42	0.0292	3.1
HNRNPH2	heterogeneous nuclear ribonucleoprotein H2	1	1	42	0.0238	3.0
TPM3	tropomyosin alpha-3 chain isoform 1	1	1	42	0.0466	1.7
PIR	pirin-like	1	1	41	0.0267	2.1
SCP2	non-specific lipid-transfer protein	1	1	40	0.0325	4.3
N/A	hypothetical protein I79_015376	1	1	40	0.0211	2.0
ENO1	alpha-enolase	1	1	40	0.0063	2.4

Table 3.2.7: List of host cell proteins, the expression of which decreased after 120hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
SEMA3E	semaphorin-3E	3	3	188	0.0028	2.5
PKM	Pyruvate kinase isozymes M1/M2	3	3	187	0.0034	4.8
HSP90AB1	heat shock protein HSP 90-beta-like	3	2	180	0.0008	2.3
C1ra	Complement C1r-A subcomponent	3	3	179	0.0025	4.2
GANAB	neutral alpha-glucosidase AB isoform 1	3	3	179	0.0024	3.2
CSPG4	chondroitin sulfate proteoglycan 4	2	2	156	0.0054	5.8
SEMA3C	Semaphorin-3C	2	2	146	0.0262	2.2
HSP90B1	endoplasmin	2	2	131	0.0190	1.8
PLA2G7	platelet-activating factor acetylhydrolase-like	2	2	128	0.0041	5.4
PTX3	pentraxin-related protein PTX3	2	2	127	0.0140	2.5
SEMA4B	semaphorin-4B	2	2	124	0.0246	3.2
NEO1	Neogenin	2	2	107	0.0284	2.1
HYOU1	Hypoxia up-regulated protein 1	2	2	106	0.0040	3.3
GSTP1	Glutathione S-transferase P	1	1	106	0.0023	12.1
SEMA3B	semaphorin-3B	2	2	99	0.0064	2.4
LGALS3BP	galectin-3-binding protein-like	1	1	89	0.0294	22.4
SDC4	syndecan-4-like	1	1	84	0.0085	13.8
PCYOX1	prenylcysteine oxidase	1	1	77	0.0021	8.9
AGT	Angiotensinogen	1	1	76	0.0182	4.6
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0148	2.7
PRSS35	Inactive serine protease 35	1	1	73	0.0288	1.8
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	1	1	70	0.0031	3.2
GLT25D1	Glycosyltransferase 25 family member 1	1	1	69	0.0305	2.6
PDIA3	Protein disulfide-isomerase A3	1	1	69	0.0174	1.6
TGFB1	Transforming growth factor beta-1	1	1	67	0.0010	1.9
IGSF8	Immunoglobulin superfamily member 8	1	1	64	0.0117	3.0
OAF	Out at first protein-like	1	1	62	0.0015	1.9

PRDX4	peroxiredoxin-4-like	1	1	60	0.0391	2.0
SERPINE1	Plasminogen activator inhibitor 1	1	1	56	0.0408	3.2
EMILIN1	EMILIN-1	1	1	56	0.0011	2.0
TIMP1	metalloproteinase inhibitor 1-like	1	1	54	0.0153	5909.1
CDNF	cerebral dopamine neurotrophic factor-like	1	1	53	0.0044	3.9
CTGF	Connective tissue growth factor	1	1	53	0.0040	20.7
HSPA5	78 kDa glucose-regulated protein	1	1	53	0.0304	1.9
FKBP4	FK506-binding protein 4	1	1	52	0.0487	3.6
TMEM132A	Transmembrane protein 132A	1	1	52	0.0467	2.6
RPL10	60S ribosomal protein L10	1	1	51	0.0294	1.7
D17Wsu104e	UPF0556 protein C19orf10 homolog	1	1	49	0.0083	2.0
YWHAH	14-3-3 protein eta	1	1	49	0.0098	1.7
APP	amyloid beta A4 protein	1	1	49	0.0004	Infinity
FKBP2	peptidyl-prolyl cis-trans isomerase FKBP2-like isoform 1	1	1	49	0.0002	2.1
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2-like	1	1	48	0.0409	1.9
RAN	GTP-binding nuclear protein Ran	1	1	47	0.0007	Infinity
CHST11	carbohydrate sulfotransferase 11	1	1	47	0.0412	3.9
GPC1	Glypican-1	1	1	45	0.0403	275.1
PLEKHG3	Pleckstrin-likey domain-containing family G member 3	1	1	43	0.0030	1.5
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	1	1	43	0.0001	8.6
OLFML2B	olfactomedin-like protein 2B	1	1	41	0.0430	5.8
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	41	0.0106	5.2
Cycs	cytochrome c, somatic-like	1	1	40	0.0262	2.0

Table 3.2.8: Number of differentially expressed proteins between 31˚C and 37˚C at 24hrs post temperature shift in a CHO K1 non-producing cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	37˚C vs 31˚C 24hrs					
	Total		Up at 31˚C		Down at 31˚C	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	211	55	197	52	14	3
Apoptosis	5	0	4	0	1	0
	CLU, API5, GNB2L1, KIAA1967 , PPM1F		API5, GNB2L1, KIAA1967, PPM1F		CLU	
Protease	11	5	7	3	4	2
	CTSH, DPP7, THOP1, UCHL3, Otub1, MMP19, TPP1, CNDP2, DPP3, LTA4H, PREP	CTSH, DPP7, THOP1, UCHL3, Otub1	THOP1, UCHL3, Otub1, CNDP2, DPP3, LTA4H, PREP	THOP1, UCHL3, Otub1	CTSH, DPP7, MMP19, TPP1	CTSH, DPP7
Glycosidase	3	1	1	1	2	0
	GANAB, HEXA, GAA	GANAB	GANAB	GANAB	HEXA, GAA	

Table 3.2.9: List of host cell proteins, the expression of which decreased at 31˚C when compared to 37˚C, 24hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
Psap	sulfated glycoprotein 1	2	2	137	0.0357	4.4
DPP7	Dipeptidyl peptidase 2	2	2	126	0.0105	2.0
CTSH	Cathepsin H	2	2	101	0.0101	1.8
TPP1	Tripeptidyl-peptidase 1	1	1	84	0.0163	13.5
EPDR1	Mammalian ependymin-related protein 1	1	1	79	0.0360	1.8
GAA	Lysosomal alpha-glucosidase	1	1	67	0.0398	1.9
FAM3C	Protein FAM3C	1	1	62	0.0439	17.0
GRN	granulins isoform 1	1	1	60	0.0137	3.6
COL5A2	collagen alpha-2(V) chain	1	1	59	0.0367	1.9
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	1	1	54	0.0002	5.9
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	1	1	48	0.0094	1.7
CLU	Clusterin	1	1	46	0.0485	1.8
MMP19	matrix metalloproteinase-19	1	1	45	0.0213	1.6
HEXA	beta-hexosaminidase subunit alpha	1	1	42	0.0341	1.6

Table 3.2.10: List of host cell proteins, the expression of which increased at 31˚C when compared to 37˚C, 24hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
HSP90B1	endoplasmin	9	8	502	0.0020	4.0
VCL	Vinculin	6	6	427	0.0015	2.1
PDIA3	Protein disulfide-isomerase A3	6	6	426	0.0015	3.8
PDIA6	Protein disulfide-isomerase A6	5	5	418	0.0106	2.9
FLNA	Filamin-A	5	5	399	0.0096	1.9
HSP90AB1	heat shock protein HSP 90-beta-like	6	3	380	0.0011	1.8
PHGDH	d-3-phosphoglycerate dehydrogenase-like	5	5	374	0.0008	3.2
TAGLN2	Transgelin-2	5	5	329	0.0020	3.6
HSPA5	78 kDa glucose-regulated protein	4	3	292	0.0022	3.3
HSPA8	heat shock cognate 71 kDa protein	4	3	274	0.0236	1.9
AKR1A1	Alcohol dehydrogenase (NADP+)	4	4	266	0.0029	2.6
YWHAE	14-3-3 protein epsilon	4	4	260	0.0022	1.8
GANAB	Neutral alpha-glucosidase AB	4	4	254	0.0001	6.3
HIST1H2AG*	Histone H2A type 1	3	3	249	0.0044	2.2
HSP90AA1	heat shock protein HSP 90-alpha	3	1	228	0.0136	1.8
PSAT1	Phosphoserine aminotransferase	3	3	204	0.0058	2.6
UBA1	Ubiquitin-like modifier-activating enzyme 1	3	3	199	0.0193	1.9
NCL	nucleolin	3	3	186	0.0053	1.6
ACTN1	Alpha-actinin-1	3	2	181	0.0031	2.4
VCP	Transitional endoplasmic reticulum ATPase	3	3	175	0.0023	2.9
PRDX4	Peroxiredoxin-4	3	3	169	0.0013	4.4
PABPC1	Polyadenylate-binding protein 1	2	2	168	0.0011	2.0
CAPG	Macrophage-capping protein	2	2	164	0.0002	2.9
GLOD4	Glyoxalase domain-containing protein 4	2	2	161	0.0051	2.2
GALM	Aldose 1-epimerase	2	2	159	0.0056	2.1
ACTN4**	Alpha-actinin-4	2	1	153	0.0122	3.7
VAT1	Synaptic vesicle membrane protein VAT-1-like	2	2	153	0.0080	2.0
PKM	Pyruvate kinase isozymes M1/M2	2	2	149	0.0319	1.5
PFDN2	prefoldin subunit 2-like	2	2	142	0.0018	1.9
RPS3	40S ribosomal protein S3	2	2	135	0.0125	1.7
CAPRIN1	Caprin-1	2	2	134	0.0160	2.4
PFN1	Profilin-1	2	2	134	0.0043	1.9
PA2G4	Proliferation-associated protein 2G4	2	2	134	0.0018	2.3

UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	2	2	132	0.0029	2.2
ILF3	Interleukin enhancer-binding factor 3	2	2	131	0.0117	1.9
Otub1	Ubiquitin thioesterase OTUB1	2	2	129	0.0034	2.2
SET	Protein SET	2	2	127	0.0353	1.8
Gstm6	Glutathione S-transferase Mu 6	2	2	127	0.0280	8.2
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	2	2	125	0.0095	2.1
NUMA1	Nuclear mitotic apparatus protein 1	2	2	123	0.0116	3.1
CBR1	Carbonyl reductase [NADPH] 1	2	2	122	0.0003	2.4
IQGAP1	Ras GTPase-activating-like protein IQGAP1	2	2	121	0.0011	2.5
NACA	Nascent polypeptide-associated complex subunit alpha	1	1	117	0.0288	1.8
PGK1	phosphoglycerate kinase 1	2	2	116	0.0012	2.1
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	2	2	116	0.0011	2.2
MTPN	Myotrophin	1	1	115	0.0496	2.1
Hsc70-4	Heat shock 70 kDa protein 4	2	2	112	0.0221	2.3
HYOU1	Hypoxia up-regulated protein 1	2	2	106	0.0018	4.2
PTGR1	Prostaglandin reductase 1	2	1	105	0.0019	2.0
KPNB1	Importin subunit beta-1	2	2	105	0.0228	2.5
Akr1b1	Aldose reductase	2	2	99	0.0119	2.3
NSFL1C	NSFL1 cofactor p47	1	1	98	0.0083	1.8
ENO1	alpha-enolase	2	2	97	0.0342	2.0
THOP1	thimet oligopeptidase-like	2	2	97	0.0219	1.7
SPTBN1	Spectrin beta chain, brain 1	1	1	97	0.0175	2.1
YWHAQ	14-3-3 protein theta	1	1	95	0.0147	1.8
SH3BGRL2	SH3 domain-binding glutamic acid-rich-like protein	1	1	94	0.0023	1.7
PLS3	Plastin-3	1	1	94	0.0475	1.6
RPIA	Ribose-5-phosphate isomerase	1	1	91	0.0077	2.6
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	1	1	91	0.0269	2.0
PDIA4	protein disulfide-isomerase A4	1	1	88	0.0002	3.1
PGM1	Phosphoglucomutase-1	1	1	86	0.0250	2.9
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	2	2	82	0.0067	7.1
EEF1D	Elongation factor 1-delta	1	1	81	0.0045	1.6
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	1	1	79	0.0197	2.2
TMPO	Lamina-associated polypeptide 2, isoforms alpha/zeta	1	1	78	0.0051	1.8
PFDN1	Prefoldin subunit 1	1	1	78	0.0457	3.0
PCYOX1	prenylcysteine oxidase	1	1	77	0.0020	17.7
MIF	Macrophage migration inhibitory factor	1	1	76	0.0169	2.6
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0030	4.6

CSRP1	Cysteine and glycine-rich protein 1	1	1	75	0.0098	1.7
LGALS3BP	Galectin-3-binding protein	1	1	75	0.0105	1.5
ERP29	Endoplasmic reticulum resident protein 29	1	1	73	0.0054	4.4
NONO	Non-POU domain-containing octamer-binding protein	1	1	73	0.0448	2.0
ELAVL1	ELAV-like protein 1	1	1	72	0.0415	2.2
RPLP0	60S acidic ribosomal protein P0	1	1	72	0.0293	2.0
P4hb	Protein disulfide-isomerase	1	1	72	0.0432	1.9
SND1	Staphylococcal nuclease domain-containing protein 1	1	1	72	0.0055	5.4
ATXN10	Ataxin-10	1	1	72	0.0085	5.0
NASP	Nuclear autoantigenic sperm protein	1	1	71	0.0124	2.5
GLT25D1	Procollagen galactosyltransferase 1	1	1	69	0.0000	9.1
RPA1	Replication protein A 70 kDa DNA-binding subunit	1	1	69	0.0063	2.5
BLVRB	Flavin reductase	1	1	68	0.0176	8.5
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	1	1	68	0.0458	1.7
STRAP	Serine-threonine kinase receptor-associated protein	1	1	67	0.0018	2.2
CORO1B	coronin-1B	1	1	67	0.0123	2.0
NHP2L1	NHP2-like protein 1	1	1	67	0.0003	2.8
GSTA3	Glutathione S-transferase alpha-3	1	1	67	0.0005	3.8
RPL5	60S ribosomal protein L5	1	1	65	0.0322	3.4
PPP1R7	Protein phosphatase 1 regulatory subunit 7	1	1	65	0.0306	3.0
RPL31	60S ribosomal protein L31	1	1	65	0.0484	2.5
EIF4B	Eukaryotic translation initiation factor 4B	1	1	64	0.0307	1.9
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	1	1	64	0.0217	2.6
RBM39	RNA-binding protein 39 isoform a	1	1	64	0.0135	3.2
LMNB1	Lamin-B1	1	1	64	0.0253	1.9
RPS19	40S ribosomal protein S19	1	1	63	0.0163	2.4
HNRNPM	Heterogeneous nuclear ribonucleoprotein M	1	1	63	0.0259	2.3
FDPS	Farnesyl pyrophosphate synthase	1	1	62	0.0306	1.8
MYL6	Myosin light polypeptide 6	1	1	62	0.0148	1.7
AHNAK*	Neuroblast differentiation-associated protein AHNAK	1	1	61	0.0176	3.4
Rps3a	40S ribosomal protein S3a	1	1	61	0.0022	2.2
RPS18	40S ribosomal protein S18	1	1	61	0.0130	3.2
RAD23B	UV excision repair protein RAD23 homolog B	1	1	61	0.0179	2.2
CNDP2	cytosolic non-specific dipeptidase	1	1	60	0.0387	1.5
RPS25	40S ribosomal protein S25	1	1	60	0.0201	2.1
TSC22D1	TSC22 domain family protein 1	1	1	60	0.0353	1.8
GNAI2	Guanine nucleotide-binding protein G(i) subunit alpha-2	1	1	60	0.0222	3.2

EWSR1	RNA-binding protein EWS	1	1	60	0.0099	3.0
EIF4A1	Eukaryotic initiation factor 4A-I	1	1	59	0.0451	2.2
TXNL1	Thioredoxin-like protein 1	1	1	59	0.0201	2.4
RAB1A	Ras-related protein Rab-1A	1	1	59	0.0490	2.8
Gstm7	Glutathione S-transferase Mu 7	1	1	59	0.0101	2.6
GLRX3	Glutaredoxin-3	1	1	59	0.0437	2.1
CDC37	Hsp90 co-chaperone Cdc37	1	1	58	0.0192	2.6
SPTAN1	Spectrin alpha chain, brain	1	1	58	0.0157	2.8
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	57	0.0079	3.0
G6PD	Glucose-6-phosphate 1-dehydrogenase	1	1	57	0.0093	2.9
EEF2	elongation factor 2	1	1	57	0.0404	2.1
CLTC	Clathrin heavy chain 1	1	1	56	0.0142	2.1
LMAN2	Vesicular integral-membrane protein VIP36	1	1	56	0.0023	2.4
SNX1	Sorting nexin-1	1	1	55	0.0112	4.0
PSMD4	26S proteasome non-ATPase regulatory subunit 4	1	1	55	0.0364	2.2
LTA4H	leukotriene A-4 hydrolase	1	1	54	0.0425	2.3
TBCA	Tubulin-specific chaperone A	1	1	54	0.0110	2.9
RPS21	40S ribosomal protein S21	1	1	53	0.0111	3.4
RAB11A	Ras-related protein Rab-11A	1	1	53	0.0060	2.7
HSPE1	10 kDa heat shock protein, mitochondrial	1	1	53	0.0209	2.7
API5	Apoptosis inhibitor 5	1	1	53	0.0177	2.2
SERPINF1	Pigment epithelium-derived factor	1	1	53	0.0005	2.2
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	1	1	53	0.0436	2.1
ACTG1	Actin, cytoplasmic 2	1	1	53	0.0284	3.1
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	1	1	52	0.0477	5.9
PPM1F	protein phosphatase 1F	1	1	52	0.0033	2.9
IDI1	Isopentenyl-diphosphate Delta-isomerase 1	1	1	52	0.0468	2.3
PPA1	Inorganic pyrophosphatase	1	1	52	0.0244	1.9
PRDX6	Peroxiredoxin-6	1	1	52	0.0396	1.9
UBE2K	Ubiquitin-conjugating enzyme E2 K	1	1	51	0.0293	2.2
PGM2	phosphoglucomutase-2	1	1	51	0.0057	2.2
NME2	Nucleoside diphosphate kinase B	1	1	51	0.0089	1.9
TSTA3	GDP-L-fucose synthase	1	1	51	0.0016	9.1
CAT	Catalase	1	1	51	0.0192	2.2
ATIC	bifunctional purine biosynthesis protein PURH	1	1	51	0.0194	2.8
YBX1	Nuclease-sensitive element-binding protein 1	1	1	51	0.0457	2.5
PSME2	proteasome activator complex subunit 2-like isoform 1	1	1	51	0.0256	2.9

RPS6	40S ribosomal protein S6	1	1	51	0.0337	2.6
RPL7A	60S ribosomal protein L7a	1	1	51	0.0167	3.0
RPL27	60S ribosomal protein L27	1	1	50	0.0036	2.7
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	1	1	50	0.0441	1.7
RBMX	Heterogeneous nuclear ribonucleoprotein G	1	1	50	0.0414	2.7
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component-like	1	1	50	0.0063	1.7
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	1	1	49	0.0365	2.3
CMPK1	UMP-CMP kinase	1	1	49	0.0485	3.8
PREP	Prolyl endopeptidase	1	1	49	0.0121	1.8
D17Wsu104e	UPF0556 protein C19orf10 homolog	1	1	49	0.0005	3.8
MCM7	DNA replication licensing factor MCM7	1	1	49	0.0327	1.9
FKBP2	Peptidyl-prolyl cis-trans isomerase FKBP2	1	1	49	0.0118	3.5
FABP4	Fatty acid-binding protein, adipocyte	1	1	48	0.0351	2.4
COL3A1	collagen alpha-1(III) chain-like isoform 1	1	1	48	0.0492	1.7
AHNAK**	Neuroblast differentiation-associated protein AHNAK	1	1	48	0.0257	2.0
SF3B3	Splicing factor 3B subunit 3	1	1	48	0.0272	2.1
DPP3	Dipeptidyl peptidase 3	1	1	48	0.0041	1.9
PRKCSH	Glucosidase 2 subunit beta	1	1	48	0.0144	3.4
UFD1L	ubiquitin fusion degradation protein 1 homolog	1	1	47	0.0174	3.9
KIAA1967	protein KIAA1967 homolog	1	1	47	0.0390	6.4
RBM3	Putative RNA-binding protein 3	1	1	47	0.0030	2.7
ANXA1	Annexin A1	1	1	47	0.0063	1.6
DBI	Acyl-CoA-binding protein	1	1	46	0.0016	2.0
TPM4	Tropomyosin alpha-4 chain	1	1	46	0.0321	2.2
RPS26	40S ribosomal protein S26	1	1	46	0.0086	2.1
PFDN4	Prefoldin subunit 4	1	1	46	0.0305	1.8
GPX1	Glutathione peroxidase 1	1	1	45	0.0208	3.4
RBBP7	Histone-binding protein RBBP7	1	1	45	0.0016	2.3
WDR1	WD repeat-containing protein 1	1	1	45	0.0310	2.0
NEDD4	E3 ubiquitin-protein ligase NEDD4	1	1	44	0.0102	3.2
RAC1	Ras-related C3 botulinum toxin substrate 1	1	1	44	0.0417	3.2
PCNA	Proliferating cell nuclear antigen	1	1	44	0.0036	2.8
PGAM1	Phosphoglycerate mutase 1	1	1	43	0.0316	2.2
CD9	CD9 antigen	1	1	43	0.0331	2.7
N/A	Elongation factor 1-alpha 3	1	1	43	0.0422	5.6
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	1	1	43	0.0134	4.2
RARS	Arginyl-tRNA synthetase, cytoplasmic	1	1	43	0.0117	2.5

ANXA5	Annexin A5	1	1	43	0.0355	1.7
STMN1	Stathmin	1	1	43	0.0173	2.4
CFDP1	Craniofacial development protein 1	1	1	43	0.0156	2.0
ARSA	arylsulfatase A	1	1	42	0.0198	1.8
HNRNPH2	heterogeneous nuclear ribonucleoprotein H2	1	1	42	0.0472	2.1
PSPH	Phosphoserine phosphatase	1	1	42	0.0201	1.7
CAPZB	F-actin-capping protein subunit beta	1	1	41	0.0085	2.1
HPRT1	Hypoxanthine-guanine phosphoribosyltransferase	1	1	41	0.0412	2.2
LGALS1	Galectin-1	1	1	41	0.0186	2.4
RPL19	60S ribosomal protein L19	1	1	41	0.0091	4.1
TALDO1	transaldolase	1	1	41	0.0321	2.8
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	1	1	41	0.0203	3.0
SCP2	non-specific lipid-transfer protein	1	1	40	0.0376	2.7
PLEC	Plectin	1	1	40	0.0008	4.3
FAT1	Protocadherin Fat 1	1	1	40	0.0260	3.9
HEBP1	Heme-binding protein 1	1	1	40	0.0001	11.0

Table 3.2.11: Number of differentially expressed proteins between 31˚C and 37˚C at 120hrs post temperature shift in a CHO K1 non-producing cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	37˚C vs 31˚C 120hrs					
	Total		Up at 31˚C		Down at 31˚C	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	228	67	75	18	153	49
Apoptosis	6	2	2	0	4	2
	GNB2L1, APP, GAPDH, API5, DDX3X, Cycs	GNB2L1, APP	DDX3X, Cycs		GNB2L1, APP, GAPDH, API5	GNB2L1, APP
Protease	17	5	2	1	15	4
	ADAMTS7, MMP19, PRSS22, BMP1, DPP7, HTRA1, P15156, PLAT, ADAM19, MMP9, THOP1, CTSZ, ADAM10, C1ra, ADAM17, ADAM15, CTSD	ADAMTS7, MMP1,9 PRSS22, BMP1, DPP7	DPP7 CTSD	DPP7	ADAMTS7, MMP19, PRSS22, BMP1, HTRA1, P15156, PLAT, ADAM19, MMP9, THOP1, CTSZ, ADAM10, C1ra, ADAM17, ADAM15	ADAMTS7, MMP19, PRSS22, BMP1
Glycosidase	7	1	3	1	4	0
	MAN2B2, CTBS, NEU1, FUCA1, GBA, GANAB, NAGA	MAN2B2	MAN2B2, GANAB, NAGA	MAN2B2	CTBS, NEU1, FUCA1, GBA	

Table 3.2.12: List of host cell proteins, the expression of which decreased at 31˚C when compared to 37˚C, 120hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
SEMA3B	semaphorin-3B	8	8	492	0.0020	14.5
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	7	7	446	0.0048	4.4
GLG1	Golgi apparatus protein 1 precursor	6	6	407	0.0139	5.0
COL5A2	collagen alpha-2(V) chain	6	6	373	0.0094	2.3
SERPINF1	Pigment epithelium-derived factor	6	6	342	0.0013	9.5
NID1	Nidogen-1	5	5	283	0.0021	9.1
CLSTN1	Calsyntenin-1	5	4	281	0.0086	2.4
Psap	sulfated glycoprotein 1	5	5	269	0.0045	11.8
FN1	Fibronectin	5	5	268	0.0012	4.3
PXDN	peroxidasin homolog	3	3	232	0.0019	4.5
SEMA3E	semaphorin-3E	4	4	231	0.0012	3.0
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	3	3	231	0.0001	21.2
LTBP1	Latent-transforming growth factor beta-binding protein 1	3	2	216	0.0051	153.3
LTBP1	Latent-transforming growth factor beta-binding protein 1	3	2	212	0.0019	43.1
APLP2	Amyloid-like protein 2	3	3	209	0.0002	8.0
TPI1	Triosephosphate isomerase	2	2	198	0.0043	2.6
TGFB1	Transforming growth factor beta-1	3	3	192	0.0004	4.5
ADH5	Alcohol dehydrogenase class-3	2	2	189	0.0016	37.0
MMP19	matrix metalloproteinase-19	3	3	187	0.0044	4.0
ALCAM	CD166 antigen	3	3	184	0.0063	7.7
RPL30	60S ribosomal protein L30	3	3	182	0.0050	6.1
CYR61	Protein CYR61	3	3	178	0.0038	11.8
SEMA4B	semaphorin-4B	3	3	173	0.0078	3.8
EEF2	elongation factor 2	3	3	168	0.0078	13.6
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	3	3	165	0.0175	10.5
THBS1	thrombospondin-1	3	3	152	0.0012	9.4
PRSS22	brain-specific serine protease 4-like	3	3	150	0.0035	7.7
EFHD2	EF-hand domain-containing protein D2	2	2	149	0.0067	2.5
MIF	Macrophage migration inhibitory factor	2	2	146	0.0086	3.2
CLSTN1	Calsyntenin-1	2	1	142	0.0115	1.9
PKM	Pyruvate kinase isozymes M1/M2	2	2	142	0.0064	4.6
ECM1	Extracellular matrix protein 1	2	2	141	0.0022	2.1
RPS8	40S ribosomal protein S8	2	2	140	0.0069	1.9

PCOLCE2	Procollagen C-endopeptidase enhancer 2	2	2	136	0.0107	6.7
EMILIN1	EMILIN-1	2	2	124	0.0054	3.5
MDH1	Malate dehydrogenase, cytoplasmic	1	1	119	0.0084	24.5
VCP	Transitional endoplasmic reticulum ATPase	2	2	115	0.0270	3.0
LAMC1	laminin subunit gamma-1	2	2	115	0.0018	20.5
NCAM1	Neural cell adhesion molecule 1	2	2	115	0.0079	6.1
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide- alpha-2,3-sialyltransferase 1	2	2	110	0.0074	3.6
SERPINE1	Plasminogen activator inhibitor 1	2	2	110	0.0211	3.4
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2	2	109	0.0305	2.8
SIAE	sialate O-acetylesterase-like	2	2	109	0.0006	31.5
CSPG4	chondroitin sulfate proteoglycan 4	1	1	107	0.0232	2.6
APP	amyloid beta A4 protein	2	2	103	0.0225	45.5
BMP1	bone morphogenetic protein 1	2	2	103	0.0138	2.2
HTRA1	Serine protease HTRA1	1	1	102	0.0271	1.6
ATP6AP2	Renin receptor	2	2	102	0.0135	3.9
PRDX1	Peroxiredoxin-1	2	2	101	0.0179	5.1
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	1	1	100	0.0497	2.0
CACYBP	Calcyclin-binding protein	2	2	97	0.0038	3.0
RPLP0	60S acidic ribosomal protein P0	1	1	95	0.0425	9.6
CCT3	T-complex protein 1 subunit gamma	1	1	95	0.0192	24.9
P15156	Calcium-dependent serine proteinase	1	1	94	0.0114	11.4
FAM3C	Protein FAM3C	1	1	94	0.0015	8.2
NEO1	Neogenin	2	2	93	0.0098	2.1
IFI30	Gamma-interferon-inducible lysosomal thiol reductase	2	2	92	0.0260	4.4
RAN	GTP-binding nuclear protein Ran	1	1	92	0.0188	12.3
BLVRA	Biliverdin reductase A	1	1	91	0.0128	3.3
LGALS3BP	Galectin-3-binding protein	1	1	89	0.0294	21.8
RPS3	40S ribosomal protein S3	1	1	89	0.0365	11.7
PLAT	Tissue-type plasminogen activator	1	1	87	0.0132	6.3
CSF1	Macrophage colony-stimulating factor 1	1	1	84	0.0058	9.3
GPC1	Glypican-1	1	1	83	0.0212	6.6
RPSA	40S ribosomal protein SA	1	1	83	0.0389	4.5
RPL12	60S ribosomal protein L12	1	1	81	0.0270	17.0
PCBP1	Poly(rC)-binding protein 1	1	1	79	0.0347	8.7
GRN	granulins isoform 1	1	1	79	0.0055	2888.5
OLFML1	Olfactomedin-like protein 3	1	1	77	0.0209	17.1
NME1	Nucleoside diphosphate kinase A	1	1	77	0.0271	7.2

EFEMP1	EGF-containing fibulin-like extracellular matrix protein 1	1	1	76	0.0157	405.7
AGT	Angiotensinogen	1	1	76	0.0129	4.0
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	1	1	75	0.0497	66.6
RNASE4	Ribonuclease 4	1	1	73	0.0177	107.1
CTBS	Di-N-acetylchitobiase	1	1	73	0.0165	19.4
FSTL1	Follistatin-related protein 1	1	1	72	0.0006	83.9
LPL	Lipoprotein lipase	1	1	71	0.0200	8.8
LDHA	L-lactate dehydrogenase A chain	1	1	71	0.0278	10.0
NEU1	Sialidase-1	1	1	69	0.0001	12.9
TM6SF2	Transmembrane 6 superfamily member 2	1	1	68	0.0258	1.5
CFH	complement factor H-like, partial	1	1	68	0.0038	11.4
PTGR1	Prostaglandin reductase 1	1	1	68	0.0220	11.5
KIAA0319L	Dyslexia-associated protein KIAA0319-like protein	1	1	67	0.0006	3.0
YWHAQ	14-3-3 protein theta	1	1	67	0.0306	4.7
FUCA1	tissue alpha-L-fucosidase	1	1	67	0.0207	11.1
RPS11	40S ribosomal protein S11	1	1	66	0.0362	9.9
RPL14	60S ribosomal protein L14	1	1	66	0.0343	1.6
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	1	1	66	0.0073	60.4
EIF6	eukaryotic translation initiation factor 6	1	1	65	0.0015	192.3
ADAM19	Disintegrin and metalloproteinase domain-containing protein 19	1	1	65	0.0197	17.4
IGFBP4	insulin-like growth factor-binding protein 4-like	1	1	65	0.0293	60.1
MMP9	matrix metalloproteinase-9	1	1	64	0.0198	1520.5
PPA1	Inorganic pyrophosphatase	1	1	64	0.0390	14.4
PAPLN	papilin isoform 1	1	1	64	0.0050	4.4
GALNT7	N-acetylgalactosaminyltransferase 7	1	1	64	0.0001	5.7
RNH1	Ribonuclease inhibitor	1	1	64	0.0076	1439.9
IGSF8	Immunoglobulin superfamily member 8	1	1	64	0.0348	2.5
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	1	1	63	0.0030	3.4
GDI2	Rab GDP dissociation inhibitor beta	1	1	63	0.0008	105.4
OAF	out at first protein homolog	1	1	62	0.0039	2.5
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	1	1	61	0.0038	5.2
GBA	glucosylceramidase	1	1	61	0.0435	3.6
TCP1	T-complex protein 1 subunit alpha	1	1	59	0.0143	12.3
AARS	Alanyl-tRNA synthetase, cytoplasmic	1	1	59	0.0019	2.6
LMNA	Prelamin-A/C	1	1	59	0.0437	2.1
PSAT1	Phosphoserine aminotransferase	1	1	59	0.0012	12.0
LAMB1	laminin subunit beta-1	1	1	59	0.0386	9.1

RPS2	40S ribosomal protein S2	1	1	58	0.0282	6.3
ATOX1	Copper transport protein ATOX1	1	1	58	0.0010	8.5
SERPINI1	neuroserpin-like	1	1	58	0.0020	7.1
TINAGL1	Tubulointerstitial nephritis antigen-like	1	1	57	0.0326	3.3
TXNRD1	Thioredoxin reductase 1, cytoplasmic	1	1	57	0.0306	4.4
Akr1b1	Aldose reductase	1	1	57	0.0413	1.6
FST	Follistatin	1	1	57	0.0012	168.6
TNXB	Tenascin-X	1	1	55	0.0027	8.4
CDC42	Cell division control protein 42 homolog	1	1	55	0.0143	3.0
COL6A1	Collagen alpha-1(VI) chain	1	1	55	0.0327	6.5
THOP1	thimet oligopeptidase-like	1	1	55	0.0209	1.8
RPL5	60S ribosomal protein L5	1	1	54	0.0116	11.5
CTSZ	Cathepsin Z	1	1	54	0.0454	161.3
RPS12	40S ribosomal protein S12	1	1	54	0.0076	7.8
RPS6	40S ribosomal protein S6	1	1	54	0.0093	6.6
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	53	0.0133	28.6
CDNF	Cerebral dopamine neurotrophic factor	1	1	53	0.0001	9.6
API5	Apoptosis inhibitor 5	1	1	53	0.0385	1.6
TMEM132A	Transmembrane protein 132A	1	1	52	0.0047	4.5
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	1	1	52	0.0277	46.9
CCT7	T-complex protein 1 subunit eta	1	1	51	0.0041	13.1
RHOC	Rho-related GTP-binding protein RhoC	1	1	49	0.0434	11.5
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	1	1	49	0.0348	2.4
ANXA1	Annexin A1	1	1	49	0.0221	25.3
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	1	1	48	0.0364	2.1
TIMP1	Metalloproteinase inhibitor 1	1	1	48	0.0163	4.6
DKK3	Dickkopf-related protein 3	1	1	47	0.0019	15.0
CFL1	cofilin-1	1	1	47	0.0401	12.4
C1ra	Complement C1r-A subcomponent	1	1	47	0.0379	11.2
CORO1B	coronin-1B	1	1	47	0.0098	24.6
UGDH	UDP-glucose 6-dehydrogenase	1	1	46	0.0423	22.3
PLS3	Plastin-3	1	1	46	0.0003	Infinity
NHLRC3	NHL repeat-containing protein 3	1	1	45	0.0412	2.7
CRIP2	Cysteine-rich protein 2	1	1	45	0.0011	4.4
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	1	1	45	0.0034	67.6
MAMDC2	MAM domain-containing protein 2	1	1	44	0.0493	2.1
PLEKHG3	Pleckstrin homology domain-containing family G member 3	1	1	43	0.0123	1.9

LOXL3	Lysyl oxidase-like 3	1	1	43	0.0193	12.2
SRPX	Sushi repeat-containing protein SRPX	1	1	43	0.0101	7.3
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	42	0.0151	2.3
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	1	1	42	0.0072	2.7
GPR56	G-protein coupled receptor 56	1	1	42	0.0038	38.4
LGALS3	Galectin-3	1	1	41	0.0461	1.8
DDB1	DNA damage-binding protein 1	1	1	41	0.0334	3.4
HSP90AB1	heat shock protein HSP 90-beta-like	1	1	40	0.0385	1.8
CNTN1	Contactin-1	1	1	40	0.0151	4.2

Table 3.2.13: List of host cell proteins, the expression of which increased at 31˚C when compared to 37˚C, 120hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from a CHO K1 non-producing cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
AHNAK	Neuroblast differentiation-associated protein AHNAK	4	4	249	0.0074	3.0
MFGE8	Lactadherin	4	4	230	0.0031	4.4
GSTM2	glutathione S-transferase Mu 2	3	2	214	0.0006	6.3
GSTM5	Glutathione S-transferase Mu 5	3	2	192	0.0014	12.3
HSP90B1	endoplasmin	3	3	188	0.0157	2.1
HSPA5	78 kDa glucose-regulated protein	3	3	185	0.0191	2.9
PDIA3	Protein disulfide-isomerase A3	2	2	171	0.0103	3.0
Gstm7	Glutathione S-transferase Mu 7	3	2	168	0.0108	2.3
DPP7	Dipeptidyl peptidase 2	2	2	139	0.0260	2.7
EZR	Ezrin	2	2	136	0.0108	3.1
COL3A1	collagen alpha-1(III) chain-like isoform 1	2	2	133	0.0168	5.5
SPARC	SPARC	2	2	132	0.0038	11.8
CCDC8	coiled-coil domain-containing protein 80-like	2	2	132	0.0261	2.1
EIF4A1	Eukaryotic initiation factor 4A-I	2	2	112	0.0210	2.7
HIST1H2AG	Histone H2A type 1	2	2	109	0.0119	3.8
MAN2B2	Epididymis-specific alpha-mannosidase	2	2	108	0.0130	3.6
PROS1	vitamin K-dependent protein S	2	2	104	0.0150	2.5
SPTBN1	Spectrin beta chain, brain 1	1	1	97	0.0097	2.1
YWHAE	14-3-3 protein epsilon	1	1	95	0.0401	1.9
GOT1	aspartate aminotransferase, cytoplasmic	1	1	88	0.0263	17.7
ACTG1	Actin, cytoplasmic 2	1	1	86	0.0254	2.5
CAST	Calpastatin	1	1	86	0.0441	2.5
MSN	moesin	1	1	84	0.0228	3.3
SPTAN1	Spectrin alpha chain, brain	2	2	84	0.0287	2.6
EPDR1	Mammalian ependymin-related protein 1	1	1	79	0.0075	3.0

PCYOX1	prenylcysteine oxidase	1	1	77	0.0085	15.6
PLA2G7	Platelet-activating factor acetylhydrolase	1	1	77	0.0065	2.9
MCM7	DNA replication licensing factor MCM7	1	1	76	0.0224	2.5
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0013	4.5
CSRP1	Cysteine and glycine-rich protein 1	1	1	75	0.0037	1.8
GANAB	Neutral alpha-glucosidase AB	1	1	75	0.0374	4.9
ERP29	Endoplasmic reticulum resident protein 29	1	1	73	0.0233	2.5
NONO	Non-POU domain-containing octamer-binding protein	1	1	73	0.0062	2.2
ELAVL1	ELAV-like protein 1	1	1	72	0.0302	2.5
ATXN10	Ataxin-10	1	1	72	0.0026	14.8
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	1	1	71	0.0148	2.4
VCL	Vinculin	1	1	70	0.0238	2.3
SH3BGRL2	SH3 domain-binding glutamic acid-rich-like protein	1	1	69	0.0175	2.1
BLVRB	Flavin reductase	1	1	68	0.0129	4.1
NAGA	Alpha-N-acetylgalactosaminidase	1	1	68	0.0116	2.8
DDX3X	ATP-dependent RNA helicase DDX3X	1	1	68	0.0041	17.1
ANXA8	Annexin A8	1	1	67	0.0017	16.5
GSTA3	Glutathione S-transferase alpha-3	1	1	67	0.0097	2.3
PPP1R7	Protein phosphatase 1 regulatory subunit 7	1	1	65	0.0030	3.0
VIM	vimentin	1	1	64	0.0053	11.9
CBR1	Carbonyl reductase [NADPH] 1	1	1	63	0.0017	2.8
P4hb	Protein disulfide-isomerase	1	1	62	0.0407	1.9
NCL	nucleolin	1	1	60	0.0500	1.5
EWSR1	RNA-binding protein EWS	1	1	60	0.0066	5.3
LOXL4	Lysyl oxidase-like 4	1	1	60	0.0462	1.7
CD81	CD81 antigen	1	1	59	0.0196	3.6
RPS19	40S ribosomal protein S19	1	1	58	0.0032	3.6
UBA1	Ubiquitin-like modifier-activating enzyme 1	1	1	57	0.0326	2.1
CES1	liver carboxylesterase-like isoform 1	1	1	56	0.0005	118.1
NUCB2	Nucleobindin-2	1	1	55	0.0050	Infinity

PRDX6	Peroxiredoxin-6	1	1	53	0.0240	11.0
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	1	1	53	0.0005	2.3
CALR	Calreticulin	1	1	53	0.0104	3.0
TSTA3	GDP-L-fucose synthase	1	1	51	0.0134	4.8
PSME2	proteasome activator complex subunit 2-like isoform 1	1	1	50	0.0463	1.7
DDX39B	Spliceosome RNA helicase BAT1	1	1	50	0.0402	9.3
CMPK1	UMP-CMP kinase	1	1	49	0.0470	2.8
D17Wsu104e	UPF0556 protein C19orf10 homolog	1	1	49	0.0122	2.7
GNS	N-acetylglucosamine-6-sulfatase	1	1	49	0.0117	3.2
RBM3	Putative RNA-binding protein 3	1	1	47	0.0001	51.7
DBI	Acyl-CoA-binding protein	1	1	46	0.0426	1.8
FTH1	Ferritin heavy chain	1	1	46	0.0435	2.0
PFDN4	Prefoldin subunit 4	1	1	46	0.0487	1.5
GPX1	Glutathione peroxidase 1	1	1	45	0.0163	4.8
NEDD4	E3 ubiquitin-protein ligase NEDD4	1	1	44	0.0248	4.2
RAB7A	ras-related protein Rab-7a-like	1	1	44	0.0452	1.7
CTSD	cathepsin D	1	1	43	0.0296	3.1
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	41	0.0263	59.5
Cycs	Cytochrome c, somatic	1	1	40	0.0073	11.2
FAT1	Protocadherin Fat 1	1	1	40	0.0064	4.6

Table 3.2.14: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 37˚C culture. The list below displays those proteins that were found to correlate negatively (decrease in expression) with time in a CHO K1 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptides	Quantitative Peptides	Score	Anova (p)	Fold
SEMA3C	Semaphorin-3C	-0.994	0.0061	1	1	55	0.0263	2.1
CTGF	Connective tissue growth factor	-0.986	0.0139	1	1	53	0.0035	13.0
COL6A1	Collagen alpha-1(VI) chain	-0.978	0.0220	1	1	42	0.0294	4.7
PROS1	vitamin K-dependent protein S	-0.963	0.0372	4	4	214	0.0019	2.4
PLA2G7	platelet-activating factor acetylhydrolase-like	-0.960	0.0401	1	1	77	0.0007	6.0

Table 3.2.15: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 37˚C culture. The list below displays those proteins that were found to correlate positively (increase in expression) with time in a CHO K1 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
PPA1	inorganic pyrophosphatase-like	0.998	0.0023	1	1	64	0.0117	17.3
GLG1	Golgi apparatus protein 1 precursor	0.997	0.0029	2	2	143	0.0211	12.3
PCBP3	poly(rC)-binding protein 3	0.997	0.0033	3	3	159	0.0008	7.5
MYL6	Myosin light polypeptide 6	0.997	0.0034	1	1	65	0.0181	14.1
APP	amyloid beta A4 protein	0.995	0.0047	1	1	42	0.0271	10.7
SEMA3B	semaphorin-3B	0.995	0.0048	4	4	275	0.0114	8.9
Akr1b1	aldose reductase-like	0.994	0.0057	3	3	162	0.0015	4.8
ARF1	ADP-ribosylation factor 1-like, partial	0.993	0.0071	1	1	93	0.0444	13.0
PHGDH	d-3-phosphoglycerate dehydrogenase-like	0.992	0.0076	4	4	297	0.0001	5.4
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	0.992	0.0079	1	1	57	0.0270	7.2
RPS8	40S ribosomal protein S8	0.992	0.0080	1	1	91	0.0071	3.0
GSS	glutathione synthetase-like	0.991	0.0092	1	1	59	0.0485	4.2
PLTP	phospholipid transfer protein	0.989	0.0107	3	3	185	0.0026	5.5
SERPINI1	neuroserpin-like	0.989	0.0113	1	1	58	0.0402	6.4
RPL12	60S ribosomal protein L12-like	0.988	0.0119	1	1	81	0.0219	25.7
RPS2	40S ribosomal protein S2	0.987	0.0126	1	1	58	0.0142	9.3
Gstm7	glutathione S-transferase Mu 7-like	0.986	0.0145	2	1	108	0.0034	4.5
RPSA	40S ribosomal protein SA	0.985	0.0150	1	1	83	0.0422	7.6
PRDX1	Peroxiredoxin-1	0.984	0.0156	2	2	91	0.0244	3.9
TAGLN2	transgelin-2-like	0.983	0.0168	3	3	211	0.0005	5.4
ENO1	alpha-enolase	0.982	0.0175	2	2	96	0.0071	5.5
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	0.982	0.0177	1	1	68	0.0400	2.7
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	0.982	0.0182	1	1	49	0.0191	3.6
SERPINF1	Pigment epithelium-derived factor	0.981	0.0189	8	7	422	0.0009	6.8
N/A	putative allantoicase	0.980	0.0202	1	1	47	0.0218	3.9
EIF2S1	eukaryotic translation initiation factor 2 subunit 1-like	0.979	0.0209	2	2	127	0.0120	4.7
TPI1	Triosephosphate isomerase	0.979	0.0211	3	3	283	0.0019	3.8
SFPQ	splicing factor, proline- and glutamine-rich	0.979	0.0212	1	1	75	0.0452	3.2

YWHAB	14-3-3 protein beta/alpha isoform 2	0.978	0.0224	1	1	62	0.0125	6.5
MOB3A	mps one binder kinase activator-like 3-like	0.977	0.0226	1	1	53	0.0027	2.4
GRN	granulins isoform 1	0.975	0.0251	1	1	79	0.0455	11.9
SBSN	Suprabasin	0.974	0.0256	3	3	243	0.0017	6.0
ST13	hsc70-interacting protein-like, partial	0.974	0.0263	1	1	45	0.0256	3.3
RPLP0	60S acidic ribosomal protein P0-like isoform 1	0.974	0.0264	1	1	53	0.0030	21.3
NME1	nucleoside diphosphate kinase A-like isoform 1	0.973	0.0266	1	1	77	0.0233	8.5
NHP2L1	NHP2-like protein 1-like	0.973	0.0266	1	1	67	0.0003	6.4
GSTP1	Glutathione S-transferase P	0.973	0.0268	1	1	61	0.0300	7.4
RPS21	40S ribosomal protein S21-like	0.973	0.0270	1	1	55	0.0281	5.8
PKM	Pyruvate kinase isozymes M1/M2	0.972	0.0281	3	3	214	0.0115	5.8
NUCB1	Nucleobindin-1	0.970	0.0296	1	1	55	0.0248	3.1
RNASET2	ribonuclease T2-like	0.970	0.0297	1	1	72	0.0460	5.6
S100A6	protein S100-A6	0.970	0.0304	1	1	67	0.0224	3.5
PCNA	Proliferating cell nuclear antigen	0.970	0.0304	1	1	89	0.0003	4.4
NUMA1	Nuclear mitotic apparatus protein 1	0.969	0.0313	1	1	73	0.0095	7.1
CRIP2	cysteine-rich protein 2-like	0.967	0.0325	1	1	45	0.0012	14.9
RAB1A	ras-related protein Rab-1A isoform 1	0.967	0.0331	2	2	125	0.0011	6.7
TALDO1	transaldolase	0.967	0.0333	4	4	203	0.0049	6.6
PAPLN	papilin isoform 1	0.967	0.0335	2	2	119	0.0008	3.0
NASP	nuclear autoantigenic sperm protein-like	0.966	0.0335	1	1	71	0.0001	4.1
RPS27	40S ribosomal protein S27	0.966	0.0337	1	1	67	0.0013	3.4
NCL	nucleolin	0.966	0.0337	1	1	41	0.0141	2.8
EWSR1	RNA-binding protein EWS	0.966	0.0340	1	1	60	0.0360	3.9
UGDH	UDP-glucose 6-dehydrogenase	0.965	0.0348	2	2	182	0.0161	2.7
RPS17	40S ribosomal protein S17	0.965	0.0349	1	1	42	0.0386	2.9
VIM	vimentin	0.965	0.0350	4	4	215	0.0010	4.0
ACTB	actin, cytoplasmic 1	0.964	0.0361	3	3	187	0.0038	3.1
HSP90AB1	heat shock protein HSP 90-beta-like	0.963	0.0370	3	3	169	0.0018	3.1
KPNB1	Importin subunit beta-1	0.963	0.0371	2	2	105	0.0193	4.0
UBE2K	Ubiquitin-conjugating enzyme E2 K	0.963	0.0374	1	1	51	0.0263	3.5
ECT2L	Epithelial cell transforming sequence 2 oncogene-like	0.962	0.0375	1	1	61	0.0067	4.4
RPIA	Ribose-5-phosphate isomerase	0.962	0.0378	1	1	44	0.0155	3.5
YWHAQ	14-3-3 protein theta-like	0.962	0.0379	2	2	163	0.0052	3.5

DBN1	Drebrin	0.961	0.0387	1	1	85	0.0002	5.4
PTBP2	Polypyrimidine tract-binding protein 2	0.961	0.0390	1	1	61	0.0053	2.8
RPL15	60S ribosomal protein L15-like, partial	0.960	0.0397	1	1	62	0.0305	3.0
ILF3	Interleukin enhancer-binding factor 3	0.960	0.0401	1	1	83	0.0027	4.0
CLIC1	chloride intracellular channel protein 1-like	0.959	0.0414	1	1	74	0.0498	3.0
GLO1	lactoylglutathione lyase-like	0.958	0.0420	1	1	54	0.0362	4.0
EFEMP1	EGF-containing fibulin-like extracellular matrix protein 1	0.957	0.0427	1	1	50	0.0033	70.5
KIF27	Kinesin-like protein KIF27	0.955	0.0446	1	1	52	0.0458	8.1
ENDOD1	nuclease domain-containing protein 1	0.955	0.0446	1	1	46	0.0477	3.0
RPS11	40S ribosomal protein S11-like	0.955	0.0450	1	1	66	0.0385	9.2
RBM39	RNA-binding protein 39 isoform a	0.955	0.0452	1	1	64	0.0194	3.6
TCP1	T-complex protein 1 subunit alpha	0.954	0.0461	3	3	150	0.0078	6.6
VCP	Transitional endoplasmic reticulum ATPase	0.954	0.0463	2	2	119	0.0038	1.9
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	0.953	0.0471	7	7	441	0.0000	5.3
CBR1	Carbonyl reductase	0.953	0.0471	2	2	122	0.0208	2.7
IDUA	alpha-L-iduronidase	0.952	0.0482	1	1	44	0.0180	3.0
PGK1	phosphoglycerate kinase 1	0.952	0.0485	2	2	154	0.0073	8.2

Table 3.2.16: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 31˚C culture. The list below displays those proteins that were found to correlate positively (increase expression) with time in a CHO K1 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptides	Quantitative Peptides	Score	Anova p-value	Fold
AHNAK	Neuroblast differentiation-associated protein	0.999	0.0005	2	2	131	0.0005	6.9
MFGE8	Lactadherin	0.997	0.0026	2	2	95	0.0024	2.8
RASGRF1	Ras-specific guanine nucleotide-releasing factor 1	0.992	0.0079	1	1	47	0.0459	1.5
RPS20	40S ribosomal protein S20	0.988	0.0118	1	1	51	0.0316	2.3
S100A13	Protein S100-A13	0.984	0.0157	1	1	52	0.0443	4.5
CIRBP	Cold-inducible RNA-binding protein	0.983	0.0173	1	1	60	0.0029	3.1
MYL6	Myosin light polypeptide 6	0.982	0.0181	1	1	44	0.0360	3.4
Gsta6	Glutathione S-transferase A6	0.979	0.0212	1	1	66	0.0039	2.6
COL3A1	collagen alpha-1(III) chain-like isoform 1	0.978	0.0223	2	2	112	0.0053	3.1
VCL	Vinculin	0.978	0.0224	4	4	251	0.0002	2.1
LGALS3	Galectin-3	0.977	0.0231	1	1	43	0.0027	4.5
APRT	adenine phosphoribosyltransferase-like	0.976	0.0241	2	2	99	0.0017	3.5
RAB7A	ras-related protein Rab-7a-like	0.974	0.0263	2	2	90	3.23E-06	4.2
VIM	vimentin	0.973	0.0265	2	2	94	0.0189	6.0
GSTM5	glutathione S-transferase Mu 5-like	0.973	0.0274	2	2	149	0.0001	5.4
RPS27A	ubiquitin-40S ribosomal protein S27a-like	0.972	0.0282	1	1	49	0.0127	2.1
Otub1	Ubiquitin thioesterase OTUB1	0.971	0.029	1	1	74	0.0202	2.3
MDH1	malate dehydrogenase, cytoplasmic-like	0.966	0.0343	1	1	61	0.0107	2.6
ANXA8	annexin A8-like	0.964	0.0357	1	1	68	3.69E-05	10.5
NAGLU	alpha-N-acetylglucosaminidase-like	0.963	0.0368	2	2	116	0.0007	4.6
RPL9	60S ribosomal protein L9	0.963	0.0371	1	1	51	0.0047	2.2
EWSR1	RNA-binding protein EWS	0.956	0.0441	1	1	61	0.0003	6.7
PKM	Pyruvate kinase isozymes M1/M2	0.956	0.0441	2	1	125	0.0427	2.3
AHNAK	Neuroblast differentiation-associated protein AHNAK	0.956	0.0442	9	9	486	0.0002	3.8
ECT2L	Epithelial cell transforming sequence 2 oncogene-like	0.953	0.0474	1	1	62	0.0093	2.4
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	0.951	0.0485	1	1	71	0.0187	2.6
NME1	nucleoside diphosphate kinase A-like isoform 1	0.951	0.0492	1	1	44	0.0160	2.9
MYL9	myosin regulatory light polypeptide 9-like	0.95	0.0499	1	1	69	0.0093	2.0

Table 3.2.17: Table of proteins common to 24hrs vs 120hrs 37˚C and 24hrs vs 120hrs 31˚C differentially expressed protein lists from non-producing CHO K1 cell line. This table also includes information from 37˚C vs 31˚C at 120hrs so as to provide an indication of which culture condition the relative abundance of the given HCP is greatest.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Up at	Comparison	Function
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	6	6	367	0.0337	1.6	120hrs	24hrs vs 120hrs 37C	Miscellaneous
		2	2	164	0.0070	4.0	120hrs	24hrs vs 120hrs 31C	
		7	7	446	0.0048	4.4	37C	37C vs 31C 120hrs	
C1ra	Complement C1r-A subcomponent	3	3	179	0.0044	6.9	24hrs	24hrs vs 120hrs 37C	Protease
		3	3	179	0.0025	4.2	24hrs	24hrs vs 120hrs 31C	
		1	1	47	0.0379	11.2	37C	37C vs 31C 120hrs	
HSP90B1	Endoplasmin	2	2	104	0.0008	2.4	120hrs	24hrs vs 120hrs 37C	Anti-apoptotic
		2	2	131	0.0190	1.8	24hrs	24hrs vs 120hrs 31C	
		3	3	188	0.0157	2.1	31C	37C vs 31C 120hrs	
HSP90AB1	Heat shock protein HSP 90-beta-like	3	3	169	0.0010	2.6	120hrs	24hrs vs 120hrs 37C	Cell stress
		3	2	180	0.0008	2.3	24hrs	24hrs vs 120hrs 31C	
		1	1	40	0.0385	1.8	37C	37C vs 31C 120hrs	
MSN	Moesin	2	2	118	0.0283	2.4	120hrs	24hrs vs 120hrs 37C	Structural
		2	1	169	0.0265	2.2	120hrs	24hrs vs 120hrs 31C	
		1	1	84	0.0228	3.3	31C	37C vs 31C 120hrs	
AHNAK	Neuroblast differentiation-associated protein AHNAK	3	3	167	0.0052	4.4	120hrs	24hrs vs 120hrs 37C	Miscellaneous
		8	8	474	0.0057	4.2	120hrs	24hrs vs 120hrs 31C	
		4	4	249	0.0074	3.0	31C	37C vs 31C 120hrs	
PKM	Pyruvate kinase isozymes M1/M2	5	5	345	0.0193	2.7	120hrs	24hrs vs 120hrs 37C	Glycolysis
		3	3	187	0.0034	4.8	24hrs	24hrs vs 120hrs 31C	
		2	2	142	0.0064	4.6	37C	37C vs 31C 120hrs	

RAB7A	Ras-related protein Rab-7a-like	2	2	93	0.0002	8.3	120hrs	24hrs vs 120hrs 37C	Protein Transport
		2	2	93	0.0031	4.5	120hrs	24hrs vs 120hrs 31C	
		1	1	44	0.0452	1.7	31C	37C vs 31C 120hrs	
SEMA3B	Semaphorin-3B	5	5	323	0.0140	8.4	120hrs	24hrs vs 120hrs 37C	Cell cell signaling
		2	2	99	0.0064	2.4	24hrs	24hrs vs 120hrs 31C	
		8	8	492	0.0020	14.5	37C	37C vs 31C 120hrs	
VCP	Transitional endoplasmic reticulum ATPase	2	2	103	0.0335	1.7	120hrs	24hrs vs 120hrs 37C	Miscellaneous
		2	2	100	0.0268	1.9	120hrs	24hrs vs 120hrs 31C	
		2	2	115	0.0270	3.0	37C	37C vs 31C 120hrs	
VIM	Vimentin	4	4	215	0.0022	3.4	120hrs	24hrs vs 120hrs 37C	Cell signaling
		4	4	224	0.0146	2.4	120hrs	24hrs vs 120hrs 31C	
		1	1	64	0.0053	11.9	31C	37C vs 31C 120hrs	
VCL	Vinculin	5	5	358	0.0010	2.3	120hrs	24hrs vs 120hrs 37C	Cell adhesion
		5	5	366	0.0022	2.2	120hrs	24hrs vs 120hrs 31C	
		1	1	70	0.0238	2.3	31C	37C vs 31C 120hrs	

Table 3.2.18: Table of proteins common to Pearson correlation analysis of protein expression over time at 24, 72, 96 and 120 hours at 37˚C and 24, 72, 96 and 120 hours at 31˚C in a non-producing CHO K1 cell line.

Gene Symbol	Description	corr	p-values	Total Peptides	Quantitative Peptides	Score	Anova (p)	Fold	Up at	Comparison
ECT2	Epithelial cell transforming sequence 2 oncogene-like	0.9625	0.0375	1	1	61	0.0067	4.4	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9526	0.0474	1	1	62	0.0093	2.4	120hrs	24, 72, 96 and 120 hours at 31˚C
MYL6	Myosin light polypeptide 6	0.9966	0.0034	1	1	65	0.0181	14.1	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9819	0.0181	1	1	44	0.0360	3.4	120hrs	24, 72, 96 and 120 hours at 31˚C
NME1	Nucleoside diphosphate kinase A-like isoform 1	0.9734	0.0266	1	1	77	0.0233	8.5	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9508	0.0492	1	1	44	0.0160	2.9	120hrs	24, 72, 96 and 120 hours at 31˚C
VIM	Vimentin	0.965	0.035	4	4	215	0.0010	4.0	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9735	0.0265	2	2	94	0.0189	6.0	120hrs	24, 72, 96 and 120 hours at 31˚C
EWSR1	RNA-binding protein EWS	0.966	0.034	1	1	60	0.0360	3.9	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9559	0.0441	1	1	61	0.0003	6.7	120hrs	24, 72, 96 and 120 hours at 31˚C
PKM	Pyruvate kinase isozymes M1/M2	0.9719	0.0281	3	3	214	0.0115	5.8	120hrs	24, 72, 96 and 120 hours at 37˚C
		0.9559	0.0441	2	1	125	0.0427	2.3	120hrs	24, 72, 96 and 120 hours at 31˚C
		N/A	N/A	2	2	142	0.0064	4.6	37˚C	37˚C vs 31˚C at 120hrs

Table 3.2.19: List of tables containing quantitative information on proteins classified as secreted by the Uniprot protein database.

Condition	Appendix Table
Up at 120hrs when compared to 24hrs at 37˚C	Table 3.2.22
Down at 120hrs when compared to 24hrs at 37˚C	Table 3.2.23
Up at 120hrs when compared to 24hrs at 31˚C	Table 3.2.24
Down at 120hrs when compared to 24hrs at 31˚C	Table 3.2.25

Table 3.2.20: GO cellular component enrichment for differentially expressed host cell proteins identified in the conditioned media of a CHO K1 non-producing cell line at 37˚C when 24hrs was compared to 120hrs (post temperature shift for a culture grown in parallel) analysed using quantitative label free LC/MS. An adjusted p-value of ≤0.05 (Benjamini) was used as a statistical cut off to generate the list of enriched cellular components.

Cellular Component	Count	P-Value	Benjamini
cytosol	99	3.60E-29	1.20E-26
cytosolic part	29	2.10E-18	3.40E-16
ribonucleoprotein complex	48	3.50E-17	3.80E-15
cytosolic ribosome	21	4.40E-16	3.60E-14
cytosolic small ribosomal subunit	14	1.40E-12	9.40E-11
ribosomal subunit	21	4.70E-12	2.60E-10
melanosome	18	7.00E-12	3.30E-10
pigment granule	18	7.00E-12	3.30E-10
ribosome	26	8.40E-12	3.50E-10
small ribosomal subunit	14	8.00E-10	2.90E-08
membrane-bounded vesicle	37	8.70E-09	2.80E-07
cytoplasmic membrane-bounded vesicle	36	1.30E-08	3.90E-07
proteinaceous extracellular matrix	26	3.70E-08	1.00E-06
extracellular matrix	27	4.00E-08	1.00E-06
vesicle	39	6.40E-08	1.50E-06
lysosome	20	1.90E-07	4.20E-06
lytic vacuole	20	1.90E-07	4.20E-06
cytoplasmic vesicle	37	1.90E-07	4.00E-06
extracellular region part	47	3.50E-07	6.60E-06
extracellular matrix part	14	1.60E-06	3.00E-05
vacuole	20	2.90E-06	4.90E-05
chaperonin-containing T-complex	5	7.50E-06	1.20E-04
platelet alpha granule lumen	8	2.70E-05	4.20E-04
platelet alpha granule	9	2.70E-05	4.10E-04
spliceosome	13	3.30E-05	4.60E-04
non-membrane-bounded organelle	86	3.70E-05	5.00E-04
intracellular non-membrane-bounded organelle	86	3.70E-05	5.00E-04
cytoplasmic membrane-bounded vesicle lumen	8	4.30E-05	5.60E-04
basement membrane	10	5.00E-05	6.20E-04
vesicle lumen	8	5.80E-05	7.00E-04
cytosolic large ribosomal subunit	7	1.60E-04	1.90E-03
extracellular region	68	2.00E-04	2.30E-03
actin cytoskeleton	17	2.90E-04	3.20E-03
heterogeneous nuclear ribonucleoprotein complex	5	4.30E-04	4.50E-03
soluble fraction	18	5.40E-04	5.50E-03
proteasome core complex	5	8.30E-04	8.20E-03
membrane-enclosed lumen	60	1.70E-03	1.60E-02
proteasome complex	7	2.10E-03	2.00E-02
large ribosomal subunit	7	3.40E-03	3.10E-02
cortical cytoskeleton	6	4.20E-03	3.70E-02
extracellular space	27	4.50E-03	3.80E-02
lysosomal lumen	3	4.60E-03	3.80E-02
eukaryotic translation elongation factor 1 complex	3	4.60E-03	3.80E-02
basal lamina	4	5.60E-03	4.50E-02
secretory granule	11	6.30E-03	4.90E-02

Table 3.2.21: GO cellular component enrichment for differentially expressed host cell proteins identified in the conditioned media of a CHO K1 non-producing cell line at 31˚C when 24hrs was compared to 120hrs (post temperature shift) analysed using quantitative label free LC/MS. An adjusted p-value of ≤0.05 (Benjamini) was used as a statistical cut off to generate the list of enriched cellular components.

Cellular Component	Gene Count	P-Value	Benjamini
melanosome	11	9.90E-09	2.20E-06
pigment granule	11	9.90E-09	2.20E-06
extracellular region	44	5.10E-08	5.60E-06
cytosol	31	3.70E-06	2.70E-04
endoplasmic reticulum lumen	8	9.70E-06	5.30E-04
extracellular region part	24	2.50E-05	1.10E-03
proteinaceous extracellular matrix	13	4.60E-05	1.70E-03
extracellular matrix	13	9.50E-05	3.00E-03
lysosome	10	1.60E-04	4.50E-03
lytic vacuole	10	1.60E-04	4.50E-03
cytoplasmic membrane-bounded vesicle	16	1.90E-04	4.70E-03
membrane-bounded vesicle	16	2.70E-04	6.00E-03
vesicle	17	5.20E-04	1.00E-02
vacuole	10	6.10E-04	1.10E-02
cytoplasmic vesicle	16	9.80E-04	1.60E-02
membrane-enclosed lumen	31	1.60E-03	2.60E-02
extracellular space	16	1.90E-03	2.70E-02
organelle lumen	30	2.50E-03	3.40E-02

Table 3.2.22: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which increased at 120hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of conditioned media from a CHO K1 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
SERPINF1	Pigment epithelium-derived factor	8	8	424	0.0028	6.6	Cell proliferation
HSPG2	Basement membrane-specific heparan sulfate proteoglycan core protein	6	6	367	0.0337	1.6	Miscellaneous
SEMA3B	Semaphorin-3B	5	5	323	0.0140	8.4	Cell-cell signalling
Psap	Sulfated glycoprotein 1	5	5	289	0.0126	7.7	Miscellaneous
SBSN	Suprabasin	3	2	243	0.0078	6.0	Miscellaneous
CLU	Clusterin	3	3	212	0.0087	3.3	Apoptosis
NCAM1	Neural cell adhesion molecule 1	3	3	191	0.0147	3.5	Axon guidance
PLTP	phospholipid transfer protein	3	3	185	0.0053	4.8	Lipid transport
NID1	Nidogen-1	3	3	181	0.0046	150.4	Cell adhesion
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	3	3	150	0.0037	35.8	Extracellular matrix organization
PAPLN	Papilin isoform 1	2	2	123	0.0063	2.7	Metalloendopeptidase activity
COL5A2	Collagen alpha-2(V) chain	2	2	121	0.0028	2.4	Miscellaneous
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	2	2	119	0.0081	2.9	Serine-type endopeptidase inhibitor activity
ECM1	Extracellular matrix protein 1	2	2	103	0.0040	3.4	Inhibitor of MMP9
LGALS3	Galectin-3	2	2	103	0.0094	12.1	Stress
MIF	Macrophage migration inhibitory factor	1	1	76	0.0061	2.9	Cell proliferation
FSTL1	Follistatin-related protein 1	1	1	72	0.0272	16.9	Modulates growth factor action
QSOX1	Sulfhydryl oxidase 1	1	1	64	0.0491	1.9	Oxidoreductase
TGFB1	Transforming growth factor beta-1	1	1	63	0.0173	16.5	Growth factor
LTBP1	Latent-transforming growth factor beta-binding protein 1	1	1	62	0.0121	32.4	Cell proliferation
LGALS1	Galectin-1	1	1	59	0.0397	2.3	Apoptosis
SERPINI1	Neuroserpin-like	1	1	58	0.0041	6.7	Protease inhibitor
SIAE	Sialate O-acetylesterase-like	1	1	57	0.0461	5.9	Hydrolase

TINAGL1	Tubulointerstitial nephritis antigen-like	1	1	57	0.0008	6.2	Endosomal transport
TNXB	Tenascin-X	1	1	55	0.0030	3.7	Cell adhesion
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide- alpha-2,3-sialyltransferase 1	1	1	52	0.0089	2.8	O-glycan processing
HAPLN1	hyaluronan and proteoglycan link protein 1-like	1	1	48	0.0011	2.3	Miscellaneous
DKK3	Dickkopf-related protein 3	1	1	47	0.0487	8.5	Wnt signaling pathway
KARS	Lysyl-tRNA synthetase	1	1	46	0.0369	2.4	Protein biosynthesis
LOXL3	Lysyl oxidase-like 3	1	1	43	0.0381	6.4	Transcription
DCN	Decorin	1	1	42	0.0437	20.2	Extracellular matrix organization
BMP1	Bone morphogenetic protein 1	1	1	41	0.0312	12.5	Protease

Table 3.2.23: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which decreased at 120hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of conditioned media from a CHO K1 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
DPP7	Dipeptidyl peptidase 2	5	5	324	0.0034	3.3	Protease
PROS1	Vitamin K-dependent protein S	5	5	266	0.0048	2.9	Endopeptidase inhibitor activity
FN1	Fibronectin	3	3	255	0.0423	1.9	Cell adhesion
LAMB1	Laminin subunit beta-1	3	3	223	0.0142	2.3	Cell proliferation
CCDC8	Coiled-coil domain-containing protein 80-like	3	3	155	0.0169	2.3	Cell adhesion
EPDR1	Mammalian ependymin-related protein 1	2	2	148	0.0001	7.1	Cell-cell adhesion
LAMC1	Laminin subunit gamma-1	2	2	137	0.0427	1.7	Cell proliferation
PTX3	pentraxin-related protein PTX3	2	2	127	0.0006	5.0	Miscellaneous
MAN2B2	Epididymis-specific alpha-mannosidase	2	2	125	0.0023	5.8	Glycosidase
MMP9	matrix metalloproteinase-9	1	1	90	0.0168	3.3	Protease
COL3A1	Collagen alpha-1(III) chain-like isoform 1	1	1	85	0.0412	2.1	Miscellaneous
SDC4	Syndecan-4	1	1	84	0.0443	8.5	Signal transduction
LGALS3BP	Galectin-3-binding protein	1	1	83	0.0279	3.4	Cell adhesion
PLA2G7	Platelet-activating factor acetylhydrolase	1	1	77	0.0006	7.1	Lipid metabolism
PRSS35	Inactive serine protease 35	1	1	73	0.0153	3.5	Metabolic process
CYR61	Protein CYR61	1	1	61	0.0164	2.5	Cell proliferation
CXCL3	C-X-C motif chemokine 3	1	1	60	0.0341	3.1	Inflammatory response
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	58	0.0434	2.2	Protease
SEMA3C	Semaphorin-3C	1	1	57	0.0013	2.4	Miscellaneous
EMILIN1	EMILIN-1	1	1	56	0.0105	1.9	Cell adhesion
AGRNL	Agrin-like isoform 1	1	1	55	0.0137	2.8	Glycosaminoglycan binding
CTGF	Connective tissue growth factor	1	1	53	0.0051	14.9	Cell proliferation
SPARC	SPARC	1	1	47	0.0171	18.3	Miscellaneous
SRPX2	Sushi repeat-containing protein SRPX2	1	1	44	0.0275	1.9	Cell proliferation
COL6A1	Collagen alpha-1(VI) chain	1	1	42	0.0028	5.1	Miscellaneous

Table 3.2.24: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which increased at 120hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of conditioned media from a CHO K1 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
CTSD	Cathepsin D	3	3	250	0.0040	3.1	Protease
SBSN	Suprabasin	3	3	236	0.0122	6.1	Miscellaneous
MFGE8	Lactadherin	3	3	172	0.0085	3.0	Cell adhesion
HSPG2	Basement membrane-specific heparan sulfate proteoglycan core protein	2	2	164	0.0070	4.0	Miscellaneous
LGALS1	Galectin-1	2	2	136	0.0347	1.8	Apoptosis
PLTP	Phospholipid transfer protein	2	2	123	0.0390	2.7	Lipid transport
LGALS3	Galectin-3-like	2	2	103	0.0133	4.7	Cell adhesion
LAMA5	Laminin subunit alpha-5 isoform 1	1	1	93	0.0233	1.9	Cell proliferation
CSF1	Macrophage colony-stimulating factor 1 isoform 1	1	1	84	0.0188	2.1	Growth factor
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	1	1	67	0.0493	2.0	Serine-type endopeptidase inhibitor activity
PCOLCE2	Procollagen C-endopeptidase enhancer 2	1	1	64	0.0101	2.7	Miscellaneous
COL3A1	Collagen alpha-1(III) chain-like isoform 1	1	1	63	0.0034	3.2	Miscellaneous
PPIA	Peptidyl-prolyl cis-trans isomerase A	1	1	62	0.0309	3.7	Protein folding
GRN	granulins isoform 1	1	1	60	0.0000	5.5	Apoptosis
ANXA2	Annexin A2	1	1	58	0.0311	34.6	Membrane binding protein
NUCB2	Nucleobindin-2-like	1	1	55	0.0050	Infinity	Calcium-binding protein
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	54	0.0081	Infinity	Proteolysis
CTSB	Cathepsin B-like	1	1	53	0.0039	2.3	Protease
MAN2B2	Epididymis-specific alpha-mannosidase	1	1	44	0.0421	2.8	Glycosidase
Psap	Sulfated glycoprotein 1	1	1	43	0.0478	5.1	Miscellaneous

Table 3.2.25: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which decreased at 120hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of conditioned media from a CHO K1 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
SEMA3E	Semaphorin-3E	3	3	188	0.0028	2.5	Miscellaneous
SEMA3C	Semaphorin-3C	2	2	146	0.0262	2.2	Miscellaneous
PLA2G7	Platelet-activating factor acetylhydrolase-like	2	2	128	0.0041	5.4	Lipid metabolism
PTX3	Pentraxin-related protein PTX3	2	2	127	0.0140	2.5	Miscellaneous
SEMA3B	Semaphorin-3B	2	2	99	0.0064	2.4	Cell cell signaling
LGALS3BP	Galectin-3-binding protein-like	1	1	89	0.0294	22.4	Cell adhesion
SDC4	Syndecan-4-like	1	1	84	0.0085	13.8	Signal transduction
AGT	Angiotensinogen	1	1	76	0.0182	4.6	Miscellaneous
PRSS35	Inactive serine protease 35	1	1	73	0.0288	1.9	Metabolic process
TGFB1	Transforming growth factor beta-1	1	1	67	0.0010	1.9	Growth factor
PRDX4	Peroxiredoxin-4-like	1	1	60	0.0391	2.0	Oxidoreductase
SERPINE1	Plasminogen activator inhibitor 1	1	1	56	0.0408	3.2	Protease inhibitor
EMILIN1	EMILIN-1	1	1	56	0.0011	2.0	Cell adhesion
TIMP1	Metalloproteinase inhibitor 1-like	1	1	54	0.0153	5909.1	MMP inhibitor
CDNF	Cerebral dopamine neurotrophic factor-like	1	1	53	0.0044	3.9	Growth factor
CTGF	Connective tissue growth factor	1	1	53	0.0040	20.7	Cell proliferation
GPC1	Glypican-1	1	1	45	0.0403	275.1	Axon guidance
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	1	1	43	0.0001	8.6	Protease
OLFML2B	Olfactomedin-like protein 2B	1	1	41	0.0430	5.8	Miscellaneous

Table 3.2.26: HCPs from non-producing CHO K1 cell culture supernatant identified with one or more peptides as being common to 37˚C and 31˚C cultures. Proteins identified with two or more peptides as being common to 37˚C and 31˚C cultures are also indicated.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
YWHAB	14-3-3 protein beta/alpha isoform 2	7.79	2	13.4	88	27.8	4.8	x
YWHAE	14-3-3 protein epsilon, partial	49.52	5	11.2	121	11.9	5.8	x
YWHAH	14-3-3 protein eta	8.05	2	8.1	73	27.1	5.0	x
YWHAQ	14-3-3 protein theta	13.88	2	7.8	154	27.7	4.8	x
YWHAZ	14-3-3 protein zeta/delta	12.24	2	25.7	159	27.7	4.8	x
PSMD4	26S proteasome non-ATPase regulatory subunit 4	5.79	2	10.7	124	41.1	4.8	
PSMD9	26S proteasome non-ATPase regulatory subunit 9	5.41	1	2.7		24.6	6.7	
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	5.0		42.3	8.0	
PPID	40 kDa peptidyl-prolyl cis-trans isomerase	4.09	1	2.2		24.0	6.0	
RPS12	40S ribosomal protein S12	8.26	1	2.2		13.5	7.9	
RPS15A	40S ribosomal protein S15a	17.69	2	7.7	66	14.8	10.1	x
RPS16	40S ribosomal protein S16	10.22	1		43	15.7	10.2	
RPS18	40S ribosomal protein S18	17.70	2	5.4	47	13.1	9.9	x
RPS19	40S ribosomal protein S19, partial	16.91	2	11.9		15.1	10.5	x
RPS2	40S ribosomal protein S2	7.85	2	74.1	228	31.2	10.2	x
RPS20	40S ribosomal protein S20	11.03	2	3.8	60	15.2	9.9	x
RPS21	40S ribosomal protein S21	28.92	2	3.2	66	9.1	8.3	x
RPS23	40S ribosomal protein S23	7.75	1	3.2	56	15.9	9.9	
RPS25	40S ribosomal protein S25	16.26	2	6.9	52	13.5	10.1	x
RPS26	40S ribosomal protein S26	10.47	1	2.3	41	9.7	9.9	
RPS27	40S ribosomal protein S27	22.41	1	3.1	52	6.8	8.0	
RPS3	40S ribosomal protein S3	15.38	3	12.6	131	27.0	9.3	x
RPS3A	40S ribosomal protein S3a	8.42	1		53	10.8	10.1	
RPS3A	40S ribosomal protein S3a, partial	16.83	2	4.7	51	11.4	9.9	x
RPS4X	40S ribosomal protein S4, X isoform	3.44	1	2.6	47	29.2	10.3	
RPS6	40S ribosomal protein S6	7.34	2	6.5	50	24.9	11.0	x
RPS8	40S ribosomal protein S8	11.54	2	5.5	49	24.2	10.3	x
RPS9	40S ribosomal protein S9	13.85	2	4.9		14.8	10.8	x
RPSA	40S ribosomal protein SA	16.76	2	6.3	116	19.7	9.3	x
SDF4	45 kDa calcium-binding protein	13.24	2	10.8	104	41.2	4.9	x

RPLP0	60S acidic ribosomal protein P0	7.72	2	12.0	78	29.9	8.5	x
RPLP2	60S acidic ribosomal protein P2	53.91	3	16.5	141	11.7	4.5	x
RPL11	60S ribosomal protein L11	13.77	2	6.4	73	19.0	9.8	x
RPL12	60S ribosomal protein L12	22.32	2	8.2	99	12.2	10.1	x
RPL13	60S ribosomal protein L13	11.34	2	6.2	73	22.4	11.8	x
RPL13A	60S ribosomal protein L13a	9.40	1	2.7	54	13.6	10.6	
RPL14	60S ribosomal protein L14	4.49	1	3.1	61	29.5	11.0	
RPL15	60S ribosomal protein L15, partial	8.08	2	4.8		23.5	11.6	x
RPL19	60S ribosomal protein L19	15.52	1	2.7	48	6.9	9.8	
RPL23	60S ribosomal protein L23	12.35	1	5.4		9.0	9.8	
RPL23A	60S ribosomal protein L23a	26.92	3	9.7	57	17.7	10.4	x
RPL26	60S ribosomal protein L26	11.03	2	4.7		17.2	10.7	
RPL27	60S ribosomal protein L27	15.45	2	7.1	45	12.1	10.1	x
RPL29	60S ribosomal protein L29	16.67	1		48	12.4	11.5	
RPL3	60S ribosomal protein L3	5.21	2	5.7	49	46.1	10.2	x
RPL30	60S ribosomal protein L30	12.77	2	6.7		10.5	9.3	
RPL31	60S ribosomal protein L31	7.20	1	2.5	58	14.3	10.0	
RPL5	60S ribosomal protein L5	12.96	4	11.6	65	43.4	9.8	x
Rpl6	60S ribosomal protein L6	9.62	2	6.7		32.8	10.5	x
RPL7	60S ribosomal protein L7	12.94	1	3.5	64	10.0	10.0	
RPL7A	60S ribosomal protein L7a	20.00	2	6.8	62	15.6	11.4	x
PGD	6-phosphogluconate dehydrogenase, decarboxylating	5.80	2	13.0	208	53.3	6.6	x
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	2.98	2	5.1	43	77.3	7.6	x
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7	1.42	2	7.0	80	177.6	5.8	x
ACAT2	acetyl-CoA acetyltransferase, cytosolic	7.05	2		75	41.0	7.3	x
ASAH1	acid ceramidase	6.33	2	14.6	100	44.7	7.9	x
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	2	5.7	76	28.5	4.1	x
ACTA1	actin, alpha skeletal muscle	25.99	1	55.7	444	42.0	5.4	
ACTA1	actin, alpha skeletal muscle A	12.64	1	50.9	243	9.7	8.5	
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4	x
ACTR3B	Actin-related protein 3B	3.03	1	2.7	49	41.7	6.6	
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.80	2	6.8		38.1	5.5	
DBI	acyl-CoA-binding protein	20.93	2	5.3		9.9	8.8	x
CRKL	adapter molecule crk	11.31	2	8.4	54	36.1	5.7	x
APRT	adenine phosphoribosyltransferase	13.89	2	3.5	64	19.4	6.0	x
AHCY	adenosylhomocysteinase	7.64	3	9.8	100	47.6	6.5	x

AK2	Adenylate kinase 2, mitochondrial	16.20	2	4.6		15.4	7.9	x
ADSL	Adenylosuccinate lyase	4.55	2	6.4	80	54.9	6.9	x
CAP1	adenylyl cyclase-associated protein 1 isoform 1	5.70	2	6.5	90	51.5	7.3	x
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0	x
AARS	alanyl-tRNA synthetase, cytoplasmic	2.89	2	2.6	41	106.8	5.6	x
AKR1A1	alcohol dehydrogenase	14.20	4	14.1	109	36.5	7.1	x
AKR1B10	Aldo-keto reductase family 1 member B10	6.14	1	7.5		31.5	9.1	
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6	x
AKR1B1	aldose reductase	6.96	2	6.2	86	35.8	7.4	x
ACTN1	Alpha-actinin-1	3.77	2	13.3	157	104.5	5.8	x
ACTN4	Alpha-actinin-4	19.23	2	6.5	88	26.2	4.8	x
ENO1	alpha-enolase	9.79	3	61.7	591	46.7	6.2	x
GLA	Alpha-galactosidase A	2.64	1	2.5		38.5	5.0	
IDUA	Alpha-L-iduronidase	3.84	2	2.5	42	70.2	6.6	x
NAGA	alpha-N-acetylgalactosaminidase	6.75	2	12.1	157	47.2	7.8	x
NAGLU	alpha-N-acetylglucosaminidase	2.84	2	3.2	61	83.4	6.7	x
APP	amyloid beta A4 protein	2.79	2	100.7	1011	85.0	4.9	x
APLP2	Amyloid protein 2	2.93	2	27.5	188	78.3	4.9	x
ANXA1	annexin A1	11.85	3	88.1	554	38.8	7.0	x
ANXA2	annexin A2, partial	14.54	2	13.5	245	25.4	6.0	x
ANXA5	annexin A5	8.72	2	6.3	58	36.0	5.0	x
ANXA6	annexin A6 isoform 2	1.63	1	5.2	42	76.1	5.6	
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2, partial	1.21	1	2.4		72.1	6.1	
ARSA	arylsulfatase A	4.63	2	14.4	156	55.0	5.1	x
GOT1	aspartate aminotransferase, cytoplasmic	6.30	2	7.2	79	46.2	7.2	x
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.18	2	4.6		54.4	6.4	
DHX9	ATP-dependent RNA helicase A	1.30	2	7.8	90	144.3	6.9	x
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	1.45	4	245.3	2901	471.6	6.5	x
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8	x
GLB1	Beta-galactosidase	3.85	2	6.5	109	73.6	6.9	x
GUSB	beta-glucuronidase	5.86	3	10.8	86	74.8	6.8	x
HEXA	beta-hexosaminidase subunit alpha	2.08	1	2.5		60.6	6.5	
HEXB	Beta-hexosaminidase subunit beta	3.80	2	21.7	40	60.1	7.4	x
BLVRA	biliverdin reductase A	4.75	1	3.4	59	33.2	6.1	
BTD	biotinidase	5.21	2	8.7	117	60.1	6.1	x
BMP1	bone morphogenetic protein 1	2.34	2	7.7		106.1	7.2	x

PRSS22	brain-specific serine protease 4	5.54	2	6.2	42	41.2	7.3	x
BAZ2B	Bromodomain adjacent to zinc finger domain protein 2B	0.54	1	2.3		205.6	6.1	
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic	2.88	2	6.0	71	101.2	7.8	x
P15156	calcium-dependent serine proteinase	4.17	2	8.2	62	77.4	4.8	x
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3	x
CALM1	calmodulin	22.15	2	4.0	62	16.7	4.4	x
CAST	calpastatin	3.38	2	7.3	59	82.8	5.3	x
CALR	Calreticulin	4.32	2	7.2	41	48.2	4.5	x
CLSTN1	Calsyntenin-1	3.25	2	2.7	66	92.2	4.8	x
CALU	calumenin	9.84	2	7.5		37.0	4.7	x
CAPRIN1	Caprin-1	3.35	2	7.2	86	73.6	5.2	
CHST14	carbohydrate sulfotransferase 14	5.59	1	3.8		43.0	9.2	
CBR1	Carbonyl reductase	19.05	2	5.3	48	13.7	7.3	x
CPD	Carboxypeptidase D	0.90	1	2.8	59	123.4	6.2	
CAT	catalase	5.50	2	3.2	73	60.0	7.7	x
CTSB	cathepsin B	14.45	3	30.6	229	37.5	6.1	x
CTSD	cathepsin D	23.53	6	14.1	235	44.1	7.0	x
CTSL1	cathepsin L1	14.41	3	138.5	754	37.2	7.2	x
CCL2	c-C motif chemokine 2	11.89	2	2.3	77	15.8	9.2	x
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2	x
CD44	CD44 antigen isoform 5	5.85	2	8.4	95	39.4	5.9	x
P21926	CD9 antigen	6.29	1	3.1		17.7	6.7	
CLN5	Ceroid-lipofuscinosis neuronal protein 5	3.30	1	2.4		32.0	6.1	
CLIC1	chloride intracellular channel protein 1	9.96	2	5.9	90	26.9	5.2	x
CLIC4	Chloride intracellular channel protein 4	5.69	1		43	24.1	6.4	
CSPG4	chondroitin sulfate proteoglycan 4	1.21	2	36.2	231	251.9	5.7	x
CBX1	chromobox protein homolog 1	14.05	2	7.5	50	21.4	4.9	x
CBX3	chromobox protein homolog 3	14.75	2	7.8		20.8	5.3	
CLTC	clathrin heavy chain 1	0.66	1	3.1		191.6	5.8	
CLU	clusterin	5.62	2	129.7	1923	51.5	5.8	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	12.02	2	11.4	99	23.9	9.6	x
CFL1	cofilin-1	31.93	3	20.4	244	18.5	8.1	x
CCDC80	coiled-coil domain-containing protein 80	14.87	10	42.3	448	107.4	9.7	x
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6	x
COL5A1	collagen alpha-1(V) chain	1.82	1		45	41.8	9.2	
COL6A1	Collagen alpha-1(VI) chain	4.14	3	47.9	770	88.9	6.6	x

COL5A2	collagen alpha-2(V) chain	3.67	4	13.2	98	145.0	6.0	x
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	5.35	1	2.4		25.3	6.4	
C1ra	Complement C1r-A subcomponent	11.63	4	7.5	196	80.0	6.1	x
C3	Complement C3	3.38	4	11.9	83	182.1	6.7	x
CFH	complement factor H, partial	2.43	1		50	69.5	6.8	
CORO1B	coronin-1B	3.51	2	3.2	60	53.8	5.8	x
ABRACL	costars family protein C6orf115 homolog	11.11	1	2.6		9.0	5.8	
CAND1	cullin-associated NEDD8-dissociated protein 1	0.91	1	5.4		133.5	5.7	
CXCL3	C-X-C motif chemokine 3 precursor	9.90	1	3.1		11.0	8.8	
CSTB	cystatin-B	9.18	1	2.4		11.2	7.4	
CSRP1	cysteine and glycine-rich protein 1	7.77	1	4.0	75	20.5	8.6	
CRIP2	cysteine-rich protein 2	10.58	1		42	22.7	8.6	
Cycs	cytochrome c, somatic	23.81	2	6.6	86	11.7	9.5	x
LAP3	Cytosol aminopeptidase	6.71	3	8.5	103	50.2	6.9	x
CNDP2	cytosolic non-specific dipeptidase	5.89	2	8.8		52.8	5.9	x
PHGDH	d-3-phosphoglycerate dehydrogenase	4.88	2	7.1	82	56.5	6.9	x
DDT	D-dopachrome decarboxylase	16.95	2		99	13.1	7.1	x
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7	x
DCN	decorin	14.92	3	96.3	789	40.1	8.4	x
DNASE2	deoxyribonuclease-2-alpha	6.20	2	5.9	59	40.4	7.5	x
DPT	dermatopontin	5.47	1	3.1	52	24.0	4.9	
DSTN	destrin	6.67	1	6.5	72	18.6	7.7	
DKK3	dickkopf-related protein 3	10.06	2	11.5	233	38.3	4.5	x
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4	x
DPP7	dipeptidyl peptidase 2	5.14	2	7.0	92	56.4	6.5	x
DPP3	dipeptidyl peptidase 3	7.05	3	12.5	119	82.9	5.2	x
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5	x
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	3.49	2	7.4		83.8	7.8	x
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	1.36	1	4.2	48	106.2	7.5	
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	1.34	1	2.7	41	91.2	6.6	
DDB1	DNA damage-binding protein 1	2.54	3	7.4		126.8	5.3	x
MCM2	DNA replication licensing factor MCM2	2.43	2	7.0	91	102.1	5.6	
MCM3	DNA replication licensing factor MCM3	2.11	1	3.8		90.7	5.5	
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4	
DAG1	Dystroglycan	5.38	3	10.5	120	96.8	8.5	x
NEDD4	E3 ubiquitin-protein ligase NEDD4	3.07	2	2.8	72	108.4	5.7	

EFHD2	EF-hand domain-containing protein D2	20.86	2	7.7	84	15.9	5.3	x
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0	x
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	2.93	1	3.0		42.0	5.4	
ELAVL1	ELAV protein 1	3.88	1	3.5	72	37.1	9.2	
EEF1A1	elongation factor 1-alpha 1	5.84	2	171.6	1456	50.1	9.0	x
EEF1B2	elongation factor 1-beta	5.78	1	4.0	74	24.7	4.7	
EEF1D	elongation factor 1-delta isoform 1	12.81	2	3.8	98	31.3	5.1	x
EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0	x
EEF1G	elongation factor 1-gamma	5.26	2	7.2	86	50.0	6.8	x
EEF2	Elongation factor 2	2.68	2	21.2	68	95.2	6.6	x
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4	x
HSP90B1	endoplasmin	4.11	2	14.1	95	92.6	4.8	x
EDF1	Endothelial differentiation-related factor 1	14.15	1	12.1	70	11.7	10.0	
NPC2	epididymal secretory protein E1	6.04	1	2.3		16.5	8.0	
MAN2B2	Epididymis-specific alpha-mannosidase	2.99	2	7.6	69	111.3	7.5	x
EIF4A1	Eukaryotic initiation factor 4A-I	6.96	2	6.4	71	40.8	5.5	x
EIF4A3	Eukaryotic initiation factor 4A-III	6.45	1	5.1		32.4	7.0	
ETF1	eukaryotic peptide chain release factor subunit 1	3.22	1	3.4	54	45.4	5.5	
EIF2S1	eukaryotic translation initiation factor 2 subunit 1	6.98	2	6.2	91	36.1	5.1	x
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	2.12	1		62	51.1	8.4	
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.12	2	8.5	75	91.4	5.1	
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8	x
EIF3I	eukaryotic translation initiation factor 3 subunit I	8.62	2	7.2	55	36.3	5.6	x
EIF3L	eukaryotic translation initiation factor 3 subunit L	1.42	1	2.9	48	66.6	6.3	
EIF4B	eukaryotic translation initiation factor 4B	1.31	1	2.6	53	69.0	5.9	
EIF5A	Eukaryotic translation initiation factor 5A-1	19.70	2	10.1	116	7.2	6.5	x
EIF6	eukaryotic translation initiation factor 6	7.35	1		47	26.6	4.7	
ECM1	extracellular matrix protein 1	4.09	2	7.0	70	63.2	6.8	x
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0	
CAPZB	F-actin-capping protein subunit beta	11.63	2	9.0	42	29.0	7.7	x
FDPS	Farnesyl pyrophosphate synthetase	5.87	2	8.1	60	43.2	7.8	x
FASN	fatty acid synthase	1.20	2	6.8	49	271.7	6.4	x
FABP4	fatty acid-binding protein, adipocyte	20.45	2	6.8	94	14.7	7.9	
FTH1	Ferritin heavy chain	10.75	2		61	21.5	6.2	x
FN1	fibronectin isoform 2	5.36	9	37.6	398	262.9	5.9	x
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2	x

FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8	x
FLNB	filamin-B isoform 3	0.85	2	5.4	43	275.1	5.7	x
FKBP4	FK506-binding protein 4	5.60	2	6.9	84	46.6	5.8	x
FSTL1	follistatin-related protein 1	9.48	2	10.2	220	34.6	5.7	x
ALDOA	fructose-bisphosphate aldolase A isoform 1	15.38	4	15.5	197	39.4	8.1	x
LGALS3BP	galectin-3-binding protein	10.63	4	74.6	1192	63.8	5.2	x
IFI30	gamma-interferon-inducible lysosomal thiol reductase	6.10	1	3.5	84	27.4	5.2	
GM2A	ganglioside GM2 activator	5.76	2	5.8	45	20.8	6.7	x
GPI	glucose-6-phosphate isomerase	3.23	2	5.2	50	63.0	7.6	
PRKCSH	glucosidase 2 subunit beta isoform 2	7.24	4	12.9		59.1	4.5	
GBA	glucosylceramidase	4.47	2	31.1	67	57.4	8.1	x
GLRX3	glutaredoxin-3	3.83	1	2.4		32.5	5.7	
Gsta5	Glutathione S-transferase alpha-5	7.03	1	2.5		14.5	6.8	
GSTM2	glutathione S-transferase Mu 2	22.00	0	9.5	106	23.6	5.1	
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4	
GSTP1	glutathione S-transferase P 1	12.86	2	6.7	288	23.6	7.8	x
Q00285	glutathione S-transferase Y1	11.01	2	53.3	299	26.0	8.4	x
GSS	glutathione synthetase	3.59	2	5.0		52.2	5.6	x
GAPDH	glyceraldehyde-3-phosphate dehydrogenase	24.51	2	4.3	167	27.9	8.3	x
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	6.81	1	2.9		21.9	5.2	
GARS	glycyl-tRNA synthetase	3.10	2	5.9	53	79.8	6.8	x
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5	
GPC1	glypican-1	7.66	4	19.6	254	78.5	7.3	x
GLG1	Golgi apparatus protein 1 precursor	2.67	2	10.9	88	132.2	6.8	x
GOLM1	Golgi membrane protein 1	12.73	1		44	12.5	8.2	
GPR56	G-protein coupled receptor 56	3.20	2	32.4	290	77.3	8.8	x
GRN	granulins isoform 3	4.74	2	15.2	95	57.0	6.5	x
RAN	GTP-binding nuclear protein Ran	17.59	2	10.6	98	24.5	7.0	x
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	2.8	59	30.5	5.2	
GNB2L1	Guanine nucleotide-binding protein subunit beta-2 1	8.33	2	8.7	54	30.4	7.4	x
Cd74	H-2 class II histocompatibility antigen gamma chain	9.73	2	2.4	43	36.3	8.7	x
HSPA13	heat shock 70 kDa protein 13	3.30	2	6.4		63.2	8.5	x
HSPA4	heat shock 70 kDa protein 4	2.98	2	6.6	73	90.4	5.2	x
HSPA8	heat shock cognate 71 kDa protein	11.30	5	159.3	2185	70.8	5.4	x
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5	
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0	x

HSP90AB1	heat shock protein HSP 90-beta	8.15	2	113.3	679	83.1	5.0	x
HPSE	heparanase	4.83	2	6.3		60.9	9.0	x
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	17.54	2	10.8	137	23.7	9.6	x
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	6.9	111	11.3	9.9	
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	8.13	2	15.1	183	34.2	9.2	x
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	17.81	2	7.3	62	16.4	8.3	x
HNRNPC	heterogeneous nuclear ribonucleoprotein C 1 isoform 1	7.97	2	7.2	134	33.1	5.0	x
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C 1 isoform 2	14.97	4	12.1	96	32.4	5.1	x
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	8.56	2	10.4	109	29.3	9.3	x
RBMX	heterogeneous nuclear ribonucleoprotein G	7.27	2	5.9	115	31.5	9.8	x
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	6.27	2	3.2	54	45.2	7.6	
HNRNPK	heterogeneous nuclear ribonucleoprotein K isoform 4	5.92	2	6.7	84	48.5	5.9	x
HNRNPL	heterogeneous nuclear ribonucleoprotein L	3.61	1	4.7		54.2	5.6	
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	3.38	2	5.7	60	62.6	7.6	x
HNRNPU	Heterogeneous nuclear ribonucleoprotein U	5.27	2	7.1	115	57.6	9.3	x
HNRNPA2B1	heterogeneous nuclear ribonucleoproteins A2/B1	6.44	2	5.3	40	37.8	9.2	x
HMGB1	High mobility group protein B1	13.30	2	2.8	84	23.5	6.3	x
HMGB2	High mobility group protein B2	10.69	2	5.0		18.2	5.4	
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1		64	8.0	6.8	
H1F0	histone H1.0	11.34	2	6.4	100	20.9	10.9	x
HIST1H2AG	Histone H2A type 1	6.34	2	113.3	1406	34.2	11.1	x
HIST1H2AG	Histone H2B type 1	26.98	2	6.3	155	13.9	10.3	x
Hist3h2ba	histone H2B type 3-A	11.90	1	15.2	304	14.0	10.4	
HIST1H3A	Histone H3	19.85	2	20.3	231	29.6	11.1	x
HIST1H4A	Histone H4	24.62	4	21.1	215	21.8	10.7	x
RBBP4	Histone-binding protein RBBP4	4.04	1		40	25.3	6.3	
RBBP7	histone-binding protein RBBP7	2.05	1	2.2		43.6	5.1	
ST13	Hsc70-interacting protein	18.55	2	7.1	58	13.9	6.8	x
CDC37	hsp90 co-chaperone Cdc37	8.71	2	6.9		44.4	5.3	x
HAPLN1	hyaluronan and proteoglycan link protein 1	2.54	1	2.2		40.3	7.8	
HAPLN4	hyaluronan and proteoglycan link protein 4	6.39	2	7.3	99	46.2	8.0	x
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic	3.85	2	5.6	87	57.3	5.7	x
HMGCS2	hydroxymethylglutaryl-CoA synthase, mitochondrial	2.17	1	3.4	54	57.2	8.6	
N/A	hypothetical protein I79_015376	2.46	4	10.3	114	231.1	5.6	
N/A	hypothetical protein LOC100766349	10.13	2	10.0	131	25.5	9.9	x
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.3	72	19.7	8.7	x

HPRT1	hypoxanthine-guanine phosphoribosyltransferase	10.75	2	6.5	116	24.2	7.0	x
HYOU1	Hypoxia up-regulated protein 1	1.90	2	4.9	55	111.4	5.2	x
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0	x
KPNB1	Importin subunit beta-1	1.64	2	8.5	109	211.1	4.9	x
IPO5	importin-5	1.87	2	5.7	53	120.3	4.9	x
IPO7	importin-7	0.87	1	2.4		119.4	4.8	
PRSS35	inactive serine protease 35	3.88	1	4.6	71	46.0	9.7	
PPA1	Inorganic pyrophosphatase	5.47	2	2.3	52	37.0	5.3	x
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	6.03	2	10.4	43	55.9	7.3	x
ISYNA1	Inositol-3-phosphate synthase 1	8.37	2	3.1	81	46.9	5.7	x
IGFBP4	insulin growth factor-binding protein 4	4.72	2	4.5		27.7	7.1	x
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	2.52	2	105.6	915	102.0	8.6	x
IFNAR2	Interferon-alpha/beta receptor beta chain	5.14	1	3.8	82	28.7	5.6	
ILF2	Interleukin enhancer-binding factor 2	8.85	1	5.9	88	12.8	9.2	
ILF3	interleukin enhancer-binding factor 3	3.12	2	6.0	75	95.8	8.7	
IDH1	Isocitrate dehydrogenase	10.21	2	6.2	48	26.4	6.3	
IDI1	isopentenyl-diphosphate Delta-isomerase 1	5.29	1	3.0	52	26.3	5.9	
KDELC2	KDEL motif-containing protein 2	1.99	1		41	52.4	7.5	
KRT77	Keratin, type II cytoskeletal 1b	5.27	2	11.5	108	93.4	5.5	x
MFGE8	Lactadherin	40.00	5	24.8	300	16.1	9.4	x
MFGE8	lactadherin, partial	15.38	4	29.5	399	32.3	5.7	x
GLO1	lactoylglutathione lyase	9.24	2	5.1	45	20.9	5.3	
LMNA	Lamin-A/C	14.92	7	20.6	242	64.0	8.0	x
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.7	63	34.9	5.9	
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2	
LAMA3	laminin subunit alpha-3	0.34	1	3.7	50	350.8	6.8	
LAMA5	laminin subunit alpha-5 isoform 1	0.62	2	47.4	637	405.6	6.9	x
LAMB1	Laminin subunit beta-1	1.36	2	58.6	839	178.0	4.9	x
LAMC1	laminin subunit gamma-1	7.57	10	40.2	538	172.0	5.1	x
N/A	Lamin-L(I)	4.76	2	6.9	72	54.9	4.9	
LTBP1	Latent-transforming growth factor beta-binding protein 1	2.01	2	3.0	57	130.0	5.1	x
LGMN	legumain	18.26	6	25.8	290	49.6	6.6	x
SERPINB1	leukocyte elastase inhibitor A	7.39	2	116.1	1236	42.9	6.2	x
LTA4H	leukotriene A-4 hydrolase	2.13	1	3.1	48	69.1	6.3	
LASP1	LIM and SH3 domain protein 1	14.98	3	9.7	63	25.8	5.9	x
LPL	Lipoprotein lipase	29.11	10	47.1	568	50.5	7.9	x

LDHA	L-lactate dehydrogenase A chain	14.16	4	19.8	264	36.5	7.4	x
LDLR	low-density lipoprotein receptor precursor	2.69	2	7.0	89	94.5	4.9	x
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase	4.79	2	6.4		45.6	7.7	x
GAA	lysosomal alpha-glucosidase	2.11	2	6.9	108	105.8	6.0	x
MAN2B1	lysosomal alpha-mannosidase	1.98	2	5.0	72	113.9	7.9	x
CTSA	Lysosomal protective protein	12.21	5	24.0	159	54.2	6.1	x
PRCP	lysosomal Pro-X carboxypeptidase	2.85	1	2.8	43	55.4	6.7	
LOXL4	Lysyl oxidase 4	2.91	2	32.6	364	84.7	8.0	x
LOXL3	lysyl oxidase homolog 3	3.60	2		85	83.1	6.9	x
KARS	lysyl-tRNA synthetase isoform 1	6.20	2	4.3	61	67.9	6.2	x
CSF1	macrophage colony-stimulating factor 1 isoform 2	7.39	2		64	29.5	7.4	x
MIF	macrophage migration inhibitory factor	9.57	1		63	12.4	7.3	
CAPG	macrophage-capping protein	11.17	3	9.9	136	38.7	6.7	x
MDH1	malate dehydrogenase, cytoplasmic	6.59	2	5.8		36.4	6.6	x
MAMDC2	MAM domain-containing protein 2	1.92	1	2.6	46	53.3	5.7	
EPDR1	Mammalian ependymin-related protein 1	8.30	2	5.7	91	27.5	6.7	x
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	5.89	2	5.3	43	56.0	6.5	x
MMP19	matrix metalloproteinase-19	5.90	2	32.8	321	58.9	7.9	x
MMP9	matrix metalloproteinase-9	6.76	4	13.3	183	78.8	5.9	x
Rpl18	mCG132477, isoform CRA_c	9.56	1	5.5	71	15.2	11.8	
TIMP1	metalloproteinase inhibitor 1	18.72	3	17.9	190	22.4	8.5	x
TIMP2	Metalloproteinase inhibitor 2	12.04	2	10.0	104	21.5	7.5	x
MSN	moesin	10.60	3	20.9	149	66.5	6.3	x
MINPP1	Multiple inositol polyphosphate phosphatase 1	3.28	1	2.3	43	31.6	6.2	
MYL6	Myosin light polypeptide 6	18.42	2	7.1	74	17.3	4.6	x
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8	
MYH9	myosin-9	0.74	1	8.3		217.6	5.6	
MTPN	myotrophin	17.53	1	4.4	93	10.4	6.5	
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 1	7.51	2	11.9	90	37.2	7.5	x
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	8.14	2	7.4	43	34.2	6.9	x
GNS	N-acetylglucosamine-6-sulfatase	4.64	2	5.5	42	53.7	6.9	x
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	3.86	1	4.7	89	47.5	7.5	
PGLYRP2	N-acetylmuramoyl-L-alanine amidase	2.02	1	2.9	42	64.8	6.9	
NACA	nascent polypeptide-associated complex subunit alpha	20.47	3	13.9	179	23.4	4.6	x
NEO1	Neogenin	1.42	2	5.0		154.4	6.6	x
NTN4	Netrin-4	4.01	2	5.1	71	64.0	8.1	x

NENF	neudesin	11.29	2	2.7	45	20.4	7.8	
NCAM1	Neural cell adhesion molecule 1	1.96	2	6.0	65	114.2	4.8	x
NRP1	neuropilin-1	3.90	2	7.6	98	103.0	5.9	x
GANAB	neutral alpha-glucosidase AB isoform 2	3.39	2	8.5	41	106.9	6.0	
NCEH1	neutral cholesterol ester hydrolase 1	1.94	1	3.2	54	68.3	7.8	
NHP2L1	NHP2 protein 1	16.44	1	2.9	63	8.0	7.9	
NID1	Nidogen-1	12.72	5	17.2	221	79.0	4.9	x
Nid1	nidogen-1, partial	8.08	3	102.8	1381	54.6	6.4	x
NONO	Non-POU domain-containing octamer-binding protein	4.89	2	9.7	44	69.6	5.2	x
SCP2	non-specific lipid-transfer protein	1.83	1	2.3		58.9	7.4	
NSFL1C	NSFL1 cofactor p47 isoform 2	8.38	2	9.1	190	40.7	5.1	x
SGSH	N-sulphoglucosamine sulphohydrolase	4.58	2	6.5	73	56.5	6.5	x
NASP	nuclear autoantigenic sperm protein	2.47	2	5.5	56	83.4	4.4	x
NUDC	Nuclear migration protein nudC	9.22	2	7.7	63	32.8	6.0	x
YBX1	nuclease-sensitive element-binding protein 1	19.58	3	17.9	306	38.3	10.2	x
NUCB1	Nucleobindin-1	38.52	4	13.6	131	13.8	4.8	x
NUCB2	nucleobindin-2	20.24	8	40.7	326	50.3	5.1	x
NCL	Nucleolin	3.97	2	38.5	478	52.4	4.5	x
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7	x
NPM1	Nucleophosmin	10.71	2	5.1	85	31.0	4.7	x
NME1	nucleoside diphosphate kinase A isoform 1	31.58	2	7.5	110	17.2	6.3	x
NME2	nucleoside diphosphate kinase B	28.29	2	4.9	90	17.3	8.0	x
NAP1L4	Nucleosome assembly protein 1 4	7.83	2	8.6		39.4	4.7	x
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9	x
OLFML3	Olfactomedin protein 3	7.39	2	7.3	53	45.9	6.2	x
OR10X1	olfactory receptor 10X1	3.23	1	8.2		34.4	8.6	
Q86UD1	Out at first protein	14.47	2	4.5		17.7	8.1	
OAF	out at first protein homolog	9.13	2	6.7	40	29.7	8.3	x
PALLD	Palladin	3.17	1	2.3		42.1	8.6	
PPT1	palmitoyl-protein thioesterase 1	10.78	2	2.5	85	34.5	7.9	x
VNN1	pantetheinase	2.54	1	2.9	45	56.7	5.6	
PAPLN	Papilin	2.89	2		79	127.2	7.3	x
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4	x
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	2.59	2	7.0		94.7	6.5	x
PPIA	Peptidyl-prolyl cis-trans isomerase	14.63	2	179.6	1829	17.9	8.3	x
PPIA	Peptidyl-prolyl cis-trans isomerase A	14.06	2	116.9	1144	14.1	6.8	x

PPIB	peptidyl-prolyl cis-trans isomerase B	10.19	2	72.0	765	23.6	9.6	x
PPIC	Peptidyl-prolyl cis-trans isomerase C	17.18	2	7.9	87	18.0	8.1	x
FKBP1A	peptidyl-prolyl cis-trans isomerase FKBP1A	24.05	2	7.8	90	8.8	7.4	
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3, partial	15.43	2	6.7		21.1	9.3	
FKBP9	peptidyl-prolyl cis-trans isomerase FKBP9	4.56	2	6.7		63.0	5.1	
PLIN4	perilipin-4	14.55	3	8.0	71	184.1	8.4	x
POSTN	periostin isoform 5	1.46	1	2.5		83.5	8.0	
PXDN	peroxidasin homolog	1.63	2	41.1	162	165.3	7.0	x
PRDX1	Peroxiredoxin-1	14.57	3	115.1	1041	22.2	7.7	x
PRDX4	peroxiredoxin-4	6.74	2	11.1	82	38.8	8.4	x
PRDX6	peroxiredoxin-6, partial	10.50	2	5.3	47	24.5	6.8	x
PEBP1	Phosphatidylethanolamine-binding protein 1	28.34	4	12.9	185	20.9	7.1	x
PGM1	Phosphoglucomutase-1	4.90	2	6.6	105	62.8	5.9	x
PGM2	phosphoglucomutase-2	1.45	1	2.3		69.0	6.3	
PGK1	phosphoglycerate kinase 1	7.91	2	12.5	112	44.5	7.9	x
PGAM1	Phosphoglycerate mutase 1	17.98	3	9.2	55	20.2	8.1	x
PLTP	phospholipid transfer protein	3.65	2	6.8		54.3	6.7	x
PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0	x
PSPH	phosphoserine phosphatase	7.56	2	4.8	46	25.0	5.5	x
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein	2.73	1	2.4		37.4	7.1	
SERPINF1	Pigment epithelium-derived factor	32.76	2	5.2	63	6.7	5.3	x
SERPINE1	Plasminogen activator inhibitor 1	3.33	1	2.7		30.7	6.2	
SERBP1	plasminogen activator inhibitor 1 RNA-binding protein	6.83	2	5.9		35.7	8.7	x
PLS3	plastin-3	3.81	2	6.0		70.8	5.7	x
PLA2G7	platelet-activating factor acetylhydrolase	5.78	2	2.5	42	39.1	8.4	x
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	0.86	1		43	129.5	6.3	
PLEC	plectin	0.81	3	13.2	59	533.6	5.9	x
PCBP2	Poly(rC)-binding protein 2	7.39	1	2.8		18.6	6.4	
PCBP2	poly(rC)-binding protein 2 isoform 4	9.63	2	3.4	71	33.9	8.2	x
PABPC1	Polyadenylate-binding protein 1	4.96	2	7.2	61	62.7	9.6	x
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6	x
N/A	polyubiquitin	32.81	2	9.8	110	42.9	7.6	x
PFDN1	prefoldin subunit 1	9.02	1	2.8	59	14.2	6.8	
PFDN2	prefoldin subunit 2	16.88	2	5.6	82	16.7	6.6	x
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	10.3	143	69.2	8.9	x
CTSH	pro-cathepsin H	6.31	2	5.6	47	37.4	8.5	x

PCOLCE	procollagen C-endopeptidase enhancer 1	16.45	6	39.8	441	50.4	7.9	x
PCOLCE2	Procollagen C-endopeptidase enhancer 2	3.02	1	3.2		40.3	9.3	
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	2.43	1	3.3	75	75.9	6.2	
PFN1	Profilin-1	45.45	2	5.9	44	6.0	9.9	x
PDCD5	programmed cell death protein 5	8.46	1	2.4	43	14.9	6.9	
PA2G4	proliferation-associated protein 2G4	10.66	3	5.8	67	43.7	6.7	x
PROSC	Proline synthetase co-transcribed bacterial protein	7.17	1	4.3	61	24.8	6.4	
LRP1	prolow-density lipoprotein receptor-related protein 1	0.24	1	2.4	45	504.3	5.4	
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7	x
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9	
PTGES3	prostaglandin E synthase 3	6.21	1	2.6		18.9	4.6	
PTGR1	prostaglandin reductase 1	5.47	2	6.5	77	35.7	7.2	x
PSME1	Proteasome activator complex subunit 1	9.77	2	6.9	84	24.5	5.4	x
PSME2	proteasome activator complex subunit 2 isoform 2	12.61	2	8.7	100	26.2	5.2	x
PSMA1	proteasome subunit alpha type-1	10.27	2	8.7	95	29.5	6.5	x
PSMA2	proteasome subunit alpha type-2	15.38	2	10.9	68	25.9	7.4	x
PSMA3	proteasome subunit alpha type-3	8.24	2	5.5	60	28.4	5.3	x
PSMA4	proteasome subunit alpha type-4	13.41	2	11.8	127	29.5	7.7	x
PSMA5	proteasome subunit alpha type-5	9.54	2	5.7		26.4	4.8	x
PSMA6	proteasome subunit alpha type-6, partial	5.91	1	3.4	77	24.4	6.6	
PSMA7	Proteasome subunit alpha type-7	13.68	2	7.7	137	23.8	8.5	x
PSMB3	Proteasome subunit beta type-3	26.92	1	3.9	49	5.7	9.0	
PSMB4	proteasome subunit beta type-4	5.68	1	4.3	52	29.2	5.5	
PSMB5	proteasome subunit beta type-5	4.94	1	3.4	58	28.7	7.0	
PSMB6	proteasome subunit beta type-6	8.97	2	6.5	96	24.7	5.1	x
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.52	2	7.2	66	40.5	5.6	x
CREG1	protein CREG1	4.55	1	2.7		24.1	8.0	
CYR61	protein CYR61	4.76	2	6.1	89	41.5	8.1	x
P4hb	Protein disulfide-isomerase	17.39	4	12.4	154	21.1	4.6	x
PDIA3	Protein disulfide-isomerase A3	5.18	2	9.6	145	50.0	5.7	x
PDIA4	protein disulfide-isomerase A4	4.98	2	3.2	77	72.5	5.2	
PDIA6	Protein disulfide-isomerase A6	11.20	2	47.6	708	28.4	4.9	x
PARK7	protein DJ-1	22.75	2	4.7	76	19.9	6.8	x
FAM3C	protein FAM3C	8.81	2	5.8	60	24.7	8.3	x
TTLL8	protein monoglycylase TTLL8	1.08	1	2.4		95.4	8.5	
PPM1G	Protein phosphatase 1G	2.22	1	2.5	44	54.0	4.3	

RCC2	Protein RCC2	3.77	1	3.6	49	31.9	7.0	
S100A10	protein S100-A10	10.31	1	3.1		11.2	6.8	
S100A11	protein S100-A11	26.00	2	7.3	95	11.2	7.1	x
S100A13	Protein S100-A13	21.43	2	8.0	50	11.2	5.3	x
S100A6	protein S100-A6	16.85	2	4.9	69	10.0	5.5	x
SET	protein SET	5.81	2	8.9	111	35.6	4.4	x
SHISA5	protein shisa-5	6.61	1	4.5		25.9	6.5	
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2	x
PNP	Purine nucleoside phosphorylase	7.07	2	4.7		31.4	6.7	x
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1	x
N/A	putative allantoicase	1.10	1	2.3	47	80.2	7.9	
PLBD2	putative phospholipase B 2	3.59	2	10.3	107	65.5	6.3	x
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.79	1	3.6		82.8	7.1	
PDXK	Pyridoxal kinase	7.02	1		62	27.0	5.5	
PKM	pyruvate kinase isozymes M1/M2 isoform 1	19.59	10	45.8	445	57.9	7.3	x
N/A	pyruvate kinase isozymes M1/M2 isoform 2	9.85	3	19.3	96	49.8	6.6	x
GDI2	rab GDP dissociation inhibitor beta	4.72	2	5.7	42	50.5	6.3	x
RDX	radixin	7.03	2	18.1	112	68.5	6.3	
RANBP1	ran-specific GTPase-activating protein	9.09	2	5.3	67	25.2	5.2	x
IQGAP1	ras GTPase-activating protein IQGAP1	1.39	2	6.5	58	188.8	6.5	
YPT1	Ras GTP-binding protein YPT1	22.92	2	5.2	70	10.9	5.1	x
RSU1	ras suppressor protein 1	3.25	1	2.2		31.5	8.6	
RAB11A	ras-related protein Rab-11A isoform 1	14.35	3	8.0		24.4	6.6	
RAB7A	ras-related protein Rab-7a	9.66	2	4.8		23.5	6.7	x
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	0.48	1	2.8	59	251.3	4.8	
ATP6AP2	renin receptor	1.87	1	2.3	45	48.0	5.1	
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	4.62	2	5.6	42	55.5	8.0	x
RARRES2	Retinoic acid receptor responder protein 2	8.33	2	7.8	68	16.4	9.1	x
SCPEP1	retinoid-inducible serine carboxypeptidase	5.05	2	5.8	72	51.2	5.5	x
ARHGDIA	rho GDP-dissociation inhibitor 1	20.10	3	10.0	167	23.4	5.2	x
RNASE4	ribonuclease 4	9.52	1	8.1	48	17.0	9.3	
RNH1	ribonuclease inhibitor	4.82	2	6.0	69	50.0	4.8	x
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7	x
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0	
RPS28	ribosomal protein S28	13.64	1	2.8	54	7.4	9.7	
RBM8A	RNA-binding protein 8A	11.11	1	5.4	50	19.5	5.7	

SEMA3B	semaphorin-3B	5.07	3	5.0	41	83.0	8.4	x
SEMA3C	semaphorin-3C	2.71	2	133.0	1253	83.6	8.6	x
SEMA3E	semaphorin-3E	1.29	1	2.6	43	89.5	7.8	
SEMA4B	Semaphorin-4B	1.14	1	2.5	44	87.8	7.2	
SEPT11	septin-11	4.47	2	5.9	53	49.0	7.0	x
SEPT9	septin-9	3.71	2	6.1	42	63.7	8.3	
HTRA1	serine protease HTRA1	5.66	2	2.9	77	34.4	7.1	x
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	8.48	2	3.2	80	37.5	6.3	x
SERPINB6	serpin B6 isoform 1	5.29	2	5.7	62	43.1	5.9	x
SERPINH1	Serpin H1	5.52	2	5.5	51	46.5	8.7	
ESD	S-formylglutathione hydrolase	12.06	2	8.5	79	31.3	6.9	x
SH2D3C	SH2 domain-containing protein 3C	1.10	1	4.7		90.7	8.5	
SH3BGRL2	SH3 domain-binding glutamic acid-rich protein	20.18	2	6.6	136	12.7	5.1	x
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	31.18	2		77	10.4	4.8	
SIAE	sialate O-acetylesterase	6.18	3	9.9	131	61.4	8.2	x
NEU1	Sialidase-1	6.46	2	6.4	78	39.0	5.5	x
SSB	Sjogren syndrome antigen B	3.55	1	3.7	78	36.0	9.3	
SLITRK4	SLIT and NTRK protein 4	1.21	1	4.9		92.7	7.9	
SNRPD1	small nuclear ribonucleoprotein Sm D1	16.81	1	2.4	82	13.3	11.6	
SNRPD3	small nuclear ribonucleoprotein Sm D3	11.90	1	2.5	58	9.3	11.9	
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9	
SUMO2	small ubiquitin-related modifier 2	12.63	1	7.3	81	10.8	6.9	
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	2.6	47	31.0	7.1	x
CANT1	soluble calcium-activated nucleotidase 1	5.75	2	7.3	99	45.2	6.6	x
SPARC	SPARC	6.19	2	49.4	181	34.8	4.8	x
SPTAN1	Spectrin alpha chain, brain	1.33	2	3.4	68	258.7	5.4	x
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9	x
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5	x
SMPD1	Sphingomyelin phosphodiesterase	5.40	3	8.4	104	66.2	7.0	x
DDX39B	Spliceosome RNA helicase BAT1	12.26	1		50	18.3	5.7	
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7	x
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.1	40	22.3	7.9	x
SFPQ	splicing factor, proline- and glutamine-rich	11.09	3	16.5	92	49.4	7.9	x
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2	
STIP1	Stress-induced-phosphoprotein 1	4.24	2	6.6	49	62.6	6.8	x
Psap	sulfated glycoprotein 1	6.52	3	90.4	1348	65.7	5.5	x

QSOX1	Sulfhydryl oxidase 1	6.57	3	22.5	195	70.3	7.9	x
SOD1	superoxide dismutase	4.96	1	3.4	78	25.9	9.6	
SBSN	suprabasin	4.61	2	6.9	104	63.3	7.4	x
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4	x
VAT1	Synaptic vesicle membrane protein VAT-1	11.58	2	34.2	496	28.5	7.6	x
SDC4	syndecan-4	4.95	1	7.1	43	22.2	4.6	
ACP5	tartrate-resistant acid phosphatase type 5	3.64	1	3.6	55	37.1	8.8	
TCP1	T-complex protein 1 subunit alpha	3.78	2	8.9	55	60.3	6.0	x
CCT2	T-complex protein 1 subunit beta	5.05	2	7.6	106	57.5	6.5	x
CCT4	T-complex protein 1 subunit delta	6.12	2	7.9	87	58.1	8.0	x
CCT5	T-complex protein 1 subunit epsilon isoform 1	3.33	2	6.2	107	59.5	5.5	x
CCT7	T-complex protein 1 subunit eta	4.81	2	6.4	83	54.9	7.4	x
CCT3	T-complex protein 1 subunit gamma	5.32	2	7.2	196	60.6	6.6	x
CCT8	T-complex protein 1 subunit theta	9.57	2	4.2	118	24.8	5.3	x
CCT6A	T-complex protein 1 subunit zeta	4.71	2	6.5	119	57.9	6.9	x
THOP1	thimet oligopeptidase	4.51	2	7.6	82	78.1	6.0	x
TXN	thioredoxin	28.92	2	6.5	60	9.1	4.7	x
TXNRD1	thioredoxin reductase 1	9.02	3	11.2	90	54.7	6.8	x
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	1.73	1	3.2	55	80.6	6.9	
THBS1	thrombospondin-1	1.88	2	46.3		129.6	4.9	x
THBS3	thrombospondin-3	2.72	2	7.7	62	104.1	4.6	x
FUCA1	tissue alpha-L-fucosidase	3.68	2	11.2	148	53.3	6.5	x
TFPI	tissue factor pathway inhibitor	3.34	2	5.3		34.4	8.2	x
PLAT	tissue-type plasminogen activator	4.29	2	5.4	73	63.0	8.2	x
TALDO1	transaldolase	6.53	2	5.8		37.5	7.0	x
BTF3	transcription factor BTF3	17.90	2	2.7	65	17.7	6.9	
TAGLN2	transgelin-2	18.59	3	17.9	203	22.4	8.6	x
VCP	Transitional endoplasmic reticulum ATPase	2.99	6	17.6	155	237.5	6.0	x
TKT	transketolase	14.45	6	10.8	214	67.7	7.6	x
TPT1	Translationally-controlled tumor protein	14.08	2	10.0	55	15.9	5.0	
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3	x
GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	5.7	44	107.5	6.8	x
TPI1	Triosephosphate isomerase	18.67	2	8.5	67	16.4	8.2	x
TPP1	tripeptidyl-peptidase 1	6.75	3	10.0	187	61.4	6.4	x
TPM3	tropomyosin alpha-3 chain isoform 2	17.41	2	7.4	110	28.8	4.8	x
TPM2	tropomyosin beta chain, partial	13.95	2	10.6	84	29.9	4.6	x

TUBA1C	tubulin alpha-1C chain	10.91	4	13.8	153	49.9	5.1	x
TUBB2A	Tubulin beta-2 chain	26.57	3	43.4	331	46.5	5.0	x
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1	x
TUBB3	Tubulin beta-3 chain	12.79	1	37.3	320	85.4	6.0	
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7	x
TTLL12	tubulin--tyrosine ligase protein 12	1.56	1	2.8	45	74.1	5.6	
TINAG	tubulointerstitial nephritis antigen	8.39	3	10.6	116	52.5	7.1	x
TNFSF9	tumor necrosis factor ligand superfamily member 9	4.89	1	7.8	83	33.6	6.2	
AXL	tyrosine-protein kinase receptor UFO	1.34	1	3.5	59	90.9	5.9	
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8	
UBA1	ubiquitin modifier-activating enzyme 1	2.36	2	6.4	94	117.6	5.7	x
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3	
UBE2N	ubiquitin-conjugating enzyme E2 N	9.81	2	4.0	98	23.6	7.3	x
UGDH	UDP-glucose 6-dehydrogenase, partial	8.52	2	7.2	87	29.4	7.6	x
D17Wsu104e	UPF0556 protein C19orf10 homolog	12.65	2	8.4	134	18.0	6.3	
RAD23B	UV excision repair protein RAD23 homolog B	4.43	2	5.9		51.7	5.9	
VPS35	vacuolar protein sorting-associated protein 35	3.11	2	5.8	41	96.0	5.5	
VASN	vasorin	1.49	1	2.7	56	72.5	7.5	
NSF	Vesicle-fusing ATPase	26.00	1	3.5	46	5.5	6.6	
NSF	vesicle-fusing ATPase, partial	14.29	1	2.6		8.6	5.4	
LMAN2	vesicular integral-membrane protein VIP36	2.25	1	2.9	53	40.2	6.9	
VIM	vimentin	8.95	3	253.6	2170	44.5	4.8	x
VCL	vinculin isoform 1	2.06	2	6.4	49	116.6	6.0	x
PROS1	vitamin K-dependent protein S	2.81	2	4.8	40	74.7	5.7	x
ATP6AP1	V-type proton ATPase subunit S1	7.71	2	5.7	78	48.9	6.0	x
WDR1	WD repeat-containing protein 1	4.66	2	8.8	87	58.8	7.1	x

Table 3.2.27: HCPs from non-producing CHO K1 cell culture supernatant identified with one or more peptides as being unique to the 37˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
RPS11	40S ribosomal protein S11	12.03	2	5.7	56	18.3	10.0
RPS13	40S ribosomal protein S13	5.30	1		49	15.2	10.3
RPL27A	60S ribosomal protein L27a	7.63	1	2.4		14.6	9.9
RPL35	60S ribosomal protein L35	8.20	1	2.8		14.4	10.7
RPL8	60S ribosomal protein L8	8.33	1	2.9	56	14.1	10.6
RPL9	60S ribosomal protein L9	5.21	1	2.5	55	21.9	9.9
ADAMTS4	A disintegrin and metalloproteinase with thrombospondin motifs 4	2.93	1		42	95.6	8.2
ACTB	actin, cytoplasmic 1	45.33	5	52.4	627	41.7	5.4
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	6.0	85	14.4	9.6
ADK	Adenosine kinase	3.32	1	3.5		40.2	6.6
AGRN	agrin isoform 1	5.40	7	24.7	226	217.0	5.8
ADH5	Alcohol dehydrogenase class-3	11.35	2	3.0	123	34.1	7.2
MAN2A1	Alpha-mannosidase 2	2.18	2	6.5	79	125.3	7.5
ABP1	amiloride-sensitive amine oxidase	1.57	1	2.8		79.8	6.6
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
B4GALT1	Beta-1,4-galactosyltransferase 1	3.49	1	2.4	64	30.1	8.9
B2M	beta-2-microglobulin precursor	36.13	5	25.6	187	13.8	7.4
CHST11	carbohydrate sulfotransferase 11	2.27	1	2.2		41.6	8.9
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
N/A	CCHC-type zinc finger	7.93	1	3.9		18.1	7.4
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
ALCAM	CD166 antigen	8.23	4	14.2	153	65.0	6.3
CD63	CD63 antigen	4.31	1	2.4		25.5	7.6
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	14.71	4	14.6	142	38.9	9.4
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
COL16A1	collagen alpha-1(XVI) chain	1.13	1	4.7	65	156.3	7.7
CTGF	Connective tissue growth factor	4.60	1	4.3		38.1	7.9

CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
SPRR1A	cornifin-A	28.32	1	2.2		12.4	7.9
CRIM1	Cysteine-rich motor neuron 1 protein	3.49	1	2.9		37.6	4.9
CRELD1	cysteine-rich with EGF domain protein 1	2.86	1	2.2		45.7	5.1
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
CTBS	Di-N-acetylchitobiase	5.15	1	2.5	57	32.9	5.7
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	1.07	1	2.3		90.6	6.1
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1.71	1	22.0	94	59.7	6.1
DYNLL1	dynein light chain 1, cytoplasmic	19.67	1		45	7.2	9.1
EFEMP1	EGF-containing fibulin extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
MAN1B1	Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase	3.86	1	3.0		29.7	6.5
env	Envelope glycoprotein	2.28	1	4.2	42	73.5	7.7
EIF3G	eukaryotic translation initiation factor 3 subunit G	4.06	1	3.3		35.7	5.9
EXT2	Exostosin 2	9.18	3	7.9	68	35.7	8.6
CSE1L	exportin-2	1.54	1	4.8	64	110.3	5.8
gag	Gag polyprotein	6.13	1	2.9		19.6	8.7
LGALS3	galectin-3	8.05	2	7.9	62	27.2	8.9
GGH	Gamma-glutamyl hydrolase	8.12	2	2.3	40	30.9	7.5
USO1	General vesicular transport factor p115	1.99	1	3.0	66	84.2	4.9
GRN	granulins isoform 2	10.47	5	14.7	133	63.9	6.4
PLA2G15	group XV phospholipase A2	2.75	1	2.3		33.7	6.5
RAN	GTP-binding nuclear protein Ran	24.54	5	13.5	88	24.5	8.3
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	17.70	2	3.9	77	23.1	4.7
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	10.27	1	4.0		19.9	4.9
H2AFZ	Histone H2A.Z	16.50	1	7.6		11.1	10.3
N/A	hypothetical protein I79_011206	3.13	1	3.9	45	69.3	6.3
N/A	hypothetical protein I79_018775	8.62	1		40	13.1	9.5
ITM2B	integral membrane protein 2B	4.89	1		46	30.3	5.1
KGFLP1	keratinocyte growth factor	4.64	1	2.3		22.4	9.1
LIFR	Leukemia inhibitory factor	6.33	1	3.0	40	17.4	8.9
LRP8	low-density lipoprotein receptor-related protein 8	1.67	1	3.9	48	112.3	5.0
LPCAT1	Lysophosphatidylcholine acyltransferase 1	3.65	1	2.2		21.7	10.3
PPT2	lysosomal thioesterase PPT2	5.96	1	4.4	47	34.3	6.5
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	7.37	4	7.9	106	71.5	6.7
MSLN	mesothelin	1.92	1	5.7	49	69.8	6.4
MAP6	microtubule-associated protein 6	7.56	1	5.6		50.2	9.2

GALNS	N-acetylgalactosamine-6-sulfatase	2.07	1	3.3	54	54.0	6.9
GALNT7	N-acetylgalactosaminyltransferase 7	2.14	1	4.0	70	69.7	7.5
NPPB	natriuretic peptides B	15.70	2	5.4	58	13.4	10.1
UBE2M	NEDD8-conjugating enzyme Ubc12	5.42	1	2.8		22.9	4.7
NBL1	neuroblastoma suppressor of tumorigenicity 1	3.93	1		43	19.1	5.0
SERPINI1	neuroserpin	7.80	3	12.5	113	46.6	4.9
ULBP1	NKG2D ligand 1	4.73	1	2.5		19.3	8.4
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
OSMR	oncostatin-M-specific receptor subunit beta	1.34	1		40	110.4	6.2
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
PDGFC	platelet-derived growth factor C	4.64	2	4.7		38.7	6.8
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	2.06	1	2.3		60.9	7.9
PSME3	Proteasome activator complex subunit 3	10.28	1	7.3	107	12.0	8.3
PSMB1	Proteasome subunit beta type-1	10.00	1	4.5	78	15.6	8.1
MEFV	Pyrin	1.46	1	2.3		76.3	7.1
Ptprs	Receptor-type tyrosine-protein phosphatase S	1.75	1	2.6		56.0	5.1
RPA3	replication protein A 14 kDa subunit	9.09	1	3.4	59	13.6	4.8
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
NANS	sialic acid synthase	2.79	1		56	40.2	6.9
SNRPD2	small nuclear ribonucleoprotein Sm D2	14.39	2	6.0	52	15.8	9.7
SORD	sorbitol dehydrogenase	6.44	2	2.4	47	38.3	7.7
SPTBN4	spectrin beta chain, brain 4	0.28	1	2.3		403.9	6.3
DDX39B	spliceosome RNA helicase Ddx39b	5.85	1	3.2		22.8	5.6
U2AF2	Splicing factor U2AF 65 kDa subunit	4.27	1	4.2	50	45.7	4.9
STC2	stanniocalcin-2	7.74	2	6.2		32.6	7.2
SULT1C2	sulfotransferase 1C2	4.01	1	2.2		35.3	8.3
O60687	Sushi repeat-containing protein SRPX2	4.24	1	3.2		32.2	7.8
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TGFBR2	TGF-beta receptor type-2 isoform 1	2.65	1	12.3		64.3	6.0
TOR1B	Torsin-1B	6.96	1	2.9		18.3	6.9
TPM2	Tropomyosin beta chain	16.98	3	10.2	108	30.7	4.8
TSKU	tsukushin	3.95	1	4.0		38.1	6.6
TUBA1A	Tubulin alpha-1A chain	19.29	6	21.6	250	50.1	5.1
TNFRSF21	tumor necrosis factor receptor superfamily member 21	3.36	2	5.4		71.5	7.5

YARS	Tyrosyl-tRNA synthetase, cytoplasmic	4.36	2	5.1		59.2	7.0
ZRSR1	U2 small nuclear ribonucleoprotein auxiliary factor 35 kDa subunit-related protein 1	2.34	1	2.3		51.0	9.1
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2	13.10	2	5.5	57	15.4	4.9
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.79	2	3.8	97	46.2	9.2
UXS1	UDP-glucuronic acid decarboxylase 1	13.65	4	13.1	50	43.3	7.7
N/A	uncharacterized protein C12orf29 homolog	4.31	1	2.3		37.3	7.3
N/A	Uncharacterized protein KIAA0319	2.11	1		62	104.3	6.1
PLAUR	Urokinase plasminogen activator surface receptor	5.38	1	2.3	43	20.3	5.1
VCAM1	vascular cell adhesion protein 1	2.61	1	2.9		42.5	4.8
VEGFA	Vascular endothelial growth factor A	3.29	1	2.7		24.6	8.1
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	4.2	82	26.8	7.8

Table 3.2.28: HCPs from non-producing CHO K1 cell culture supernatant identified with one or more peptides as being unique to the 31˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	3.7	50	10.9	9.2
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	2.26	2	6.3	78	109.4	5.0
YWHAG	14-3-3 protein gamma	6.59	1	5.2		19.2	4.7
PSMC6	26S protease regulatory subunit 10B	2.83	1	4.0	56	44.1	7.5
PSMC1	26S protease regulatory subunit 4	2.73	1	5.9	88	49.2	6.2
PSMC2	26S protease regulatory subunit 7	5.17	2	6.7	45	52.0	5.8
RPS10	40S ribosomal protein S10	4.97	1	2.9	63	20.4	10.1
RPS19	40S ribosomal protein S19	25.61	5	13.6	108	18.0	10.2
FAU	40S ribosomal protein S30	16.95	1	2.4		6.6	12.1
RPL11	60S ribosomal protein L11, partial	18.18	1	2.7	46	8.8	10.4
RPL17	60S ribosomal protein L17	5.05	1	2.6	46	23.0	10.2
RPL4	60S ribosomal protein L4	2.84	1	2.8	49	47.5	11.0
PFKL	6-phosphofructokinase, liver type	1.15	1	2.5		85.3	7.5
ACTG1	Actin, cytoplasmic 2	45.48	15	82.0	755	41.8	5.5
ADM	ADM	4.35	1	2.3		20.6	10.2
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	19.67	7	12.1	131	42.3	7.4
App	Alzheimer's amyloid beta protein precursor	17.72	1	12.4	529	8.5	7.4
AIMP1	Aminoacyl tRNA synthase complex-interacting multifunctional protein 1	5.61	1	4.6	54	35.2	8.8
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
APOA1	Apolipoprotein A-I-binding protein	5.22	1	2.8		25.4	5.4
RARS	Arginyl-tRNA synthetase, cytoplasmic	1.66	1	3.5	43	75.5	7.1
ATXN10	Ataxin-10	3.16	1	2.8	69	53.8	5.2
ABCF1	ATP-binding cassette sub-family F member 1	1.35	1		60	92.1	8.7
DDX39A	ATP-dependent RNA helicase DDX39	4.25	2	8.5	90	48.7	5.8
ACTR1B	beta-centractin	2.66	1	3.2		42.2	6.7
ATIC	Bifunctional purine biosynthesis protein PURH	4.39	2	5.1	40	64.6	6.9
CRTAP	Cartilage-associated protein	3.07	1	2.8		30.8	4.9
CSNK2A1	Casein kinase II subunit alpha	3.84	1	3.8		45.1	7.7
CD81	CD81 antigen isoform 1	8.47	1	4.1	74	25.8	5.5
CHD6	Chromodomain-helicase-DNA-binding protein 6	1.72	1	2.3		74.8	5.7

ARCN1	Coatomer subunit delta	2.15	1	2.8	41	57.2	6.2
CIRBP	Cold-inducible RNA-binding protein	6.51	1	3.7	58	18.3	9.7
COPS4	COP9 signalosome complex subunit 4	2.46	1	3.0	71	46.3	5.8
Q9UEE9	Craniofacial development protein 1	3.38	1	3.0	43	33.0	4.8
ATF4	Cyclic AMP-dependent transcription factor ATF-4	2.30	1	2.3		38.2	4.9
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
DNAJC8	DnaJ homolog subfamily C member 8	3.16	1	2.4		29.8	9.2
DBN1	Drebrin	2.83	1		55	69.5	4.4
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.71	1	2.8		65.3	6.3
EIF2S2	Eukaryotic translation initiation factor 2 subunit 2	3.00	1	2.4		38.2	5.8
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.76	2	7.4		174.8	5.4
EZR	Ezrin	13.25	5	27.1	236	68.8	6.3
SSRP1	FACT complex subunit SSRP1 isoform 1	1.55	1	2.5		81.0	6.9
CAPZA1	F-actin-capping protein subunit alpha-1	6.21	1	4.2	45	33.3	5.7
FNDC8	fibronectin type III domain-containing protein 8	3.11	1	4.6		35.9	6.3
BLVRB	Flavin reductase	14.56	3	8.3	53	22.1	8.4
TSTA3	GDP-L-fucose synthase	3.74	1	3.6	51	35.8	6.9
GSN	gelsolin	1.98	1	3.8		72.0	6.3
N/A	glutamate	1.11	1	2.4		137.1	8.6
N/A	Glutaminyl-tRNA synthetase	1.29	1	2.4	49	87.7	7.2
GPX1	Glutathione peroxidase 1	8.96	1		45	22.3	7.2
GSR	Glutathione reductase, mitochondrial	7.62	2	3.8	49	45.9	7.0
Gsta3	Glutathione S-transferase alpha-3	25.34	4	9.5	143	25.5	8.4
GSTM5	Glutathione S-transferase Mu 5	13.90	3	17.6	223	26.5	6.4
Gstm6	Glutathione S-transferase Mu 6	22.43	9	48.3	527	86.5	8.2
GSTO1	glutathione S-transferase omega-1 isoform 3	12.50	2	5.4		23.5	7.7
GAPDH	glyceraldehyde-3-phosphate dehydrogenase, partial	32.70	1	7.5	224	33.8	8.5
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GLIPR2	Golgi-associated plant pathogenesis-related protein 1	8.67	1	3.4	58	16.7	9.2
GNAL	Guanine nucleotide-binding protein G(olf) subunit alpha	6.75	1	3.1	60	18.6	7.9
HNRNPM	Heterogeneous nuclear ribonucleoprotein M	3.33	1		43	73.7	8.7
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
ITPR3	Inositol 1,4,5-trisphosphate receptor type 3	1.67	1	2.3		95.6	6.1
IMPA1	Inositol monophosphatase	4.66	1	6.5	68	25.6	6.8
ICAM1	intercellular adhesion molecule 1 precursor	2.66	1	3.5		57.6	7.2

IL1R1	Interleukin-1 receptor 1	5.44	2	7.1		37.6	9.0
KRT10	Keratin, type I cytoskeletal 10	16.05	3	13.5	194	27.8	4.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	10.43	1	17.2	234	45.9	8.1
KRT6A	Keratin, type II cytoskeletal 6A	9.19	1	17.1	181	48.5	8.0
KRT71	Keratin, type II cytoskeletal 71	6.07	5	15.6	155	133.3	6.6
MESDC2	LDLR chaperone MESD	4.42	1	2.5		25.1	6.3
N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
MVP	Major vault protein	4.28	1	3.8		40.9	6.0
CLNS1A	Methylosome subunit pICln	5.44	1	3.7	57	26.3	4.1
N/A	MGC84994 protein	10.53	1	2.6		9.0	6.0
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	3.98	1	3.3	42	38.3	5.9
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	4.53	1	2.3		27.1	5.1
OLA1	obg ATPase 1 isoform 1	2.27	1	2.9	41	44.7	7.8
OSTF1	Osteoclast-stimulating factor 1	3.74	1	4.5	40	23.6	5.7
PDLIM1	PDZ and LIM domain protein 1	7.31	1	3.4	63	24.0	7.0
FKBP2	peptidyl-prolyl cis-trans isomerase FKBP2 isoform 1	8.57	1	2.2		15.4	9.3
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
PFAS	phosphoribosylformylglycinamidine synthase	0.82	1	3.0	67	144.6	5.6
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PIR	Pirin	6.21	2	5.0		32.1	6.5
PABPN1	Polyadenylate-binding protein 2	5.21	1	2.9	43	23.8	9.8
PABPC4	Polyadenylate-binding protein 4	5.34	1	7.5	87	57.9	9.2
PTRF	polymerase I and transcript release factor	4.60	1	4.7	53	43.7	5.5
PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1		41	23.2	8.8
PFDN4	Prefoldin subunit 4	11.19	1	3.6	62	15.3	4.6
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
TSR2	Pre-rRNA-processing protein TSR2	13.45	1	2.9	43	13.2	4.4
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
PFN2	Profilin-2	10.14	1	4.1	57	14.9	7.0
PDCD6IP	Programmed cell death 6-interacting protein	2.97	2	6.5	79	89.1	6.1
PSMB8	Proteasome subunit beta type-8	4.00	1	3.2	78	30.4	6.9
CNPY2	Protein canopy 2	26.80	2	5.6	48	11.0	4.8
CDV3	protein CDV3 homolog	8.24	1	5.0	41	31.3	7.2

Ctla2b	protein CTLA-2-beta	25.00	3	9.4	83	11.8	5.1
DBF4	Protein DBF4 A	4.19	1	4.0		40.4	5.7
PPP1R7	Protein phosphatase 1 regulatory subunit 7	3.05	1	3.4	60	41.6	4.9
PPM1F	Protein phosphatase 1F	11.36	1	4.6	47	19.4	4.9
TANC2	Protein TANC2	0.41	1	2.2		217.5	7.6
FAT1	Protocadherin Fat 1	1.43	1	2.5	40	85.1	5.1
D1Pas1	putative ATP-dependent RNA helicase Pl10	6.49	2	9.1	103	58.1	7.1
RBM3	Putative RNA-binding protein 3	20.51	2		68	17.0	8.4
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.1	44	50.4	5.6
RAB5A	ras-related protein Rab-5A	5.12	1	2.6		23.5	8.1
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.6		20.8	5.8
RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
RRBP1	ribosome-binding protein 1	0.89	1	3.4		158.2	9.0
RBM39	RNA-binding protein 39 isoform a	2.83	1	2.5	45	59.3	10.1
EWSR1	RNA-binding protein EWS	7.37	1	3.4	60	20.0	8.0
FUS	RNA-binding protein FUS	8.33	2	4.7	40	48.5	9.1
RUVBL1	ruvB 1	2.63	1	3.3		50.2	6.4
SALL1	Sal protein 1	0.77	1	2.2		137.3	7.0
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9
SRSF5	serine/arginine-rich splicing factor 5	3.35	1	2.8	45	30.9	11.6
PPP2R1A	serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A beta isoform isoform 1	2.00	1	2.9		65.9	5.1
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
SGTA	Small glutamine-rich tetratricopeptide repeat-containing protein alpha	5.41	1		50	34.0	5.0
SNX1	sorting nexin-1 isoform 2	3.06	1	8.1	77	51.7	5.7
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
N/A	Sperm motility kinase X	5.08	1		41	22.1	6.7
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
SRSF7	Splicing factor, arginine/serine-rich 7	5.29	1	11.6	117	26.1	11.9
CTTN	src substrate cortactin isoform 1	3.87	1		48	49.0	5.1
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
TTC25	tetratricopeptide repeat protein 25	1.09	1	2.5	43	73.3	5.6
TANK	TRAF family member-associated NF-kappa-B activator	4.22	1		42	48.7	5.3
TRIM28	Transcription intermediary factor 1-beta	2.75	1	4.1	44	78.8	5.7
TRA2B	transformer-2 protein homolog beta isoform 1	5.56	1	2.9	75	33.6	11.3
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	50	14.4	4.8

N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBB2B	tubulin beta-2B chain	29.57	3	40.9	347	49.6	4.9
TUBB4B	tubulin beta-4B chain	22.79	8	37.3	327	41.8	4.9
TWF1	Twinfilin-1	2.57	1	2.9	42	40.0	6.5
SNRPA1	U2 small nuclear ribonucleoprotein A'	4.82	1	2.2		25.2	5.6
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	1.82	2	7.1	52	158.1	6.0
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	1.20	1	2.5		93.3	5.1
UCHL5	Ubiquitin carboxyl-terminal hydrolase isozyme L5	3.50	1	2.9		35.9	5.1
UFD1L	Ubiquitin fusion degradation protein 1 homolog	4.23	1	2.3		34.5	6.7
UBAP2	Ubiquitin-associated protein 2	4.36	1	3.9	55	49.3	8.7
UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	6.85	1	2.8	44	16.5	8.6
UBXN1	UBX domain-containing protein 1, partial	10.08	1	2.3		13.0	5.5
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
N/A	uncharacterized protein KIAA0586, partial	0.75	1	2.2		161.7	6.1
C22orf28	UPF0027 protein C22orf28	2.50	1	2.4		47.8	7.1
XPNPEP1	xaa-Pro aminopeptidase 1	1.77	1	2.7		69.8	5.5
ZEB2	zinc finger E-box-binding homeobox 2	0.91	1	2.5		135.4	6.1

Table 3.2.29: HCPs from non-producing CHO K1 cell culture supernatant identified with two or more peptides as being unique to the 37˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
RPS11	40S ribosomal protein S11	12.03	2	5.7	56	18.3	10.0
RPS12	40S ribosomal protein S12	15.70	2	5.5	54	13.5	7.9
RPS4X	40S ribosomal protein S4, X isoform	13.74	3	7.6	74	29.2	10.3
ACTB	actin, cytoplasmic 1	45.33	5	52.4	627	41.7	5.4
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	6.0	85	14.4	9.6
AGRN	agrin isoform 1	5.40	7	24.7	226	217.0	5.8
ADH5	Alcohol dehydrogenase class-3	11.35	2	3.0	123	34.1	7.2
GLA	Alpha-galactosidase A	16.13	4	16.4	134	38.5	5.0
MAN2A1	Alpha-mannosidase 2	2.18	2	6.5	79	125.3	7.5
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
B2M	beta-2-microglobulin precursor	36.13	5	25.6	187	13.8	7.4
HEXA	beta-hexosaminidase subunit alpha	3.98	2	7.5		60.6	6.5
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
ALCAM	CD166 antigen	8.23	4	14.2	153	65.0	6.3
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
CLN5	Ceroid-lipofuscinosis neuronal protein 5	7.33	2	5.6	46	32.0	6.1
CLIC4	Chloride intracellular channel protein 4	10.43	2	6.0		24.1	6.4
CLTC	clathrin heavy chain 1	5.25	7	16.3	199	191.6	5.8
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	14.71	4	14.6	142	38.9	9.4
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	9.05	2	4.7	47	25.3	6.4
CFH	complement factor H	6.22	3	9.2	40	72.7	6.7
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
CAND1	cullin-associated NEDD8-dissociated protein 1	4.64	4	13.2	57	133.5	5.7
CSRP1	cysteine and glycine-rich protein 1	12.95	2	9.8	112	20.5	8.6
CRIP2	cysteine-rich protein 2	11.06	2	4.9	44	22.7	8.6

COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
DPT	dermatopontin	13.93	2	2.7	68	24.0	4.9
DSTN	destrin	12.12	2	6.3	55	18.6	7.7
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	2.92	2	8.0		106.2	7.5
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	3.77	2	9.9	113	91.2	6.6
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	10.13	3	10.6	63	42.0	5.4
EFEMP1	EGF-containing fibulin-like extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
EEF1B2	elongation factor 1-beta	12.44	2	8.7	115	24.7	4.7
NPC2	epididymal secretory protein E1	26.85	3	5.4	43	16.5	8.0
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	5.08	2	9.5	79	51.1	8.4
EIF4B	eukaryotic translation initiation factor 4B	3.27	2	6.4	56	69.0	5.9
EIF6	eukaryotic translation initiation factor 6	13.06	2	3.0	90	26.6	4.7
EXT2	Exostosin 2	9.18	3	7.9	68	35.7	8.6
LGALS3	galectin-3	8.05	2	7.9	62	27.2	8.9
GGH	Gamma-glutamyl hydrolase	8.12	2	2.3	40	30.9	7.5
IFI30	gamma-interferon-inducible lysosomal thiol reductase	11.79	4	19.2	217	27.4	5.2
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
GOLM1	Golgi membrane protein 1	21.82	2	4.2	97	12.5	8.2
GRN	granulins isoform 2	10.47	5	14.7	133	63.9	6.4
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	17.70	2	3.9	77	23.1	4.7
RBBP7	histone-binding protein RBBP7	8.44	2	7.0		43.6	5.1
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8
IFNAR2	Interferon-alpha/beta receptor beta chain	10.67	2	7.4	112	28.7	5.6
ILF2	Interleukin enhancer-binding factor 2	23.42	2	8.9	61	17.0	8.2
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	6.7	72	55.4	6.7
MIF	macrophage migration inhibitory factor	17.39	2	2.8	136	12.4	7.3
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA-like, partial	7.37	4	7.9	106	71.5	6.7
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.95	3	9.4	86	47.5	7.5
NPPB	natriuretic peptides B	15.70	2	5.4	58	13.4	10.1
SERPINI1	neuroserpin	7.80	3	12.5	113	46.6	4.9
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
VNN1	pantetheinase	5.27	2	7.8	57	56.7	5.6
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3

POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2
PDGFC	platelet-derived growth factor C	4.64	2	4.7		38.7	6.8
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	3.95	3	9.5	76	75.9	6.2
PROSC	Proline synthetase co-transcribed bacterial protein	11.21	2	8.3	56	24.8	6.4
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4
PSMB5	proteasome subunit beta type-5	8.75	2	6.6	77	28.7	7.0
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8
SHISA5	protein shisa-5	12.81	3	15.5	62	25.9	6.5
PDXK	Pyridoxal kinase	12.81	2	3.1	111	27.0	5.5
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	0.87	2	5.7	47	251.3	4.8
ATP6AP2	renin receptor	7.96	4	11.8	108	48.0	5.1
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
RNASE4	ribonuclease 4	49.66	6	23.1	162	17.0	9.3
SEMA3E	semaphorin-3E	10.30	7	19.4	215	89.5	7.8
SEMA4B	semaphorin-4B	4.96	4	11.8	59	91.4	7.8
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6
SNRPD2	small nuclear ribonucleoprotein Sm D2	14.39	2	6.0	52	15.8	9.7
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	7.9	72	13.8	9.0
SORD	sorbitol dehydrogenase	6.44	2	2.4	47	38.3	7.7
STC2	stanniocalcin-2	7.74	2	6.2		32.6	7.2
SOD1	superoxide dismutase	14.88	2	6.4	105	25.9	9.6
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
SDC4	syndecan-4	12.38	2	5.6	87	22.2	4.6
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9
TPM2	Tropomyosin beta chain	16.98	3	10.2	108	30.7	4.8
TUBA1A	Tubulin alpha-1A chain	19.29	6	21.6	250	50.1	5.1
TTLL12	tubulin--tyrosine ligase protein 12	5.31	3	10.1	58	74.1	5.6
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	11.4	125	33.6	6.2
TNFRSF21	tumor necrosis factor receptor superfamily member 21	3.36	2	5.4		71.5	7.5
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	4.36	2	5.1		59.2	7.0
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2-like, partial	13.10	2	5.5	57	15.4	4.9

B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.79	2	3.8	97	46.2	9.2
UXS1	UDP-glucuronic acid decarboxylase 1	13.65	4	13.1	50	43.3	7.7
LMAN2	vesicular integral-membrane protein VIP36	5.62	2	6.1	53	40.2	6.9

Table 3.2.30: HCPs from non-producing CHO K1 cell culture supernatant identified with two or more peptides as being unique to the 31˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	2.26	2	6.3	78	109.4	5.0
PSMD4	26S proteasome non-ATPase regulatory subunit 4	5.84	2	10.7	131	40.7	4.8
RPL26	60S ribosomal protein L26	17.93	4	10.7	47	17.2	10.6
RPL30	60S ribosomal protein L30	27.83	3	8.5	59	12.8	9.6
AHSA1	Activator of 90 kDa heat shock protein ATPase homolog 1	8.88	3	7.4	45	38.1	5.5
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	19.67	7	12.1	131	42.3	7.4
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.24	2	4.7	41	53.6	6.3
DDX39A	ATP-dependent RNA helicase DDX39	4.25	2	8.5	90	48.7	5.8
ATIC	Bifunctional purine biosynthesis protein PURH	4.39	2	5.1	40	64.6	6.9
CAPRIN1	Caprin-1	3.41	2	6.4	68	72.5	5.1
CBX3	Chromobox protein homolog 3	15.08	2	7.8		20.4	5.3
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	110	102.1	5.6
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
MCM7	DNA replication licensing factor MCM7	3.06	2	6.5	75	81.0	6.3
NEDD4	E3 ubiquitin-protein ligase NEDD4	4.00	3	8.6	73	97.7	5.4
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
EIF3B	Eukaryotic translation initiation factor 3 subunit B	4.10	2	7.5	42	99.8	5.7
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.76	2	7.4		174.8	5.4
EZR	Ezrin	13.25	5	27.1	236	68.8	6.3
CAPZA2	F-actin-capping protein subunit alpha-2	8.74	2	6.1	99	33.0	5.8
FABP4	Fatty acid-binding protein, adipocyte	20.45	2	6.8	97	14.7	7.9
GPI	glucose-6-phosphate isomerase	6.45	3	9.1	71	63.0	7.6
PRKCSH	glucosidase 2 subunit beta isoform 2	12.57	6	14.6	110	59.1	4.5
GSR	Glutathione reductase, mitochondrial	7.62	2	3.8	49	45.9	7.0
Gsta3	Glutathione S-transferase alpha-3	25.34	4	9.5	143	25.5	8.4
GSTM5	Glutathione S-transferase Mu 5	13.90	3	17.6	223	26.5	6.4
Gstm6	Glutathione S-transferase Mu 6	22.43	9	48.3	527	86.5	8.2
Gstm7	Glutathione S-transferase Mu 7	36.70	2	23.8	396	25.8	6.4
GSTO1	glutathione S-transferase omega-1 isoform 3	12.50	2	5.4		23.5	7.7
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GLOD4	Glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
HSPB1	Heat shock protein beta-1	40.48	2	3.7	88	8.9	5.4

HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	14.69	3	2.3	83	34.1	9.2
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	6.27	2	3.2	54	45.2	7.6
HMGB2	High mobility group protein B2	20.13	3	9.0		18.2	5.4
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
N/A	hypothetical protein I79_015376	2.46	4	10.3	114	231.1	5.6
ILF3	interleukin enhancer-binding factor 3	4.24	3	9.2	65	95.8	8.7
IL1R1	Interleukin-1 receptor 1	5.44	2	7.1		37.6	9.0
IDH1	isocitrate dehydrogenase	14.01	5	16.6	84	46.7	7.0
KRT10	Keratin, type I cytoskeletal 10	16.05	3	13.5	194	27.8	4.5
KRT71	Keratin, type II cytoskeletal 71	6.07	5	15.6	155	133.3	6.6
GLO1	Lactoylglutathione lyase	9.24	2	5.1	45	20.9	5.3
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.7	63	34.9	5.9
LAMA2	Laminin subunit alpha-2	1.77	2	5.5		168.7	6.6
N/A	Lamin-L(I)	4.76	2	6.9	72	54.9	4.9
N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
NENF	Neudesin	17.95	2	2.7	45	12.9	4.9
GANAB	neutral alpha-glucosidase AB isoform 2	9.85	7	20.1	182	106.9	6.0
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
Q86UD1	Out at first protein	21.71	3	7.6		17.7	8.1
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	29.63	3	7.8	118	11.9	8.7
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3, partial	15.43	2	6.7		21.1	9.3
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	6.49	3	9.2		63.0	5.1
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PIR	Pirin	6.21	2	5.0		32.1	6.5
PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
PDCD6IP	Programmed cell death 6-interacting protein	2.97	2	6.5	79	89.1	6.1
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
CNPY2	Protein canopy 2	26.80	2	5.6	48	11.0	4.8
Ctla2b	protein CTLA-2-beta	25.00	3	9.4	83	11.8	5.1
PDIA4	Protein disulfide-isomerase A4	11.99	6	17.1	238	72.5	5.2
D1Pas1	putative ATP-dependent RNA helicase Pl10	6.49	2	9.1	103	58.1	7.1
RDX	Radixin	6.72	2	18.1	119	71.7	7.0
IQGAP1	ras GTPase-activating protein IQGAP1	1.93	3	9.2	116	188.8	6.5
RAB11A	ras-related protein Rab-11A isoform 1	14.35	3	8.0		24.4	6.6

RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
FUS	RNA-binding protein FUS	8.33	2	4.7	40	48.5	9.1
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9
SEPT9	Septin-9	3.66	2	6.1	42	64.4	8.3
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
SERPINH1	Serpin H1	5.52	2	6.2	43	46.5	8.4
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	31.18	2		77	10.4	4.8
SNRPB	Small nuclear ribonucleoprotein-associated protein B	12.99	2	2.6	50	23.6	10.9
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
BTF3	Transcription factor BTF3	17.79	2	2.7	67	17.8	8.3
TPT1	Translationally-controlled tumor protein	11.63	2	10.0	55	19.5	4.9
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBB2B	tubulin beta-2B chain	29.57	3	40.9	347	49.6	4.9
TUBB4B	tubulin beta-4B chain	22.79	8	37.3	327	41.8	4.9
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	1.82	2	7.1	52	158.1	6.0
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	14.56	2	7.3	72	18.1	5.1
Otub1	Ubiquitin thioesterase OTUB1	8.86	2	6.7	97	31.2	4.9
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
D17Wsu104e	UPF0556 protein C19orf10 homolog	18.82	3	7.9	58	18.4	6.8
RAD23B	UV excision repair protein RAD23 homolog B	6.94	3	10.8	49	43.7	4.9
VPS35	Vacuolar protein sorting-associated protein 35	3.27	2	5.8	41	91.6	5.4

Appendix C

Table 3.3.1: Top 10 differentially regulated proteins, based on peptide number, when all features of the protein profile from 24hrs in a DP12 culture was compared to 144hrs and normalised to an internal standard, Cytochrome C. These proteins were then identified in the same comparison but where all features were normalised to proteins that did not change in expression. This allowed for direct comparison to be made between Cytochrome C Normalisation (C) and the Normal means of Normalisation (N), based on peptide count, ion score, ANOVA, fold change and what condition the proteins is most highly expressed in.

DP12 24hrs vs 144hrs 37C All Features Normalised to Cytochrome C

Peptide		**Peptide Quant**		**Score**		**Anova**		**Fold**		**Up in**		**Protein**
C	**N**	**C**	**N**	**C**	**N**	**C**	**N**	**C**	**N**	**C**	**N**	
13	11	**13**	11	**763**	665	**0.001778**	0.00053	**16.3**	10.7	**24hrs**	24hrs	Complement C3
12	9	**11**	9	**895**	719	**0.010678**	0.027451	**2.9**	2.1	**24hrs**	24hrs	laminin subunit alpha-5 isoform 1
11	11	**9**	9	**617**	617	**7.29E-05**	1.14E-05	**8.3**	12.1	**144hrs**	144hrs	vimentin
10	10	**9**	9	**530**	530	**0.011827**	0.00311	**5.6**	3.5	**24hrs**	24hrs	Thrombospondin-1
10	1	**10**	1	**567**	59	**0.007707**	0.036892	**1.7**	2.7	**24hrs**	144hrs	Inter-alpha-trypsin inhibitor heavy chain H5
9	10	**9**	9	**479**	539	**0.000432**	0.000406	**5.6**	3.8	**24hrs**	24hrs	laminin subunit beta-1
9	9	**7**	7	**437**	437	**1.37E-05**	0.000382	**8.0**	11.1	**144hrs**	144hrs	endoplasmin
9	9	**9**	9	**540**	540	**0.000497**	0.000607	**4.3**	6.1	**144hrs**	144hrs	transketolase-like
9	9	**8**	8	**535**	535	**0.002051**	0.001882	**4.7**	6.7	**144hrs**	144hrs	Prostaglandin F2 receptor negative regulator
8	8	**6**	6	**405**	405	**0.000961**	1.08E-05	**6.1**	9.2	**144hrs**	144hrs	14-3-3 protein epsilon

N = All Feature Normalisation C = Cytochrome C normalisation

Table 3.3.2: Top 10 differentially regulated proteins, based on peptide number, when all features of the protein profile from 24hrs in a DP12 culture was compared to 144hrs and normalised to proteins that did not change in expression. These proteins were then identified in the same comparison but where all features were normalised to an internal standard, Cytochrome C. This allowed for direct comparison to be made between the Normal means of Normalisation (N) and Cytochrome C Normalisation (C), based on peptide count, ion score, ANOVA, fold change and what condition the proteins is most highly expressed in.

DP12 24hrs vs 144hrs 37C All Features Normalised to Features with no Fold Change

Peptide		**Peptide Quant**		**Score**		**Anova**		**Fold**		**Up in**		**Protein**
N	**C**	**N**	**C**	**N**	**C**	**N**	**C**	**N**	**C**	**N**	**C**	
11	11	**9**	9	**617**	617	**1.14E-05**	7.29E-05	**12.1**	8.3	**144hrs**	144hrs	vimentin
11	13	**11**	13	**665**	763	**0.00053**	0.001778	**10.7**	16.3	**24hrs**	24hrs	Complement C3
10	10	**9**	9	**530**	530	**0.00311**	0.011827	**3.5**	5.6	**24hrs**	24hrs	Thrombospondin-1
10	9	**9**	9	**539**	479	**0.000406**	0.000432	**3.8**	5.6	**24hrs**	24hrs	Laminin subunit beta-1
9	12	**9**	11	**719**	895	**0.027451**	0.010678	**2.1**	2.9	**24hrs**	24hrs	laminin subunit alpha-5 isoform 1
9	9	**7**	7	**437**	437	**0.000382**	1.37E-05	**11.1**	8.0	**144hrs**	144hrs	endoplasmin
9	9	**9**	9	**540**	540	**0.000607**	0.000497	**6.1**	4.3	**144hrs**	144hrs	transketolase-like
9	9	**8**	8	**535**	535	**0.001882**	0.002051	**6.7**	4.7	**144hrs**	144hrs	Prostaglandin F2 receptor negative regulator
8	6	**7**	5	**430**	310	**0.013282**	0.127074	**2.7**	1.4	**144hrs**	144hrs	peroxidasin homolog
8	7	**4**	4	**459**	416	**8.75E-06**	0.000185	**20.7**	13.9	**144hrs**	144hrs	14-3-3 protein eta

N = All Feature Normalisation C = Cytochrome C normalisation

Table 3.3.3: Number of differentially expressed proteins at 24hrs compared to 144hrs at 37˚C in an IgG secreting DP12 cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	24hrs vs 144hrs at 37˚C					
	Total		Up at 144hrs		Down at 144hrs	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	375	162	335	143	40	19
Apoptosis	8	2	8	2	0	0
	GNB2L1, CLU, HMOX1, SHISA5, GAPDH, GAPDH, APP, MAPK1	GNB2L1, CLU	GNB2L1, CLU, HMOX1, SHISA5, GAPDH, GAPDH, APP, MAPK1	GNB2L1, CLU		
Protease	25	9	17	6	8	3
	MMP9, HTRA1, PSMB6, BMP1, PSMA7, CTSB, C1ra, PSMA5, ADAM10, CTSL1, TPP1, ADAMTS1, PLAT, P15156, PSMA3, PSMB1, PSMB8, THOP1, CNDP2, PSMB2, PARK7, ADAM17, PSMB3, PSMA6, AGA	MMP9, HTRA1, PSMB6, BMP1, PSMA7, CTSB, C1ra, PSMA5, ADAM10	PSMB6, BMP1, PSMA7, CTSB, PSMA5, ADAM10, PSMA3, PSMB1, PSMB8, THOP1, CNDP2, PSMB2, PARK7, ADAM17, PSMB3, PSMA6, AGA	PSMB6, BMP1, PSMA7, CTSB, PSMA5, ADAM10	MMP9, HTRA1, C1ra, CTSL1, TPP1, ADAMTS1, PLAT, P15156	MMP9, HTRA1, C1ra
Glycosidase	12	4	9	2	3	2
	GLB1, GAA, HEX,B GBA, GUSB, HEXA, GLA, IDUA, GANAB, MAN2A1, NAGLU, MAN1A1	GLB1, GAA, HEXB, GBA	GAA, GBA, HEXA, GLA, IDUA, GANAB, MAN2A1, NAGLU, MAN1A1	GAA, GBA	GLB1, HEXB, GUSB	GLB1, HEXB

Table 3.3.4: List of host cell proteins, the expression of which increased after 144hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
LMNA	Lamin-A/C	9	9	663	0.0006	8.5
VIM	Vimentin	9	9	488	4.67E-05	10.5
VCP	Transitional endoplasmic reticulum ATPase	7	7	490	0.0001	5.8
HSPG2	basement membrane-specific heparan sulfate proteoglycan	7	7	393	0.0114	1.9
SBSN	Suprabasin	6	6	466	0.0022	2.5
TKT	Transketolase	6	6	336	0.0007	4.8
PKM	Pyruvate kinase isozymes M1/M2	6	6	335	0.0001	6.0
P4hb	Protein disulfide-isomerase	6	6	329	0.0003	6.0
PXDN	peroxidasin homolog	6	5	383	0.0007	3.8
ACTN1	Alpha-actinin-1	6	5	354	0.0001	8.7
TALDO1	Transaldolase	5	5	329	0.0003	21.7
PA2G4	Proliferation-associated protein 2G4	5	5	315	0.0008	9.1
PDIA3	Protein disulfide-isomerase A3	5	5	284	0.0011	12.4
EEF1G	Elongation factor 1-gamma	5	5	274	0.0020	11.4
TPI1	Triosephosphate isomerase	5	4	366	2.46E-05	25.7
YWHAH	14-3-3 protein eta	5	3	300	4.21E-06	18.7
YWHAB	14-3-3 protein beta/alpha	5	3	256	0.0003	30.5
TXNRD1	Thioredoxin reductase 1, cytoplasmic	4	4	281	0.0011	15.1
GSS	glutathione synthetase-like	4	4	277	0.0005	9.3
CCT7	T-complex protein 1 subunit eta	4	4	254	0.0010	8.3
UGDH	UDP-glucose 6-dehydrogenase	4	4	254	0.0001	5.6
TAGLN2	Transgelin-2	4	4	245	4.59E-05	14.2
CCT3	T-complex protein 1 subunit gamma	4	4	233	0.0013	5.2
Akr1b8	Aldose reductase-related protein 2	4	4	229	3.52E-05	15.3
NSFL1C	NSFL1 cofactor p47	4	4	227	2.74E-05	7.3
ALDOA	Fructose-bisphosphate aldolase A	4	4	218	0.0011	10.4
ACTG1	Actin, cytoplasmic 2	4	4	213	0.0001	7.5
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4	4	210	1.03E-05	12.7
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	4	4	200	0.0001	14.7
FTH1	Ferritin heavy chain	4	4	197	0.0001	4.4
MSN	Moesin	4	3	300	0.0003	18.4
YWHAE	14-3-3 protein epsilon	4	3	256	0.0053	8.8

RDX	Radixin	4	3	215	0.0007	15.1
PTGFRN	Prostaglandin F2 receptor negative regulator	3	3	222	0.0014	10.3
HSPA4	Heat shock 70 kDa protein 4	3	3	222	0.0002	9.1
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	3	3	208	2.63E-05	8.1
NCAM1	Neural cell adhesion molecule 1	3	3	199	0.0006	12.8
CAND1	Cullin-associated NEDD8-dissociated protein 1	3	3	189	0.0001	20.2
PSME1	Proteasome activator complex subunit 1	3	3	187	0.0021	3.2
CCT2	T-complex protein 1 subunit beta	3	3	186	0.0004	5.3
ILF2	Interleukin enhancer-binding factor 2	3	3	185	0.0001	11.5
PNP	Purine nucleoside phosphorylase	3	3	182	1.94E-05	4.9
VCL	Vinculin	3	3	182	0.0001	18.4
PGAM1	Phosphoglycerate mutase 1	3	3	179	0.0007	13.3
AHCY	Adenosylhomocysteinase	3	3	176	1.65E-05	27.3
GAA	Lysosomal alpha-glucosidase	3	3	173	0.0069	2.8
PSMB6	Proteasome subunit beta type-6	3	3	173	0.0084	10.2
RPS3	40S ribosomal protein S3	3	3	170	0.0006	8.7
NPM1	Nucleophosmin	3	3	164	0.0160	2.8
HSPA5	78 kDa glucose-regulated protein	3	3	161	0.0003	39.8
CBR1	Carbonyl reductase NADPH 1	3	3	160	0.0020	18.3
RPL23A	60S ribosomal protein L23a	3	3	156	0.0019	4.9
PDIA4	Protein disulfide-isomerase A4	3	3	155	0.0001	7.4
CCDC8	coiled-coil domain-containing protein 80-like	3	3	152	0.0424	2.0
BMP1	Bone morphogenetic protein 1	3	3	151	0.0278	2.7
PLTP	Phospholipid transfer protein	3	3	150	0.0026	2.5
EEF2	Elongation factor 2	3	3	149	0.0014	5.7
HSP90B1	Endoplasmin	3	3	148	3.17E-05	9.3
Cald1	Non-muscle caldesmon	3	3	147	0.0001	11.0
PSMA7	Proteasome subunit alpha type-7	3	3	147	0.0074	5.9
HYOU1	Hypoxia up-regulated protein 1	3	3	144	0.0017	4.5
CALU	Calumenin	3	3	138	1.03E-05	9.5
FN1	Fibronectin	3	3	130	0.0128	5.0
CTSB	Cathepsin B	3	2	214	0.0180	1.6
ACTN4	Alpha-actinin-4	3	2	206	1.27E-05	28.5
TPM4	Tropomyosin alpha-4 chain	3	2	167	0.0103	6.2
NAP1L4	Nucleosome assembly protein 1-like 4	3	2	158	0.0018	12.1
PLEC	plectin	3	2	146	0.0008	61.5

NME2	Nucleoside diphosphate kinase B	3	2	145	0.0055	13.1
YWHAG	14-3-3 protein gamma	3	1	138	0.0003	90.5
SH3BGRL	SH3 domain-binding glutamic acid-rich-like protein	2	2	166	0.0005	7.9
IPO5	Importin-5	2	2	165	0.0054	15.7
EEF1D	Elongation factor 1-delta	2	2	159	0.0005	24.4
PSME2	proteasome activator complex subunit 2-like isoform 1	2	2	156	0.0002	7.1
EIF3J	Eukaryotic translation initiation factor 3 subunit J	2	2	150	0.0004	24.8
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	2	2	149	0.0001	11.3
MAP4	microtubule-associated protein 4	2	2	146	0.0009	11.3
CAT	Catalase	2	2	141	0.0001	9.6
ANXA5	Annexin A5	2	2	141	1.52E-05	12.1
ADH5	Alcohol dehydrogenase class-3	2	2	139	0.0002	23.1
CCT5	T-complex protein 1 subunit epsilon	2	2	139	0.0123	25.9
CAPG	Macrophage-capping protein	2	2	138	0.0002	13.8
PLS3	Plastin-3	2	2	137	0.0001	119.4
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	2	2	132	0.0035	23.9
RPL5	60S ribosomal protein L5	2	2	130	0.0025	11.5
KPNB1	Importin subunit beta-1	2	2	130	0.0006	24.1
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	2	2	128	0.0130	2.6
MIF	Macrophage migration inhibitory factor	2	2	127	0.0157	124.0
CLIC1	Chloride intracellular channel protein 1	2	2	125	0.0002	5.3
LDHA	L-lactate dehydrogenase A chain	2	2	124	0.0001	20.3
SERPINB6	Serpin B6	2	2	124	0.0008	10.0
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	2	2	122	0.0010	4.2
PRKCSH	Glucosidase 2 subunit beta	2	2	117	0.0002	10.2
SERPINH1	Serpin H1	2	2	116	0.0003	9.5
HIST1H2AG	Histone H2A type 1	2	2	115	0.0019	4.6
PSMA5	Proteasome subunit alpha type-5	2	2	114	0.0041	4.6
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	2	2	114	0.0003	3.4
AARS	Alanyl-tRNA synthetase, cytoplasmic	2	2	113	0.0015	144.0
NEO1	Neogenin	2	2	113	0.0010	2.5
TCP1	T-complex protein 1 subunit alpha	2	2	112	0.0400	66.6
CORO1B	Coronin-1B	2	2	112	0.0001	24.4
SERPINF1	Pigment epithelium-derived factor	2	2	110	0.0021	3.9
DBI	Acyl-CoA-binding protein	2	2	109	0.0098	3.7
CCT8	T-complex protein 1 subunit theta	2	2	108	0.0018	23.0

NCL	Nucleolin	2	2	106	0.0004	7.5
LGALS3	Galectin-3	2	2	104	8.04E-06	23.1
RPL19	60S ribosomal protein L19	2	2	103	0.0058	47.3
LPL	Lipoprotein lipase	2	2	102	0.0089	12.3
CCT4	T-complex protein 1 subunit delta	2	2	100	0.0088	36.9
Rpl6	60S ribosomal protein L6	2	2	100	0.0001	17.1
CLSTN1	Calsyntenin-1	2	2	99	0.0024	273.9
RPS17	40S ribosomal protein S17	2	2	99	0.0005	21.2
G6PD	Glucose-6-phosphate 1-dehydrogenase	2	2	97	0.0018	18.2
GDI2	Rab GDP dissociation inhibitor beta	2	2	97	8.41E-06	7.4
TXNDC5	Thioredoxin domain-containing protein 5	2	2	96	0.0045	17.0
ADAM10	Disintegrin and metalloproteinase domain-containing protein 10	2	2	96	0.0065	2.9
CDC37	Hsp90 co-chaperone Cdc37	2	2	96	8.69E-06	34.7
RPS18	40S ribosomal protein S18	2	2	95	1.31E-05	15.1
RANBP1	Ran-specific GTPase-activating protein	2	2	95	0.0004	23.5
LASP1	LIM and SH3 domain protein 1	2	2	94	0.0003	53.2
PGK1	Phosphoglycerate kinase 1	2	2	94	0.0006	5.5
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	2	2	94	0.0014	16.5
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	2	2	94	0.0089	22.4
SERPINB1	Leukocyte elastase inhibitor A	2	2	93	0.0009	5.9
Psap	Sulfated glycoprotein 1	2	2	91	0.0094	27.1
GBA	glucosylceramidase	2	2	91	0.0196	2.2
ILF3	Interleukin enhancer-binding factor 3	2	2	91	0.0009	27.5
AKR1A1	Alcohol dehydrogenase (NADP+)	2	2	90	0.0003	10.2
GOT1	Aspartate aminotransferase, cytoplasmic	2	2	89	0.0006	9.9
CLU	Clusterin	2	2	89	0.0070	4.0
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	2	2	88	0.0071	13.4
GSTA4	Glutathione S-transferase A4	2	2	87	0.0001	63.9
IL1R1	Interleukin-1 receptor-like 1	2	2	87	0.0335	3.6
PRDX1	Peroxiredoxin-1	2	2	87	0.0006	9.9
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	2	2	87	0.0117	24.6
MDH1	Malate dehydrogenase, cytoplasmic	2	2	83	0.0013	10.0
TPM3	tropomyosin alpha-3 chain isoform 1	2	1	117	0.0017	8.6
YWHAZ	14-3-3 protein zeta/delta	2	1	115	0.0005	12.6
NUCB1	Nucleobindin-1	2	1	103	0.0007	3.1
NUCB2	Nucleobindin-2	2	1	102	0.0064	4.1

NAP1L1	Nucleosome assembly protein 1-like 1	2	1	101	4.19E-06	16.9
NME1	Nucleoside diphosphate kinase A	2	1	95	0.0001	4.7
PTGR1	Prostaglandin reductase 1	2	1	89	0.0005	77.7
MANF	Mesencephalic astrocyte-derived neurotrophic factor	1	1	94	0.0143	33.7
CAPZB	F-actin-capping protein subunit beta	1	1	94	3.50E-06	15.8
RPL23	60S ribosomal protein L23	1	1	89	0.0371	15.3
VAPA	Vesicle-associated membrane protein-associated protein A	1	1	89	0.0404	218.8
Arf2	ADP-ribosylation factor 2	1	1	89	0.0078	8.2
TXNDC12	Thioredoxin domain-containing protein 12	1	1	88	0.0132	5.9
LUC7L	Putative RNA-binding protein Luc7-like 2	1	1	85	0.0005	6.3
PGM1	Phosphoglucomutase-1	1	1	84	0.0012	99.5
EIF3H	Eukaryotic translation initiation factor 3 subunit H	1	1	81	0.0187	7.7
CLNS1A	Methylosome subunit pICln	1	1	80	0.0003	9.6
CRELD2	cysteine-rich with EGF-like domain protein 2 precursor	1	1	80	0.0023	57.9
CCT8	T-complex protein 1 subunit theta	1	1	80	0.0019	6.3
NANS	Sialic acid synthase	1	1	80	0.0001	23.6
PGM2	Phosphoglucomutase-2	1	1	80	0.0001	15.5
PDIA6	Protein disulfide-isomerase A6	1	1	79	0.0006	8.3
HSPE1	10 kDa heat shock protein, mitochondrial	1	1	78	0.0012	6.7
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	1	1	76	0.0005	4.5
FASN	Fatty acid synthase	1	1	76	0.0003	4.1
DDX17	Probable ATP-dependent RNA helicase DDX17	1	1	75	0.0007	5.5
HSPA13	Heat shock 70 kDa protein 13	1	1	75	0.0312	2.8
PSMA3	Proteasome subunit alpha type-3	1	1	75	0.0084	11.4
HMOX1	Heme oxygenase 1	1	1	74	0.0031	25.0
EFHD2	EF-hand domain-containing protein D2	1	1	74	8.81E-06	6.2
DSTN	Destrin	1	1	72	0.0012	9.0
ANXA1	Annexin A1	1	1	72	0.0012	5.4
WDR1	WD repeat-containing protein 1	1	1	71	0.0262	132.5
RAD23B	UV excision repair protein RAD23 homolog B	1	1	71	0.0025	4.3
SHISA5	protein shisa-5-like	1	1	70	0.0489	51.7
HPRT1	Hypoxanthine-guanine phosphoribosyltransferase	1	1	69	0.0005	13.5
CSPG4	Chondroitin sulfate proteoglycan 4	1	1	68	0.0071	48.7
SKP1	S-phase kinase-associated protein 1	1	1	67	0.0002	11.2
PDXK	Pyridoxal kinase	1	1	67	0.0083	20.9
EIF3B	Eukaryotic translation initiation factor 3 subunit B	1	1	67	0.0037	6.2

PRDX2	Peroxiredoxin-2	1	1	67	1.93E-05	8.1
UBA1	Ubiquitin-like modifier-activating enzyme 1	1	1	67	0.0006	6.2
HEXA	Beta-hexosaminidase subunit alpha	1	1	66	0.0365	1.6
RCN3	Reticulocalbin-3	1	1	66	0.0068	1.8
PSMB1	Proteasome subunit beta type-1	1	1	65	0.0178	6.8
RPS25	40S ribosomal protein S25	1	1	65	0.0012	Infinity
AKR1B1	Aldose reductase	1	1	65	0.0012	75.1
PSMB8	Proteasome subunit beta type-8	1	1	65	0.0249	33.9
RAB6A	Ras-related protein Rab-6A	1	1	64	0.0003	14.8
THOP1	Thimet oligopeptidase	1	1	64	0.0233	13.4
RPS14	40S ribosomal protein S14	1	1	63	0.0022	83.4
PSMD4	26S proteasome non-ATPase regulatory subunit 4	1	1	63	0.0013	6.8
ACP1	Low molecular weight phosphotyrosine protein phosphatase	1	1	63	0.0013	9.0
RPS24	40S ribosomal protein S24	1	1	63	0.0018	5.7
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	1	1	63	0.0237	145.8
RPL18	60S ribosomal protein L18	1	1	63	0.0192	1.6
G3BP1	Ras GTPase-activating protein-binding protein 1	1	1	62	0.0005	9.1
RPS15A	40S ribosomal protein S15a	1	1	62	0.0001	6.5
RPS10	40S ribosomal protein S10	1	1	62	0.0145	2.7
NHP2L1	NHP2-like protein 1	1	1	62	0.0008	15.3
GLA	Alpha-galactosidase A	1	1	62	0.0383	2.2
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	1	1	62	0.0003	16.5
RHOA	Transforming protein RhoA	1	1	62	0.0071	18.1
CCT6A	T-complex protein 1 subunit zeta	1	1	61	0.0128	10.4
GARS	Glycyl-tRNA synthetase	1	1	61	0.0073	12.3
MYL6	Myosin light polypeptide 6	1	1	61	0.0019	25.5
PPM1G	Protein phosphatase 1G	1	1	61	0.0003	23.5
PABPC1	Polyadenylate-binding protein 1	1	1	61	0.0003	6.0
AK2	Adenylate kinase 2, mitochondrial	1	1	60	0.0011	65.5
CNDP2	Cytosolic non-specific dipeptidase	1	1	60	0.0400	9.7
ALYREF	THO complex subunit 4	1	1	60	0.0014	10.1
USO1	General vesicular transport factor p115	1	1	60	0.0017	8.0
SNRPE	Small nuclear ribonucleoprotein E	1	1	60	0.0007	26.8
RPS4	40S ribosomal protein S4	1	1	59	0.0154	68.6
PTBP3	Regulator of differentiation 1	1	1	59	0.0019	9.3
NAA15	N-alpha-acetyltransferase 15, NatA auxiliary subunit	1	1	59	0.0013	29.4

CDC42	Cell division control protein 42 homolog	1	1	59	0.0057	160.9
SSB	Lupus La protein homolog	1	1	59	0.0003	7.5
CRKL	adapter molecule crk-like	1	1	58	0.0061	14.2
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	1	1	58	0.0017	25.0
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	1	1	58	0.0001	33.5
UBE2K	Ubiquitin-conjugating enzyme E2 K	1	1	58	0.0038	4.8
ACTR3	Actin-related protein 3	1	1	58	0.0015	1709.1
RNH1	Ribonuclease inhibitor	1	1	58	0.0437	61.5
RPS3A	40S ribosomal protein S3a	1	1	58	0.0008	11.9
ATP6AP2	Renin receptor	1	1	58	0.0036	3.9
GSR	Glutathione reductase, mitochondrial	1	1	58	0.0001	8.3
CRIP2	Cysteine-rich protein 2	1	1	58	0.0009	6.4
DCN	Decorin	1	1	57	0.0001	259.8
TXN	Thioredoxin	1	1	57	0.0034	5.6
HSPA8	Heat shock cognate 71 kDa protein	1	1	57	0.0032	3.1
VNN1	Pantetheinase	1	1	57	0.0011	2.4
VAT1	Synaptic vesicle membrane protein VAT-1 homolog	1	1	57	0.0265	118.0
TINAG	Tubulointerstitial nephritis antigen-like	1	1	57	0.0020	7.4
EIF4A1	Eukaryotic initiation factor 4A-I	1	1	57	0.0001	4.6
PCNA	Proliferating cell nuclear antigen	1	1	56	4.17E-05	4.6
ARPC1B	Actin-related protein 2/3 complex subunit 1B	1	1	56	0.0140	7.2
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	1	1	56	1.42E-05	8.9
EIF5A	Eukaryotic translation initiation factor 5A-1	1	1	56	0.0002	12.1
RPL29	60S ribosomal protein L29	1	1	56	0.0349	84.8
SDF4	45 kDa calcium-binding protein	1	1	56	0.0189	3.1
PPIB	Peptidyl-prolyl cis-trans isomerase B	1	1	56	0.0313	1.6
EIF4B	Eukaryotic translation initiation factor 4B	1	1	55	0.0005	9.1
SH3BGRL3	SH3 domain-binding glutamic acid-rich-like protein 3	1	1	55	0.0013	36.0
LMNB1	Lamin-B1	1	1	55	0.0039	16.5
CLIC4	Chloride intracellular channel protein 4	1	1	54	3.76E-05	11.6
CALM1	Calmodulin	1	1	54	0.0194	195.0
EIF3G	Eukaryotic translation initiation factor 3 subunit G	1	1	54	0.0016	9.5
ANXA2	Annexin A2	1	1	54	0.0002	8.0
TM6SF2	Transmembrane 6 superfamily member 2	1	1	53	0.0009	4.0
PSMB2	Proteasome subunit beta type-2	1	1	53	0.0020	20.5
PRPS1	Ribose-phosphate pyrophosphokinase 1	1	1	53	0.0068	3.7

TBCB	Tubulin-folding cofactor B	1	1	53	0.0014	41.1
PARK7	Protein DJ-1	1	1	52	0.0032	14.1
IDUA	Alpha-L-iduronidase	1	1	52	0.0086	16.9
GANAB	Neutral alpha-glucosidase AB	1	1	52	0.0096	6.1
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	52	0.0111	1.9
RPS9	40S ribosomal protein S9	1	1	52	0.0001	9.8
RPLP0	60S acidic ribosomal protein P0	1	1	52	0.0001	13.5
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	52	2.04E-05	13.7
HNRPDL	Heterogeneous nuclear ribonucleoprotein D-like	1	1	51	0.0028	7.8
SNRPD2	Small nuclear ribonucleoprotein Sm D2	1	1	51	0.0056	84.3
CLTC	Clathrin heavy chain 1	1	1	51	0.0029	11.4
PSMB3	Proteasome subunit beta type-3	1	1	51	0.0403	28.7
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	50	0.0205	5.6
RPSA	40S ribosomal protein SA	1	1	50	0.0033	48.2
CD44	CD44 antigen	1	1	50	0.0259	2.4
RPS16	40S ribosomal protein S16	1	1	50	1.29E-05	Infinity
DHFR	Dihydrofolate reductase	1	1	50	0.0004	23.3
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	1	1	49	0.0112	12.7
FAH	Fumarylacetoacetase	1	1	49	0.0115	29.9
APP	Amyloid beta A4 protein	1	1	49	0.0107	3.6
AHNAK	Neuroblast differentiation-associated protein AHNAK	1	1	49	1.28E-05	11.6
STIP1	Stress-induced-phosphoprotein 1	1	1	49	0.0020	12.0
VPS35	Vacuolar protein sorting-associated protein 35	1	1	49	0.0002	13.2
CFL1	Cofilin-1	1	1	49	0.0464	143.4
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	1	1	48	0.0024	11.4
GPI	Glucose-6-phosphate isomerase	1	1	48	0.0132	11.7
RPS2	40S ribosomal protein S2	1	1	48	0.0105	38.1
ASAH1	Acid ceramidase	1	1	48	0.0041	7.4
RPS20	40S ribosomal protein S20	1	1	48	0.0003	37.8
PSAT1	Phosphoserine aminotransferase	1	1	48	0.0417	58.7
PEBP1	Phosphatidylethanolamine-binding protein 1	1	1	47	0.0008	22.0
BLVRB	Flavin reductase	1	1	47	0.0028	31.2
PPA1	Inorganic pyrophosphatase	1	1	47	0.0082	2.8
RPS5	40S ribosomal protein S5	1	1	47	0.0262	77.5
TFPI	tissue factor pathway inhibitor-like	1	1	47	0.0003	4.1
RAB7A	ras-related protein Rab-7a-like	1	1	47	0.0239	121.7

NAMPT	Nicotinamide phosphoribosyltransferase	1	1	46	0.0001	22.5
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	1	1	46	3.12E-05	13.9
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	1	1	46	0.0001	15.6
CAP1	Adenylyl cyclase-associated protein 1	1	1	45	0.0005	62.0
PSMA6	Proteasome subunit alpha type-6	1	1	45	0.0072	7.3
RPA1	Replication protein A 70 kDa DNA-binding subunit	1	1	45	0.0266	27.2
IQGAP1	Ras GTPase-activating-like protein IQGAP1	1	1	45	0.0022	19.9
SF3A1	Splicing factor 3A subunit 1	1	1	45	0.0478	13.4
PLBD2	Putative phospholipase B-like 2	1	1	45	0.0062	2.6
GSPT1	Eukaryotic peptide chain release factor GTP-binding subunit ERF3A	1	1	45	0.0007	17.1
SLC3A2	4F2 cell-surface antigen heavy chain	1	1	45	3.72E-05	3.7
MAN2A1	Alpha-mannosidase 2	1	1	45	0.0015	2.9
EML2	Echinoderm microtubule-associated protein-like 2	1	1	44	0.0442	51.9
FDPS	Farnesyl pyrophosphate synthase	1	1	44	0.0009	4.1
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	1	1	44	0.0017	4.6
H1F0	Histone H1.0	1	1	44	0.0076	116.1
NUDC	Nuclear migration protein nudC	1	1	44	0.0013	9.1
S100A13	Protein S100-A13	1	1	44	0.0002	13.0
H3F3A	Histone H3.3	1	1	44	0.0033	32.0
LSM3	U6 snRNA-associated Sm-like protein LSm3	1	1	43	4.33E-07	168032.0
EEF1A1	Elongation factor 1-alpha 1	1	1	43	0.0068	3.4
GLO1	Lactoylglutathione lyase	1	1	43	0.0005	11.9
VEGFA	Vascular endothelial growth factor A	1	1	43	0.0096	3.7
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	1	1	43	0.0495	26.5
GSTP1	Glutathione S-transferase P	1	1	43	0.0001	44.1
RPS19	40S ribosomal protein S19	1	1	43	0.0457	2.7
RANBP2	E3 SUMO-protein ligase RanBP2	1	1	43	0.0138	280.2
GSTM1	Glutathione S-transferase Mu 1	1	1	43	0.0044	83.9
ADSL	Adenylosuccinate lyase	1	1	43	0.0003	24.0
SUB1	Activated RNA polymerase II transcriptional coactivator p15	1	1	43	0.0004	4.4
SRSF1	Serine/arginine-rich splicing factor 1	1	1	42	0.0006	42.9
RBMX	Heterogeneous nuclear ribonucleoprotein G	1	1	42	0.0009	5.6
PIR	Pirin	1	1	42	6.98E-09	Infinity
NAGLU	alpha-N-acetylglucosaminidase-like	1	1	42	0.0003	4.7
TUBA1B	Tubulin alpha-1B chain	1	1	42	0.0069	1.6
CRIP1	cysteine-rich protein 1-like	1	1	42	4.69E-05	9.1

RAN	GTP-binding nuclear protein Ran	1	1	42	0.0077	21.8
PPIA	Peptidyl-prolyl cis-trans isomerase A	1	1	41	0.0007	9.0
C14orf166	UPF0568 protein C14orf166 homolog	1	1	41	0.0021	20.9
ACLY	ATP-citrate synthase	1	1	41	0.0231	2.3
PFN1	Profilin-1	1	1	41	0.0043	57.1
CSTB	Cystatin-B	1	1	41	0.0036	9.4
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase	1	1	41	0.0339	4.4
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA-like,	1	1	41	0.0163	3.4
PCNP	PEST proteolytic signal-containing nuclear protein	1	1	41	0.0009	18.4
MAPK1	Mitogen-activated protein kinase 1	1	1	41	0.0141	96.2
RPS12	40S ribosomal protein S12	1	1	40	0.0144	37.6
RPS11	40S ribosomal protein S11	1	1	40	0.0030	96.7
CALR	Calreticulin	1	1	40	0.0008	8.1
PRMT1	Protein arginine N-methyltransferase 1	1	1	40	0.0033	7.6
ARPC2	Actin-related protein 2/3 complex subunit 2	1	1	40	0.0067	7.5

Table 3.3.5: List of host cell proteins, the expression of which decreased after 144hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
C3	Complement C3	11	11	557	0.0001	12.7
LAMA5	laminin subunit alpha-5 isoform 1	9	9	536	0.0006	2.8
PAM	Peptidyl-glycine alpha-amidating monooxygenase	4	4	277	0.0002	3.9
MMP9	matrix metalloproteinase-9	4	4	269	0.0002	7.6
THBS1	thrombospondin-1	5	5	266	0.0006	9.5
GLB1	Beta-galactosidase	3	3	219	0.0067	2.6
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	3	3	197	0.0255	1.9
PLA2G7	Platelet-activating factor acetylhydrolase	3	3	194	0.0095	3.5
OLFML1	Olfactomedin-like protein 3	3	3	188	0.0011	4.1
GPC1	Glypican-1	3	3	159	0.0190	2.0
SEMA3C	Semaphorin-3C	3	3	151	0.0024	2.6
HTRA1	Serine protease HTRA1	3	3	149	0.0135	12.1
AGRN	agrin-like isoform 1	2	2	128	0.0169	7.8
C1ra	Complement C1r-A subcomponent	2	2	119	0.0001	8.3
EPDR1	Mammalian ependymin-related protein 1	2	2	118	0.0004	3.4
LAMC1	Laminin subunit gamma-1	2	2	110	0.0087	4.6
IGHG1	Ig gamma-1 chain C region	2	2	106	0.0013	6.6
HEXB	Beta-hexosaminidase subunit beta	2	2	102	0.0063	2.6
ABP1	amiloride-sensitive amine oxidase	2	2	83	0.0193	5.0
CTSL1	Cathepsin L1	1	1	81	0.0122	2.6
TPP1	Tripeptidyl-peptidase 1	1	1	80	0.0141	1.9
SGSH	N-sulphoglucosamine sulphohydrolase	1	1	74	0.0006	1.5
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	65	0.0007	4.3
COL6A1	Collagen alpha-1(VI) chain	1	1	65	0.0197	2.6
GNS	N-acetylglucosamine-6-sulfatase	1	1	63	0.0042	2.2
COL5A2	Collagen alpha-2(V) chain	1	1	60	0.0354	1.9
UXS1	UDP-glucuronic acid decarboxylase 1	1	1	60	0.0034	3.0
PROS1	Vitamin K-dependent protein S	1	1	58	0.0393	3.1
MAMDC2	MAM domain-containing protein 2	1	1	57	0.0090	2.7
VEGFC	Vascular endothelial growth factor C	1	1	54	0.0097	3.1

MFGE8	Lactadherin	1	1	53	0.0004	1.9
PLAT	Tissue-type plasminogen activator	1	1	51	0.0005	2.5
TNFAIP6	tumor necrosis factor-inducible gene 6 protein-like	1	1	48	0.0324	1.7
IFNAR2	Interferon-alpha/beta receptor beta chain	1	1	45	0.0076	2.0
CYR61	Protein CYR61	1	1	44	0.0144	5.9
GUSB	Beta-glucuronidase	1	1	44	0.0095	3.5
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	43	0.0121	4.6
IGFBP4	Insulin-like growth factor-binding protein 4	1	1	43	0.0452	21.1
NBL1	neuroblastoma suppressor of tumorigenicity 1-like	1	1	42	0.0205	1.8
P15156	Calcium-dependent serine proteinase	1	1	41	2.01E-05	5.6

Table 3.3.6: Number of differentially expressed proteins at 24hrs compared to 144hrs at 31˚C in an IgG secreting DP12 cell culture supernatant. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	24hrs vs 144hrs at 31˚C					
	Total		Up at 144hrs		**Down at 144hrs**	
	≥1 Peptide	**≥2 Peptides**	**≥1 Peptide**	**≥2 Peptides**	**≥1 Peptide**	**≥2 Peptides**
Protein Count	391	179	361	168	30	11
Apoptosis	7	4	7	4	0	0
	GNB2L1, HMOX1, Cyc,s APP, DNASE2, GAPDH, GAPDH	GNB2L1, HMOX1, Cycs, APP	GNB2L1, HMOX1, Cycs, APP, DNASE2, GAPDH, GAPDH	GNB2L1, HMOX1, Cycs, APP		
Protease	24	11	19	9	5	2
	C1ra, MMP9, PSMB1, PSMA6, PSMA3, PSMB6, DPP7, CTSB, CTSA, SCPEP1, P15156, PRCP, ADAM10, MMP19, PSMA1, PSMB2, AGA, PARK7, LAP3, PSMA7, CTSZ, PSMA5, CTSD, CNDP2	C1ra, MMP9, PSMB1, PSMA6, PSMA3, PSMB6, DPP7, CTSB, CTSA, SCPEP1, P15156	PSMB1, PSMA6, PSMA3, PSMB6, DPP7, CTSB, CTSA, SCPEP1, P15156, PSMA1, PSMB2, AGA, PARK7, LAP3, PSMA7, CTSZ, PSMA5, CTSD, CNDP2	PSMB1, PSMA6, PSMA3, PSMB6, DPP7, CTSB, CTSA, SCPEP1, P15156	C1ra, MMP9, PRCP, ADAM10, MMP19	C1ra, MMP9
Glycosidase	11	6	9	6	2	0
	IDUA, NAGLU, GAA, GLA, GBA, FUCA1, MAN2A1, GUSB, GANAB, NAGA, GLB1	IDUA, NAGLU, GAA, GLA, GBA, FUCA1	IDUA, NAGLU, GAA, GLA, GBA, FUCA1, GANAB, NAGA, GLB1	IDUA, NAGLU, GAA, GLA, GBA , CA1	MAN2A1, GUSB	

Table 3.3.7: List of host cell proteins, the expression of which increased after 144hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
MSN	Moesin	10	10	551	2.07E-05	5.3
VIM	Vimentin	9	9	471	2.16E-05	14.6
HSPA5	78 kDa glucose-regulated protein	8	8	546	4.01E-05	19.7
FN1	Fibronectin	8	8	456	0.0073	2.6
VCP	Transitional endoplasmic reticulum ATPase	8	8	441	0.0004	7.8
ASAH1	Acid ceramidase	7	7	406	0.0052	2.2
HSPA13	Heat shock 70 kDa protein 13	7	7	379	0.0003	2.1
NUCB2	Nucleobindin-2	7	6	416	0.0008	3.7
CCDC8	coiled-coil domain-containing protein 80-like	6	6	420	0.0096	2.9
UGDH	UDP-glucose 6-dehydrogenase	6	6	385	3.96E-06	8.1
LMNA	Lamin-A/C	6	6	370	1.71E-05	9.5
HSPA4	Heat shock 70 kDa protein 4	6	6	337	0.0001	3.7
N/A	Tubulin beta-7 chain	6	6	331	0.0007	2.4
TKT	Transketolase	6	6	318	0.0001	5.9
EEF1G	Elongation factor 1-gamma	6	6	271	1.62E-05	8.9
HSPA8	Heat shock cognate 71 kDa protein	6	5	392	0.0033	1.9
ACTN1	Alpha-actinin-1	6	5	309	0.0001	4.2
HSP90B1	Endoplasmin	6	4	314	2.05E-05	21.1
PKM	Pyruvate kinase isozymes M1/M2	5	5	353	0.0004	3.5
CBR1	Carbonyl reductase NADPH 1	5	5	261	0.0003	6.8
GSS	glutathione synthetase-like	5	5	259	0.0003	5.7
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	5	5	254	0.0022	1.6
EEF2	Elongation factor 2	5	5	251	0.0017	2.8
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	4	4	275	0.0002	7.4
TALDO1	Transaldolase	4	4	271	0.0004	9.3
CCT8	T-complex protein 1 subunit theta-like	4	4	270	0.0046	2.9
PDIA6	Protein disulfide-isomerase A6	4	4	261	0.0004	9.3
IDUA	Alpha-L-iduronidase	4	4	248	4.71E-05	3.1
DHX9	ATP-dependent RNA helicase A	4	4	242	3.10E-05	52.3
SBSN	Suprabasin	4	4	242	0.0443	1.8

PDIA3	Protein disulfide-isomerase A3	4	4	221	0.0001	16.3
DCN	Decorin	4	4	220	0.0073	1.8
PTGFRN	Prostaglandin F2 receptor negative regulator	4	4	218	0.0034	2.9
CLSTN1	Calsyntenin-1	4	4	215	0.0054	2.6
STIP1	Stress-induced-phosphoprotein 1	4	4	211	0.0037	2.7
TPM3	tropomyosin alpha-3 chain isoform 1	4	4	211	0.0006	8.6
LDHA	L-lactate dehydrogenase A chain	4	4	206	0.0001	25.6
LASP1	LIM and SH3 domain protein 1	4	4	194	0.0001	3.5
Cald1	Non-muscle caldesmon	4	4	178	0.0022	5.5
PLS3	Plastin-3	3	3	224	0.0008	6.3
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	3	3	216	0.0052	2.2
NAGLU	alpha-N-acetylglucosaminidase-like	3	3	212	1.27E-05	12.7
PDIA4	Protein disulfide-isomerase A4	3	3	209	4.27E-06	25.1
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	3	3	208	1.04E-05	3.6
CCT4	T-complex protein 1 subunit delta	3	3	205	0.0042	3.8
KPNB1	Importin subunit beta-1	3	3	204	0.0009	4.1
PHGDH	d-3-phosphoglycerate dehydrogenase-like	3	3	197	1.46E-06	17.5
PSMD4	26S proteasome non-ATPase regulatory subunit 4	3	3	196	1.64E-05	17.1
CAPG	Macrophage-capping protein	3	3	195	0.0003	4.7
PA2G4	Proliferation-associated protein 2G4	3	3	194	0.0003	8.7
UBA1	Ubiquitin-like modifier-activating enzyme 1	3	3	194	0.0055	8.6
CAPZB	F-actin-capping protein subunit beta	3	3	190	8.99E-06	7.3
GAA	Lysosomal alpha-glucosidase	3	3	190	0.0005	2.4
LAMC1	Laminin subunit gamma-1	3	3	175	0.0203	2.6
BLVRB	Flavin reductase	3	3	175	0.0006	7.1
GNS	N-acetylglucosamine-6-sulfatase	3	3	174	0.0016	3.6
ALDOA	Fructose-bisphosphate aldolase A	3	3	166	1.02E-05	10.3
SDF4	45 kDa calcium-binding protein	3	3	165	0.0342	1.8
TXNRD1	Thioredoxin reductase 1, cytoplasmic	3	3	161	0.0003	8.9
CALR	Calreticulin	3	3	160	0.0001	6.3
SERPINH1	Serpin H1	3	3	159	0.0003	7.1
ANXA5	Annexin A5	3	3	158	7.32E-06	7.9
TYMS	Thymidylate synthase	3	3	154	0.0200	5.5
PCBP1	Poly(rC)-binding protein 1	3	3	152	2.24E-07	8.2

SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	3	3	152	0.0003	9.6
VAT1	Synaptic vesicle membrane protein VAT-1-like	3	3	151	0.0006	25.4
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	3	3	151	0.0022	4.1
P4hb	Protein disulfide-isomerase	3	3	150	3.83E-05	10.1
Psap	Sulfated glycoprotein 1	3	3	147	0.0090	38.0
QSOX1	sulfhydryl oxidase 1	3	3	145	0.0060	8.2
GSTA4	Glutathione S-transferase A4	3	3	131	4.05E-05	18.9
Q00285	Glutathione S-transferase Y1	3	2	205	0.0002	11.0
GSTM5	Glutathione S-transferase Mu 5	3	2	200	0.0003	13.3
HIST1H2AG	Histone H2A type 1	3	2	187	0.0002	7.8
AKR1A1	Alcohol dehydrogenase (NADP+)	3	2	185	1.51E-05	19.4
NUCB1	Nucleobindin-1	3	2	182	0.0005	2.4
YWHAB	14-3-3 protein beta/alpha	3	2	160	0.0002	22.1
HSP90AB1	heat shock protein HSP 90-beta-like	3	2	155	0.0012	3.8
YWHAZ	14-3-3 protein zeta/delta	3	2	142	0.0023	67.4
YWHAE	14-3-3 protein epsilon	3	2	132	0.0005	12.1
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	3	1	201	0.0015	4.7
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	3	1	170	0.0003	40.9
PGAM1	Phosphoglycerate mutase 1	2	2	209	0.0005	5.5
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase-like	2	2	166	0.0011	3.2
SERPINB6	Serpin B6	2	2	160	0.0004	6.8
ADH5	Alcohol dehydrogenase class-3	2	2	155	3.48E-05	10.3
FABP4	Fatty acid-binding protein, adipocyte	2	2	155	0.0010	13.4
PSMB1	Proteasome subunit beta type-1	2	2	155	0.0001	9.2
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	2	2	147	0.0006	3.4
FAM3C	Protein FAM3C	2	2	146	0.0029	3.5
PSME1	Proteasome activator complex subunit 1	2	2	144	0.0001	3.4
PSMA6	Proteasome subunit alpha type-6	2	2	136	0.0003	4.2
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	2	2	134	0.0054	3.0
CAPZA1	F-actin-capping protein subunit alpha-1	2	2	134	0.0038	22.6
PFN1	Profilin-1	2	2	131	0.0052	3.1
IPO5	Importin-5	2	2	130	0.0001	5.0
HMOX1	Heme oxygenase 1	2	2	129	1.13E-05	5.5
RAB7A	ras-related protein Rab-7a-like	2	2	129	3.01E-06	13.7

DSTN	Destrin	2	2	128	0.0001	2.9
PSMA3	Proteasome subunit alpha type-3	2	2	127	0.0001	8.1
HYOU1	Hypoxia up-regulated protein 1	2	2	127	0.0009	5.0
VAPA	Vesicle-associated membrane protein-associated protein A	2	2	125	0.0008	69.4
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	2	2	125	0.0023	18.8
NPM1	Nucleophosmin	2	2	123	0.0302	2.8
PSMB6	Proteasome subunit beta type-6	2	2	123	0.0012	11.1
PRDX2	Peroxiredoxin-2	2	2	123	0.0003	5.4
MYBBP1A	Myb-binding protein 1A	2	2	122	0.0002	3.9
SFPQ	Splicing factor, proline- and glutamine-rich	2	2	122	0.0007	6.0
DPP7	Dipeptidyl peptidase 2	2	2	121	0.0001	3.3
ILF2	Interleukin enhancer-binding factor 2	2	2	121	3.80E-07	10.0
PNP	Purine nucleoside phosphorylase	2	2	119	0.0005	6.3
RAD23B	UV excision repair protein RAD23 homolog B	2	2	118	0.0024	4.0
SERPINF1	Pigment epithelium-derived factor	2	2	118	0.0055	1.7
PRMT1	Protein arginine N-methyltransferase 1	2	2	118	0.0029	3.7
CTSB	Cathepsin B	2	2	117	3.59E-05	4.3
CLIC1	Chloride intracellular channel protein 1	2	2	116	0.0002	3.2
SEC22B	Vesicle-trafficking protein SEC22b	2	2	115	0.0009	120.8
TPM4	Tropomyosin alpha-4 chain	2	2	115	0.0001	1540.5
RPS16	40S ribosomal protein S16	2	2	115	0.0004	3.7
HSPE1	10 kDa heat shock protein, mitochondrial	2	2	115	0.0002	7.4
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	2	2	114	2.50E-06	8.6
OLA1	Obg-like ATPase 1	2	2	112	1.31E-05	9.3
CALU	Calumenin	2	2	111	0.0151	17.8
PPM1G	Protein phosphatase 1G	2	2	109	0.0005	26.9
LPL	Lipoprotein lipase	2	2	109	0.0013	4.9
Cycs	Cytochrome c, somatic	2	2	109	0.0075	1.9
EIF3G	Eukaryotic translation initiation factor 3 subunit G	2	2	108	0.0030	13.0
APRT	Adenine phosphoribosyltransferase	2	2	108	1.89E-05	9.6
TXNDC5	Thioredoxin domain-containing protein 5	2	2	107	0.0002	19.7
VCL	Vinculin	2	2	107	0.0026	12.5
APP	Amyloid beta A4 protein	2	2	107	1.71E-05	3.4
WDR1	WD repeat-containing protein 1	2	2	107	9.34E-06	6.0

PPT1	Palmitoyl-protein thioesterase 1	2	2	107	0.0035	3.5
GLA	Alpha-galactosidase A	2	2	106	0.0075	2.9
GPI	Glucose-6-phosphate isomerase	2	2	106	0.0001	5.2
NPPA	Atrial natriuretic factor	2	2	105	4.59E-05	3.3
IQGAP1	Ras GTPase-activating-like protein IQGAP1	2	2	104	0.0038	4.1
GBA	Glucosylceramidase	2	2	103	0.0014	2.9
CTSA	Lysosomal protective protein	2	2	102	0.0175	3.1
RPS21	40S ribosomal protein S21	2	2	102	0.0003	16.2
PPA1	Inorganic pyrophosphatase	2	2	102	0.0005	4.0
FUCA1	Tissue alpha-L-fucosidase	2	2	102	1.66E-06	2.6
PGD	6-phosphogluconate dehydrogenase, decarboxylating	2	2	101	0.0001	9.6
RPS18	40S ribosomal protein S18	2	2	101	0.0002	6.7
GSR	Glutathione reductase, mitochondrial	2	2	101	0.0003	12.4
CAND1	Cullin-associated NEDD8-dissociated protein 1	2	2	101	0.0006	7.2
YWHAG	14-3-3 protein gamma	2	2	99	0.0002	23.2
RPS19	40S ribosomal protein S19	2	2	98	0.0052	2.0
RPL23A	60S ribosomal protein L23a	2	2	98	0.0009	3.5
ACTG1	Actin, cytoplasmic 2	2	2	96	0.0001	4.6
SCPEP1	Retinoid-inducible serine carboxypeptidase	2	2	96	0.0051	3.0
RPS3	40S ribosomal protein S3	2	2	95	0.0001	4.2
RPLP0	60S acidic ribosomal protein P0	2	2	92	0.0171	2.9
NAP1L1	Nucleosome assembly protein 1-like 1	2	2	91	0.0018	3.9
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	2	2	91	0.0004	18.7
NCL	Nucleolin	2	2	91	0.0018	12.9
NUCB1	Nucleobindin-1	2	2	89	1.97E-06	1.9
PPCS	phosphopantothenate--cysteine ligase-like	2	2	88	0.0047	40.5
RAN	GTP-binding nuclear protein Ran	2	2	85	0.0094	4.3
P15156	Calcium-dependent serine proteinase	2	2	84	0.0001	2.6
GSTM1	Glutathione S-transferase Mu 1	2	1	123	3.89E-05	27.2
PLA2G7	platelet-activating factor acetylhydrolase-like	2	1	122	0.0019	4.5
HIST1H2AG	Histone H2A type 1	2	1	105	0.0003	226.5
ACTN4	Alpha-actinin-4	2	1	100	0.0041	23.0
AKR1B1	Aldose reductase	2	1	97	0.0067	18.8
THBS3	thrombospondin-3	2	1	96	0.0100	1.5

PTGR1	Prostaglandin reductase 1	2	1	96	0.0054	18.9
YWHAH	14-3-3 protein eta	2	1	88	0.0001	81.1
SERPINB1	Leukocyte elastase inhibitor A	1	1	105	0.0127	7.7
NRP1	Neuropilin-1	1	1	99	0.0027	1.7
COPS4	COP9 signalosome complex subunit 4	1	1	93	0.0008	32.0
ATXN10	Ataxin-10	1	1	87	0.0012	13.6
PSMA1	Proteasome subunit alpha type-1	1	1	86	0.0012	3.3
PCNA	Proliferating cell nuclear antigen	1	1	85	0.0001	22.7
BLVRA	Biliverdin reductase A	1	1	85	8.29E-06	8.8
TPI1	Triosephosphate isomerase	1	1	84	1.38E-05	5.5
TNFSF9	tumor necrosis factor ligand superfamily member 9-like	1	1	81	0.0093	20.7
EIF4A1	Eukaryotic initiation factor 4A-I	1	1	81	0.0112	23.6
MAP4	Microtubule-associated protein 4	1	1	79	0.0055	3.1
PFDN2	Prefoldin subunit 2	1	1	78	4.33E-05	6.7
CAPRIN1	Caprin-1	1	1	78	0.0008	8.6
RPL10A	60S ribosomal protein L10a	1	1	77	0.0256	589.5
EEF1B2	Elongation factor 1-beta	1	1	77	0.0023	3.0
PFN2	Profilin-2	1	1	76	0.0001	6.6
PSMD6	26S proteasome non-ATPase regulatory subunit 6	1	1	76	0.0047	6.9
GCLM	Glutamate--cysteine ligase regulatory subunit	1	1	75	0.0141	8.0
DDX17	Probable ATP-dependent RNA helicase DDX17	1	1	75	3.56E-06	4.9
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	1	1	73	0.0205	216.3
PIR	Pirin	1	1	73	0.0061	4.9
TAGLN2	Transgelin-2	1	1	73	0.0004	4.5
USO1	General vesicular transport factor p115	1	1	72	4.97E-05	6.8
YBX1	Nuclease-sensitive element-binding protein 1	1	1	72	0.0025	7.9
PGM2	Phosphoglucomutase-2	1	1	71	0.0019	9.7
OSTF1	Osteoclast-stimulating factor 1	1	1	71	0.0003	17.1
ATIC	Bifunctional purine biosynthesis protein PURH	1	1	71	0.0038	3.3
SIAE	sialate O-acetylesterase-like	1	1	71	0.0245	2.7
LXN	Latexin	1	1	71	0.0010	26.8
CLNS1A	Methylosome subunit pICln	1	1	71	0.0229	2.7
RPL11	60S ribosomal protein L11	1	1	70	0.0047	1.9
APEX1	DNA-(apurinic or apyrimidinic site) lyase	1	1	70	0.0002	8.7

CAT	Catalase	1	1	70	0.0007	9.8
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	1	1	69	0.0034	1.9
VNN1	Pantetheinase	1	1	68	0.0018	3.6
EIF1	Eukaryotic translation initiation factor 1	1	1	67	0.0005	3.5
CDC37	Hsp90 co-chaperone Cdc37	1	1	67	0.0006	12.7
RBM3	Putative RNA-binding protein 3	1	1	66	0.0185	165.6
LUC7L	Putative RNA-binding protein Luc7-like 2	1	1	66	0.0017	7.9
PPP2R2A	Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	1	1	66	0.0038	3.4
HDGF	Hepatoma-derived growth factor	1	1	66	0.0167	229.7
CCT3	T-complex protein 1 subunit gamma	1	1	66	0.0269	1.9
EIF4B	Eukaryotic translation initiation factor 4B	1	1	66	0.0005	11.0
RPS3A	40S ribosomal protein S3a	1	1	65	0.0004	14.5
N/A	Ig heavy chain V-III region WEA	1	1	65	0.0087	39.7
RPL9	60S ribosomal protein L9	1	1	65	0.0167	1.8
CSTB	Cystatin-B	1	1	64	0.0020	5.0
PSMB2	Proteasome subunit beta type-2	1	1	64	0.0001	50.2
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase	1	1	63	0.0003	57.2
SARNP	SAP domain-containing ribonucleoprotein	1	1	63	0.0090	294.6
DNASE2	Deoxyribonuclease-2-alpha	1	1	63	0.0006	3.7
PFDN1	Prefoldin subunit 1	1	1	62	0.0024	16.4
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	1	1	62	0.0074	74.4
RPS25	40S ribosomal protein S25	1	1	62	0.0312	106.2
PABPC1	Polyadenylate-binding protein 1	1	1	62	0.0009	3.4
RPL29	60S ribosomal protein L29	1	1	61	0.0218	165.0
CCT7	T-complex protein 1 subunit eta	1	1	61	0.0026	2.4
MYL6	Myosin light polypeptide 6	1	1	61	0.0013	22.3
LGALS3BP	Galectin-3-binding protein	1	1	61	0.0023	3.2
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	1	1	61	0.0046	14.1
C11orf68	UPF0696 protein C11orf68 homolog	1	1	60	0.0002	20.1
AK2	Adenylate kinase 2, mitochondrial	1	1	60	0.0001	115.1
RPLP1	60S acidic ribosomal protein P1	1	1	60	0.0006	2.1
TSN	Translin	1	1	60	5.73E-08	36.8
PTGES3	Prostaglandin E synthase 3	1	1	59	0.0032	226.5
CNPY2	Protein canopy homolog 2	1	1	59	0.0019	6.9

NUDC	Nuclear migration protein nudC	1	1	59	0.0003	6.8
RPL3	60S ribosomal protein L3	1	1	59	0.0088	136.2
U2AF2	Splicing factor U2AF 65 kDa subunit	1	1	59	0.0030	11.4
ALYREF	THO complex subunit 4	1	1	59	0.0031	4.4
CAP1	Adenylyl cyclase-associated protein 1	1	1	59	0.0169	102.4
ADSL	Adenylosuccinate lyase	1	1	58	0.0006	12.0
RPS8	40S ribosomal protein S8	1	1	58	3.72E-05	2.6
ARHGDIA	Rho GDP-dissociation inhibitor 1	1	1	58	0.0063	5.5
HNRPDL	Heterogeneous nuclear ribonucleoprotein D-like	1	1	58	0.0001	5.9
SH3BGRL3	SH3 domain-binding glutamic acid-rich-like protein 3	1	1	58	0.0004	32.3
RBM8A	RNA-binding protein 8A	1	1	58	0.0019	4.4
ATP6AP2	Renin receptor	1	1	57	0.0012	6.2
ATP6AP1	V-type proton ATPase subunit S1	1	1	57	0.0035	2.1
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	1	1	57	0.0208	179.2
PRMT5	Protein arginine N-methyltransferase 5	1	1	57	0.0114	12.3
CSE1L	Exportin-2	1	1	57	1.42E-08	Infinity
RPL26	60S ribosomal protein L26	1	1	56	0.0124	96.4
HMGCS1	Hydroxymethylglutaryl-CoA synthase, cytoplasmic	1	1	56	0.0041	3.2
CLIC4	Chloride intracellular channel protein 4	1	1	56	6.04E-06	12.4
GARS	Glycyl-tRNA synthetase	1	1	55	0.0065	3.6
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	1	1	55	0.0004	7.3
TXN	Thioredoxin	1	1	55	0.0062	2.9
RNH1	ribonuclease inhibitor-like	1	1	55	1.42E-05	5.4
PPP1CB	Serine/threonine-protein phosphatase PP1-beta catalytic subunit	1	1	55	4.62E-05	25.7
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	1	1	54	0.0001	18.8
RPL19	60S ribosomal protein L19	1	1	54	0.0268	61.8
PSME2	proteasome activator complex subunit 2-like isoform 1	1	1	53	0.0016	4.4
PTBP3	Regulator of differentiation 1	1	1	53	0.0007	6.9
CCT5	T-complex protein 1 subunit epsilon	1	1	53	0.0053	16.9
BTF3	Transcription factor BTF3	1	1	53	0.0003	25.5
IMPA1	Inositol monophosphatase 1	1	1	53	0.0004	10.9
SF3A1	Splicing factor 3A subunit 1	1	1	53	0.0067	21.5
S100A13	Protein S100-A13	1	1	53	0.0010	19.4
ANXA2	Annexin A2	1	1	53	0.0056	12.5

PARK7	Protein DJ-1	1	1	53	0.0006	7.9
DHFR	Dihydrofolate reductase	1	1	52	0.0088	29.4
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	1	1	52	0.0077	39.4
RPS20	40S ribosomal protein S20	1	1	52	0.0036	10.7
SRXN1	Sulfiredoxin-1	1	1	52	0.0009	44.1
PPIB	Peptidyl-prolyl cis-trans isomerase B	1	1	52	0.0017	4.5
FDPS	Farnesyl pyrophosphate synthase	1	1	51	0.0025	6.1
SET	Protein SET	1	1	51	0.0002	84.9
CNN2	Calponin-2	1	1	51	0.0012	50.5
CIRBP	Cold-inducible RNA-binding protein	1	1	51	0.0004	30.4
EEF1A1	Elongation factor 1-alpha 1	1	1	51	0.0120	2.1
PGK1	Phosphoglycerate kinase 1	1	1	51	0.0013	23.9
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	1	1	51	0.0001	14.5
PCBP2	Poly(rC)-binding protein 2	1	1	51	0.0008	11.1
CMPK1	UMP-CMP kinase	1	1	50	0.0197	14.4
RPS14	40S ribosomal protein S14	1	1	50	0.0144	180.6
CCT2	T-complex protein 1 subunit beta	1	1	50	0.0001	4.3
NPLOC4	Nuclear protein localization protein 4 homolog	1	1	50	0.0003	11.0
GALM	Aldose 1-epimerase	1	1	50	0.0016	10.6
RBMX	Heterogeneous nuclear ribonucleoprotein G	1	1	50	0.0010	4.6
Ctla2b	protein CTLA-2-beta-like	1	1	50	0.0001	6.3
DYNLL2	Dynein light chain 2, cytoplasmic	1	1	50	0.0051	4.5
EIF2S3	Eukaryotic translation initiation factor 2 subunit 3	1	1	49	0.0001	8.4
GANAB	Neutral alpha-glucosidase AB	1	1	49	6.57E-06	7.0
RAB1A	Ras-related protein Rab-1A	1	1	49	0.0262	117.9
G3BP2	Ras GTPase-activating protein-binding protein 2	1	1	49	0.0015	6.5
RPS9	40S ribosomal protein S9	1	1	49	0.0002	4.5
EIF3I	Eukaryotic translation initiation factor 3 subunit I	1	1	49	0.0201	136.9
LAP3	Cytosol aminopeptidase	1	1	48	0.0447	4.9
CSRP1	Cysteine and glycine-rich protein 1	1	1	48	0.0034	49.6
SULF2	extracellular sulfatase Sulf-2	1	1	48	4.02E-05	7.3
GRN	granulins isoform 1	1	1	48	0.0067	11.6
TFPI	tissue factor pathway inhibitor-like	1	1	48	0.0019	17.2
PDXK	Pyridoxal kinase	1	1	48	0.0041	12.5

CD44	CD44 antigen	1	1	48	0.0037	2.1
RPS6	40S ribosomal protein S6	1	1	47	0.0041	12.0
RPS7	40S ribosomal protein S7	1	1	47	0.0017	2.8
NAGA	Alpha-N-acetylgalactosaminidase	1	1	47	0.0113	1.7
FAH	Fumarylacetoacetase	1	1	47	0.0086	385.6
ANXA1	Annexin A1	1	1	47	0.0002	6.4
D17Wsu104e	UPF0556 protein C19orf10 homolog	1	1	47	0.0330	471.3
PSMA7	Proteasome subunit alpha type-7	1	1	47	0.0002	13.6
TXNL1	Thioredoxin-like protein 1	1	1	47	0.0005	Infinity
RPL13	60S ribosomal protein L13	1	1	47	0.0065	3.7
UBE2K	Ubiquitin-conjugating enzyme E2 K	1	1	47	0.0271	3.5
ACP1	Low molecular weight phosphotyrosine protein phosphatase	1	1	47	0.0028	9.6
Akr1b8	Aldose reductase-related protein 2	1	1	46	0.0134	320.7
RPSA	40S ribosomal protein SA	1	1	46	0.0087	10.1
CCT6A	T-complex protein 1 subunit zeta	1	1	46	0.0095	4.0
LPHN2	Latrophilin-2	1	1	46	0.0256	10.5
SUB1	Activated RNA polymerase II transcriptional coactivator p15	1	1	46	0.0008	6.4
VPS35	Vacuolar protein sorting-associated protein 35	1	1	46	0.0018	9.4
CD63	CD63 antigen	1	1	46	0.0186	25.3
SPARC	SPARC	1	1	46	0.0054	34.8
RANBP1	Ran-specific GTPase-activating protein	1	1	46	0.0437	90.6
RPL12	60S ribosomal protein L12	1	1	46	3.09E-05	7.0
FTH1	Ferritin heavy chain	1	1	46	0.0009	79.1
CTSZ	Cathepsin Z	1	1	45	0.0004	10.8
AHNAK	Neuroblast differentiation-associated protein AHNAK	1	1	45	0.0004	11.5
GDI2	Rab GDP dissociation inhibitor beta	1	1	45	0.0024	37.8
SUMO2	Small ubiquitin-related modifier 2	1	1	45	3.62E-06	66.0
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	1	1	45	0.0001	31.0
PEBP1	Phosphatidylethanolamine-binding protein 1	1	1	45	0.0002	27.0
RPS26	40S ribosomal protein S26	1	1	44	0.0108	3.2
RPL28	60S ribosomal protein L28	1	1	44	3.56E-05	8.0
UBE2N	Ubiquitin-conjugating enzyme E2 N	1	1	44	0.0092	3.2
RPS15A	40S ribosomal protein S15a	1	1	44	0.0002	3.7
GLB1	Beta-galactosidase	1	1	44	0.0003	Infinity

TCEB2	Transcription elongation factor B polypeptide 2	1	1	44	0.0029	38.2
PLBD2	Putative phospholipase B-like 2	1	1	43	0.0011	5.4
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	1	1	43	0.0158	9.3
SEPT11	Septin-11	1	1	43	0.0002	10.4
IPO4	Importin-4	1	1	43	0.0003	Infinity
RAB6A	Ras-related protein Rab-6A	1	1	43	0.0061	7.4
PSMA5	Proteasome subunit alpha type-5	1	1	43	2.07E-05	39.2
CTSD	Cathepsin D	1	1	43	0.0006	35.3
NSFL1C	NSFL1 cofactor p47	1	1	43	4.70E-05	52.5
RAB11A	Ras-related protein Rab-11A	1	1	42	0.0154	13.9
SNRPE	Small nuclear ribonucleoprotein E	1	1	42	0.0130	19.2
NEDD4	E3 ubiquitin-protein ligase NEDD4	1	1	42	0.0069	3.1
LGALS3	Galectin-3	1	1	42	0.0015	3.5
ACTN4	Alpha-actinin-4	1	1	42	0.0012	55.7
GSTP1	Glutathione S-transferase P	1	1	42	0.0010	3.1
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	1	1	42	0.0016	63.6
RPL5	60S ribosomal protein L5	1	1	42	0.0002	15.6
RPS17	40S ribosomal protein S17	1	1	41	0.0034	8.7
MDH1	Malate dehydrogenase, cytoplasmic	1	1	41	0.0027	3.3
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	1	1	41	0.0007	38.6
TIMP2	Metalloproteinase inhibitor 2	1	1	41	0.0258	3.7
MIF	Macrophage migration inhibitory factor	1	1	41	4.93E-05	102.8
CNDP2	Cytosolic non-specific dipeptidase	1	1	41	0.0016	3.9
RBBP4	Histone-binding protein RBBP4	1	1	40	0.0100	3.3
TCP1	T-complex protein 1 subunit alpha	1	1	40	0.0049	16.3

Table 3.3.8: List of host cell proteins, the expression of which decreased after 144hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
C3	Complement C3	7	7	437	0.0017	4.4
THBS1	thrombospondin-1	5	4	275	0.0348	2.0
APLP2	Amyloid-like protein 2	3	3	231	0.0004	1.6
AGRN	agrin-like isoform 1	3	3	159	0.0035	9.3
C1ra	Complement C1r-A subcomponent	2	2	134	0.0019	4.5
NPC2	Epididymal secretory protein E1	2	2	125	0.0427	29.8
TIMP1	Metalloproteinase inhibitor 1	2	2	103	0.0001	2.9
MFGE8	Lactadherin	2	2	94	0.0006	1.6
OLFML1	Olfactomedin-like protein 3	2	2	91	2.44E-05	4.3
MMP9	Matrix metalloproteinase-9	2	2	89	0.0015	4.1
PRDX1	Peroxiredoxin-1	2	2	81	0.0067	1.9
LIFR	Leukemia inhibitory factor	1	1	81	0.0077	5.2
GLG1	Golgi apparatus protein 1	1	1	74	0.0099	3.4
OAF	Out at first protein homolog	1	1	73	0.0001	5.6
TGFB1	Transforming growth factor beta-1	1	1	71	0.0025	1.6
LDLR	Low-density lipoprotein receptor	1	1	70	0.0101	2.1
MAN2A1	Alpha-mannosidase 2	1	1	67	0.0184	1.8
GUSB	Beta-glucuronidase	1	1	65	0.0013	4.4
GPC1	Glypican-1	1	1	65	0.0015	3.7
BTD	biotinidase	1	1	64	0.0288	97.3
EXT2	Exostosin-2	1	1	60	0.0115	41.0
ABP1	amiloride-sensitive amine oxidase	1	1	60	0.0014	8.2
PRCP	lysosomal Pro-X carboxypeptidase-like	1	1	56	0.0299	1.8
ADAM10	Disintegrin and metalloproteinase domain-containing protein 10	1	1	51	0.0218	58.2
EPDR1	Mammalian ependymin-related protein 1	1	1	47	0.0009	7.9
MMP19	Matrix metalloproteinase-19	1	1	46	0.0123	3.3
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	1	1	45	0.0134	9.6
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	43	0.0086	2.7
CEP192	Centrosomal protein of 192 kDa	1	1	43	0.0001	2.0
PTHLH	Parathyroid hormone-related protein	1	1	42	0.0002	12.2

Table 3.3.9: Number of differentially expressed proteins between 31˚C and 37˚C at 24hrs post temperature shift in the culture supernatant of an IgG producing DP12 cell line. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	37˚C vs 31˚C 24hrs					
	Total		Up at 31˚C		Down at 31˚C	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	150	66	43	11	107	55
Apoptosis	3	3	0	0	3	3
	CLU, DNASE2, APP	CLU, DNASE2, APP			CLU, DNASE2, APP	CLU, DNASE2, APP
Protease	20	10	0	0	20	10
	DPP7, SCPEP1, TPP1, PRCP, PRSS22, HTRA1, CTSD, CTSH, C1ra, MMP19, MMP9, ADAMTS1, ADAM9, CTSZ, BMP1, CTSA, ADAM10, CTSL1, CTSB, P15156	DPP7, SCPEP1, TPP1, PRCP, PRSS22, HTRA1, CTSD, CTSH, C1ra, MMP19			DPP7, SCPEP1, TPP1, PRCP, PRSS22, HTRA1, CTSD, CTSH, C1ra, MMP19, MMP9, ADAMTS1, ADAM9, CTSZ, BMP1, CTSA, ADAM10, CTSL1, CTSB,P15156	DPP7, SCPEP1, TPP1, PRCP, PRSS22, HTRA1, CTSD, CTSH, C1ra, MMP19
Glycosidase	13	6	0	0	13	6
	GLB1, GAA, MAN2A1, FUCA1, MAN2B1, HEXA, SMPD1, MAN1A1, GLA, GUSB, NEU1, HEXB, NAGA	GLB1, GAA, MAN2A1, FUCA1, MAN2B1, HEXA			GLB1, GAA, MAN2A1, FUCA1, MAN2B1, HEXA, SMPD1, MAN1A1, GLA, GUSB, NEU1, HEXB, NAGA	GLB1, GAA, MAN2A1, FUCA1, MAN2B1, HEXA

Table 3.3.10: List of host cell proteins, the expression of which decreased at 31˚C when compared to 37˚C, 24hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	10	10	600	0.0050	2.9
LAMA5	laminin subunit alpha-5 isoform 1	9	9	585	0.0169	1.9
C3	Complement C3	9	9	522	0.0034	1.7
LAMC1	laminin subunit gamma-1	8	8	458	0.0102	3.3
FN1	Fibronectin	5	5	399	0.0149	2.5
THBS1	thrombospondin-1	7	7	365	0.0102	2.4
GLB1	Beta-galactosidase	5	5	326	0.0007	2.5
GAA	lysosomal alpha-glucosidase-like	5	5	305	0.0003	2.8
LAMB1	Laminin subunit beta-1	4	4	249	0.0073	1.6
DPP7	dipeptidyl peptidase 2-like	4	4	233	0.0018	3.6
SCPEP1	retinoid-inducible serine carboxypeptidase	3	3	210	0.0015	2.0
CLSTN1	Calsyntenin-1	3	3	207	0.0073	2.8
CLU	Clusterin	3	3	207	0.0036	2.5
NUCB2	nucleobindin-2-like	2	2	198	0.0112	3.7
CCDC8	coiled-coil domain-containing protein 80-like	3	3	190	0.0249	2.1
TPP1	tripeptidyl-peptidase 1-like	3	3	189	0.0129	1.6
PRCP	lysosomal Pro-X carboxypeptidase-like	3	3	181	0.0033	2.2
OLFML1	Olfactomedin-like protein 3	3	3	179	0.0002	1.7
HSPA13	Heat shock 70 kDa protein 13	3	3	178	0.0013	2.8
DNASE2	deoxyribonuclease-2-alpha-like	3	3	168	0.0136	2.4
SEMA3C	semaphorin-3C	3	3	167	0.0093	2.8
APLP2	Amyloid-like protein 2	2	2	145	0.0197	2.5
DCN	decorin-like	3	3	145	0.0023	2.7
PLBD2	putative phospholipase B-like 2	3	3	144	0.0136	5.1
FAM3C	protein FAM3C-like	2	2	136	0.0306	7.8
SDF4	45 kDa calcium-binding protein	3	3	134	0.0474	2.5
PRSS22	brain-specific serine protease 4-like	2	2	132	0.0035	3.0
PXDN	peroxidasin homolog	2	2	130	0.0188	2.4
MAN2A1	Alpha-mannosidase 2	3	3	129	0.0058	2.9
EPDR1	Mammalian ependymin-related protein 1	2	2	126	0.0093	2.6

NUCB1	Nucleobindin-1	2	2	125	0.0139	3.1
FUCA1	tissue alpha-L-fucosidase	2	2	124	0.0019	2.4
HYOU1	Hypoxia up-regulated protein 1	2	2	124	0.0138	1.7
LTBP1	Latent-transforming growth factor beta-binding protein 1	2	2	122	0.0369	4.5
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	2	2	121	0.0111	2.1
ATP6AP1	V-type proton ATPase subunit S1	2	2	120	0.0035	1.9
ASAH1	acid ceramidase-like	2	2	114	0.0003	3.0
THBS3	thrombospondin-3	2	2	113	0.0233	4.6
MAN2B1	lysosomal alpha-mannosidase	2	2	113	0.0211	2.5
SERPINF1	Pigment epithelium-derived factor	2	2	105	0.0204	2.5
HEXA	beta-hexosaminidase subunit alpha	2	2	101	0.0096	2.2
IGHG1	Ig gamma-1 chain C region	2	2	100	0.0198	2.9
MMP9	matrix metalloproteinase-9	1	1	99	0.0140	4.2
TIMP1	metalloproteinase inhibitor 1-like	2	2	98	0.0064	2.9
ATP6AP2	renin receptor-like	2	2	98	0.0070	5.8
VEGFC	Vascular endothelial growth factor C	2	2	98	0.0039	2.4
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	2	2	98	0.0341	1.9
QSOX1	sulfhydryl oxidase 1	2	2	98	0.0118	2.3
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase-like	1	1	97	0.0050	3.8
HTRA1	serine protease HTRA1-like	2	2	97	0.0070	2.6
CTSD	cathepsin D	2	2	96	0.0098	2.7
APP	amyloid beta A4 protein	2	2	96	0.0300	1.5
CTSH	pro-cathepsin H-like	2	2	93	0.0037	4.3
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	2	2	91	0.0089	2.2
VNN1	pantetheinase	1	1	91	0.0082	2.0
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	1	1	90	0.0467	1.8
LIFR	Leukemia inhibitory factor	1	1	89	0.0146	2.8
C1ra	Complement C1r-A subcomponent	2	2	89	0.0125	5.6
SBSN	Suprabasin	1	1	88	0.0399	1.8
MMP19	matrix metalloproteinase-19	2	2	87	0.0257	1.8
SPARC	SPARC-like	2	2	85	0.0375	43.9
SMPD1	Sphingomyelin phosphodiesterase	1	1	75	0.0210	1.9
TGFB1	Transforming growth factor beta-1	1	1	75	0.0054	2.1
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	1	1	74	0.0494	2.1

TOMM22	Mitochondrial import receptor subunit TOM22-like	1	1	74	0.0052	3.5
GLG1	Golgi apparatus protein 1 precursor	1	1	74	0.0185	1.6
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	73	0.0137	3.3
SEMA3E	semaphorin-3E	1	1	73	0.0369	1.7
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	1	1	73	0.0184	1.9
N/A	Ig heavy chain V-III region WEA	1	1	72	0.0242	33.8
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	1	1	69	0.0246	2.2
GLA	Alpha-galactosidase A	1	1	68	0.0114	2.0
CTSZ	Cathepsin Z	1	1	65	0.0024	9.0
NPPA	Atrial natriuretic factor	1	1	64	0.0252	2.5
GNS	N-acetylglucosamine-6-sulfatase	1	1	63	0.0053	3.0
COL6A1	Collagen alpha-1(VI) chain	1	1	62	0.0192	2.2
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	1	1	62	0.0013	2.0
GUSB	beta-glucuronidase	1	1	62	2.73E-05	2.2
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	1	1	61	0.0162	2.4
ALCAM	CD166 antigen-like	1	1	60	0.0242	2.3
BMP1	Bone morphogenetic protein 1	1	1	57	0.0467	4.3
C1QTNF5	complement C1q tumor necrosis factor-related protein 5-like	1	1	57	0.0290	1.9
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	1	1	57	0.0155	1.6
CTSA	Lysosomal protective protein	1	1	56	0.0168	3.6
TINAG	tubulointerstitial nephritis antigen	1	1	56	0.0439	12.8
NUCB1	Nucleobindin-1	1	1	55	0.0105	4.4
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	1	1	53	0.0069	2.7
CLN5	Ceroid-lipofuscinosis neuronal protein 5	1	1	52	0.0173	4.0
PPIB	peptidyl-prolyl cis-trans isomerase B-like	1	1	52	0.0119	3.5
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	1	1	51	0.0184	2.3
NEU1	Sialidase-1	1	1	51	0.0069	5.0
CTSL1	cathepsin L1-like	1	1	49	0.0063	2.9
HEXB	Beta-hexosaminidase subunit beta	1	1	48	0.0284	2.6
ADM	ADM	1	1	48	0.0019	4.2
PPT1	palmitoyl-protein thioesterase 1-like	1	1	47	0.0043	9.6
EXT2	Exostosin-like 2	1	1	47	0.0368	2.4
B2M	Beta-2-microglobulin	1	1	47	0.0116	3.3
PLA2G7	platelet-activating factor acetylhydrolase-like	1	1	46	0.0339	7.0

LPL	Lipoprotein lipase	1	1	46	0.0077	3.0
TNFAIP6	tumor necrosis factor-inducible gene 6 protein-like	1	1	46	0.0474	2.2
B4GALT1	Beta-1,4-galactosyltransferase 1	1	1	45	0.0118	2.0
NAGA	alpha-N-acetylgalactosaminidase-like	1	1	45	0.0193	2.0
VEGFA	Vascular endothelial growth factor A	1	1	44	0.0187	10.8
CTSB	cathepsin B-like	1	1	44	0.0048	3.7
Psap	sulfated glycoprotein 1	1	1	43	0.0241	6.2
P15156	calcium-dependent serine proteinase-like	1	1	41	0.0195	2.8
IGF2R	Cation-independent mannose-6-phosphate receptor	1	1	41	0.0456	2.4

Table 3.3.11: List of host cell proteins, the expression of which increased at 31˚C when compared to 37˚C, 24hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
TUBB4B	tubulin beta-4B chain	3	3	196	0.0043	2.3
PKM	Pyruvate kinase isozymes M1/M2	3	3	176	0.0026	1.8
IPO5	importin-5-like	2	2	165	0.0081	3.3
ACTN1	Alpha-actinin-1	2	2	162	0.0199	2.2
ANXA1	annexin A1-like	3	3	161	0.0074	2.8
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	2	2	160	0.0226	2.7
TPI1	Triosephosphate isomerase	2	2	141	0.0043	3.1
PTGR1	Prostaglandin reductase 1	2	2	136	0.0122	2.2
TAGLN2	transgelin-2-like	2	2	129	0.0023	9.5
EEF1G	elongation factor 1-gamma	2	2	129	0.0155	1.8
EEF2	elongation factor 2	2	2	123	0.0130	2.2
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	1	1	111	0.0347	1.9
EEF1B2	elongation factor 1-beta-like	1	1	106	0.0002	2.0
PGK1	Phosphoglycerate kinase 1	1	1	98	0.0364	2.9
CFL1	cofilin-1	1	1	88	0.0343	2.3
OLA1	obg-like ATPase 1 isoform 1	1	1	82	0.0225	2.1
HSP90AB1	heat shock protein HSP 90-beta-like	1	1	80	0.0054	1.6
PSME1	Proteasome activator complex subunit 1	1	1	80	0.0147	2.0
DDX39A	ATP-dependent RNA helicase DDX39	1	1	80	0.0055	6.8
Akr1b8	Aldose reductase-related protein 2	1	1	74	0.0063	11.0
RPS10	40S ribosomal protein S10	1	1	66	0.0129	4.5
EZR	Ezrin	1	1	64	0.0040	1.9
RPS16	40S ribosomal protein S16	1	1	64	0.0040	1.5
UGDH	UDP-glucose 6-dehydrogenase	1	1	64	0.0189	1.7
CCT8	T-complex protein 1 subunit theta-like	1	1	63	0.0369	3.3
KPNB1	Importin subunit beta-1	1	1	63	0.0106	2.5
S100A13	Protein S100-A13	1	1	62	0.0246	2.1
EIF5A	Eukaryotic translation initiation factor 5A-1	1	1	61	0.0040	2.4
Gstm6	glutathione S-transferase Mu 6-like	1	1	60	0.0004	24.7
BLVRB	Flavin reductase	1	1	57	0.0453	5.9

KIF27	Kinesin-like protein KIF27	1	1	56	0.0487	3.3
ANXA2	Annexin A2	1	1	53	0.0021	1.9
MAS1	MAS proto-oncogene	1	1	52	0.0251	1.7
KRT5	Keratin, type II cytoskeletal 5	1	1	51	0.0163	6827.8
PABPC1	Polyadenylate-binding protein 1	1	1	49	0.0045	1.6
RAB1A	ras-related protein Rab-1A isoform 1	1	1	47	0.0229	2.5
CCT3	T-complex protein 1 subunit gamma-like	1	1	47	0.0030	3.1
FAT1	protocadherin Fat 1-like	1	1	45	0.0007	2.3
NME1	nucleoside diphosphate kinase A-like isoform 1	1	1	44	0.0340	1.5
CAPG	macrophage-capping protein-like	1	1	44	0.0131	2.9
TUBA1C	tubulin alpha-1C chain	1	1	44	0.0196	4.0
PLS3	plastin-3	1	1	42	0.0158	3.0
AKR1A1	alcohol dehydrogenase NADP+	1	1	41	0.0061	3.7

Table 3.3.12: Number of differentially expressed proteins between 31˚C and 37˚C at 144hrs post temperature shift in the culture supernatant of an IgG producing DP12 cell line. Using Uniprot protein database, proteins of biological relevance have been identified and the number of differentially expressed proteins under the relevant classification included in the table. The protein count indicates the number of proteins identified by ≥1 peptides or ≥2 peptides.

	37˚C vs 31˚C 144hrs					
	Total		Up at 31˚C		Down at 31˚C	
	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides	≥1 Peptide	≥2 Peptides
Protein Count	222	77	127	46	95	31
Apoptosis	4	2	1	1	3	1
	CLU, HMOX1, PPID, MAPK1	CLU HMOX1	HMOX1	HMOX1		
Protease	9	5	4	2	5	3
	BMP1, HTRA1, DPP7, P15156, THOP1, MMP19, ADAM17, PSMA5, MMP9	BMP1, HTRA1, DPP7, P15156, THOP1	DPP7, P15156, PSMA, MMP9	DPP7, P15156	BMP1, HTRA1, THOP1, MMP19, ADAM17	BMP1, HTRA1, THOP1
Glycosidase	9	6	5	2	4	4
	GAA, HEXA, NAGLU, FUCA1, MAN2A1, GANAB, GUSB, GLB1, HEXB	GAA, HEXA, NAGLU, FUCA1, MAN2A1, GANAB	NAGLU, FUCA1, GUSB, GLB1, HEXB	NAGLU, FUCA1	GAA, HEXA, MAN2A1, GANAB	GAA, HEXA, MAN2A1, GANAB

Table 3.3.13: List of host cell proteins, the expression of which decreased at 31˚C when compared to 37˚C, 144hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	6	6	359	0.0063	2.0
HTRA1	serine protease HTRA1-like	5	5	309	0.0033	1.9
BMP1	Bone morphogenetic protein 1	6	6	296	0.0006	3.0
SERPINH1	Serpin H1	5	5	294	0.0117	1.6
FN1	Fibronectin	4	4	262	0.0163	1.7
GAA	lysosomal alpha-glucosidase-like	4	4	249	0.0013	2.4
HEXA	beta-hexosaminidase subunit alpha	3	3	228	0.0060	2.7
PLS3	plastin-3	3	3	225	0.0001	1.5
PXDN	peroxidasin homolog	4	4	212	0.0074	1.8
ACTN1	Alpha-actinin-1	4	4	203	0.0046	1.5
DSTN	destrin-like	3	3	193	0.0096	1.7
NCAM1	Neural cell adhesion molecule 1	3	3	175	0.0007	3.8
NEO1	Neogenin	3	3	175	0.0015	2.2
CLU	Clusterin	3	3	172	0.0057	2.8
SEMA4B	semaphorin-4B	3	3	163	0.0105	1.8
TPM3	tropomyosin alpha-3 chain isoform 1	3	1	159	0.0222	1.5
AARS	alanyl-tRNA synthetase, cytoplasmic-like	3	3	158	0.0004	2.0
TPM2	Tropomyosin beta chain	3	1	152	0.0399	1.9
RDX	radixin	3	3	149	0.0041	2.0
MAN2A1	Alpha-mannosidase 2	2	2	149	0.0057	1.6
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	2	2	137	0.0094	2.4
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	2	2	136	0.0090	2.1
Psap	sulfated glycoprotein 1	2	2	126	0.0231	5.0
FERMT2	Fermitin family-like 2	2	2	116	0.0127	1.8
GANAB	neutral alpha-glucosidase AB isoform 1	2	2	110	0.0080	1.6
CSPG4	chondroitin sulfate proteoglycan 4	2	2	106	0.0045	1.8
LGALS3	galectin-3-like	2	2	104	0.0104	1.8
THOP1	thimet oligopeptidase-like	2	2	104	0.0131	1.6
HYOU1	Hypoxia up-regulated protein 1	2	2	104	0.0156	1.6
NAMPT	Nicotinamide phosphoribosyltransferase	2	2	92	0.0101	1.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	2	2	91	0.0049	2.0

CLSTN1	Calsyntenin-1	1	1	89	0.0146	3.2
CLSTN1	Calsyntenin-1	1	1	88	0.0043	2.7
G6PD	Glucose-6-phosphate 1-dehydrogenase	1	1	80	0.0426	29.9
OAF	Out at first protein homolog	1	1	80	0.0018	3.1
SEMA3E	semaphorin-3E	1	1	77	0.0012	5.0
PGAM1	Phosphoglycerate mutase 1	1	1	71	0.0040	1.7
EEF1D	Elongation factor 1-delta	1	1	70	0.0075	1.6
PDXK	Pyridoxal kinase	1	1	67	0.0375	1.7
CDC37L1	hsp90 co-chaperone Cdc37-like	1	1	67	0.0426	1.6
VASN	vasorin-like	1	1	66	0.0078	2.9
TGFB1	Transforming growth factor beta-1	1	1	65	0.0005	2.5
MMP19	matrix metalloproteinase-19	1	1	65	0.0111	1.8
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	1	1	64	0.0380	37.6
GOLM1	Golgi membrane protein 1	1	1	62	0.0019	4.2
MAMDC2	MAM domain-containing protein 2	1	1	60	0.0231	2.0
CNBP	cellular nucleic acid-binding protein isoform 3	1	1	60	0.0491	13.4
CANT1	soluble calcium-activated nucleotidase 1	1	1	58	0.0282	1.9
SERPINI1	neuroserpin-like	1	1	58	0.0224	6.6
PRKCSH	Glucosidase 2 subunit beta	1	1	57	0.0016	1.8
PRMT5	Protein arginine N-methyltransferase 5	1	1	57	0.0386	1.7
CLN5	Ceroid-lipofuscinosis neuronal protein 5	1	1	56	0.0089	2.1
ARPC1B	actin-related protein 2/3 complex subunit 1B	1	1	56	0.0239	2.1
ACTA1	actin, alpha skeletal muscle	1	1	56	0.0222	4.6
????	putative E3 ubiquitin-protein ligase KIAA0614	1	1	56	0.0246	1.6
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma-like	1	1	55	0.0012	2.4
CALU	Calumenin	1	1	55	0.0494	1.6
ATP6AP2	renin receptor-like	1	1	55	0.0381	1.9
P55060	exportin-2-like	1	1	54	0.0121	31.2
H2-D1	H-2 class I histocompatibility antigen, D-D alpha chain	1	1	54	0.0076	1.8
EXT2	Exostosin-like 2	1	1	54	0.0039	2.3
THBS3	thrombospondin-3	1	1	54	0.0049	4.4
RPL19	60S ribosomal protein L19 isoform 2	1	1	54	0.0360	1.7
LIFR	Leukemia inhibitory factor	1	1	53	0.0157	2.2
TM6SF2	Transmembrane 6 superfamily member 2	1	1	53	0.0062	1.6
PRPS1	Ribose-phosphate pyrophosphokinase 1	1	1	53	0.0343	1.9
RANBP1	ran-specific GTPase-activating protein-like	1	1	53	0.0490	2.2
SERPINF1	Pigment epithelium-derived factor	1	1	52	0.0004	4.1

ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	52	0.0108	1.8
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	52	0.0003	3.2
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	50	0.0001	1.9
PPID	peptidyl-prolyl cis-trans isomerase D-like, partial	1	1	50	0.0057	1.9
PLOD3	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	1	1	50	0.0004	4.0
AMPD2	AMP deaminase 2	1	1	50	0.0071	1.9
CAP1	adenylyl cyclase-associated protein 1-like isoform 1	1	1	50	0.0488	32.5
MAP6	Microtubule-associated protein 6	1	1	49	0.0322	1.7
CFL1	cofilin-1	1	1	49	0.0491	2.2
TNFAIP6	tumor necrosis factor-inducible gene 6 protein-like	1	1	48	0.0049	1.7
PSAT1	Phosphoserine aminotransferase	1	1	48	0.0026	1.8
RPA1	Replication protein A 70 kDa DNA-binding subunit	1	1	47	0.0281	1.7
YWHAG	14-3-3 protein gamma	1	1	46	0.0140	1.8
MINPP1	Multiple inositol polyphosphate phosphatase 1	1	1	46	0.0395	1.6
PDIA4	protein disulfide-isomerase A4	1	1	45	0.0133	1.8
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	1	1	45	0.0131	1.6
CAND1	cullin-associated NEDD8-dissociated protein 1-like	1	1	45	0.0083	3.0
Cald1	Non-muscle caldesmon	1	1	45	0.0319	1.6
SLC3A2	4F2 cell-surface antigen heavy chain	1	1	45	0.0024	2.2
FKBP4	FK506-binding protein 4	1	1	44	0.0007	2.6
TNFSF9	tumor necrosis factor ligand superfamily member 9-like	1	1	44	0.0001	4.9
RPS12	40S ribosomal protein S12	1	1	44	0.0217	417.0
VEGFA	Vascular endothelial growth factor A	1	1	43	0.0005	4.8
STC2	stanniocalcin-2-like	1	1	43	0.0028	2.7
SEPT6	Septin-6	1	1	41	0.0434	1.5
TRMT10C	Mitochondrial ribonuclease P protein 1	1	1	41	0.0250	1.5
MAPK1	Mitogen-activated protein kinase 1	1	1	41	0.0008	1.6

Table 3.3.14: List of host cell proteins, the expression of which increased at 31˚C when compared to 37˚C, 144hrs post temperature shift, identified during quantitative label free LC/MS analysis of cell culture supernatant from an IgG secreting DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
VCP	Transitional endoplasmic reticulum ATPase	9	9	554	0.0047	1.7
TUBB4B	Tubulin beta-2C chain	8	8	453	0.0014	3.4
VIM	vimentin	7	7	419	0.0007	1.8
DHX9	ATP-dependent RNA helicase A	5	5	300	1.41E-05	3.5
LAMA5	laminin subunit alpha-5 isoform 1	5	5	278	0.0026	1.7
HSPA8	heat shock cognate 71 kDa protein	4	4	274	0.0042	1.5
DPP7	dipeptidyl peptidase 2-like	4	4	232	0.0026	1.6
ALDOA	fructose-bisphosphate aldolase A isoform 1	4	4	224	0.0274	1.7
IDH1	isocitrate dehydrogenase	4	4	220	0.0018	2.0
RAB7A	ras-related protein Rab-7a-like	4	4	216	0.0041	2.6
NAGLU	alpha-N-acetylglucosaminidase-like	3	3	212	0.0044	2.4
SERPINB1	leukocyte elastase inhibitor A	3	3	208	0.0028	2.1
PHGDH	d-3-phosphoglycerate dehydrogenase-like	3	3	197	2.35E-05	2.6
COL6A1	Collagen alpha-1(VI) chain	3	3	185	0.0223	1.9
HSPA5	78 kDa glucose-regulated protein	3	3	179	0.0071	1.8
CCDC8	coiled-coil domain-containing protein 80-like	3	3	175	0.0014	2.6
SEMA3C	semaphorin-3C	3	3	175	0.0073	1.7
LAMC1	laminin subunit gamma-1	3	3	175	0.0251	1.6
FUCA1	tissue alpha-L-fucosidase	3	3	170	0.0031	2.4
MFGE8	Lactadherin	3	3	166	2.17E-05	4.2
P15156	calcium-dependent serine proteinase-like	3	3	165	0.0013	2.4
PLA2G7	Platelet-activating factor acetylhydrolase	3	3	158	0.0097	3.1
PPIA	Peptidyl-prolyl cis-trans isomerase A	3	3	145	0.0093	1.8
Gstm6	Glutathione S-transferase Mu 6	3	2	222	0.0001	7.9
GSTM5	glutathione S-transferase Mu 5-like	3	2	199	0.0003	44.1
GSTM1	glutathione S-transferase Mu 1-like	3	2	184	0.0032	1.7
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	3	1	201	0.0046	5.4
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	3	1	183	0.0250	2.0
TAGLN2	transgelin-2-like	2	2	149	0.0014	1.8
HMOX1	heme oxygenase 1-like	2	2	144	0.0093	1.6

UGDH	UDP-glucose 6-dehydrogenase	2	2	141	4.27E-05	3.0
AKR1A1	alcohol dehydrogenase NADP+	2	2	137	0.0024	2.1
SBSN	Suprabasin	2	2	135	0.0064	1.6
FTH1	Ferritin heavy chain	2	2	134	0.0056	2.7
PSMD4	26S proteasome non-ATPase regulatory subunit 4	2	2	131	0.0041	2.3
HSPE1	10 kDa heat shock protein, mitochondrial-like	2	2	130	0.0092	1.6
HIST1H2AG	Histone H2A type 1	2	2	115	0.0021	2.0
EWSR1	RNA-binding protein EWS	2	2	110	0.0010	2.7
CIRBP	Cold-inducible RNA-binding protein	2	2	109	0.0018	3.1
APRT	adenine phosphoribosyltransferase-like	2	2	108	0.0010	2.1
QSOX1	sulfhydryl oxidase 1	2	2	103	0.0066	3.2
PCBP1	Poly(rC)-binding protein 1	2	2	102	0.0016	2.9
AHNAK	Neuroblast differentiation-associated protein AHNAK	2	2	98	0.0044	2.1
ANXA2	Annexin A2	2	2	96	0.0067	1.8
C3	Complement C3	2	2	92	0.0095	2.4
GSS	glutathione synthetase-like	2	2	88	0.0197	1.5
PSMA5	proteasome subunit alpha type-5	1	1	108	0.0107	2.2
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	1	1	100	0.0046	1.7
NRP1	neuropilin-1	1	1	99	0.0011	2.2
GUSB	beta-glucuronidase	1	1	97	0.0041	2.0
PSMD2	26S proteasome non-ATPase regulatory subunit 2	1	1	89	0.0171	4.7
CAT	Catalase	1	1	86	0.0073	2.0
LXN	latexin-like	1	1	83	0.0007	4.8
PLEC	Plectin	1	1	79	0.0006	9.0
ADPRH	ADP-ribosylarginine hydrolase	1	1	78	0.0027	3.4
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	76	0.0008	1.7
FAT1	protocadherin Fat 1-like	1	1	76	2.38E-07	4.5
NONO	Non-POU domain-containing octamer-binding protein	1	1	76	0.0011	3.5
LOXL1	Lysyl oxidase-like 1	1	1	75	0.0419	2.1
GCLM	glutamate--cysteine ligase regulatory subunit-like	1	1	75	0.0002	2.2
RPL9	60S ribosomal protein L9	1	1	74	0.0296	1.5
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	1	1	73	0.0004	2.8
EZR	Ezrin	1	1	72	0.0041	2.3
OSTF1	osteoclast-stimulating factor 1-like	1	1	71	0.0185	2.2

MMP9	matrix metalloproteinase-9	1	1	70	0.0315	1.7
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	1	1	70	0.0017	1.8
HPRT1	hypoxanthine-guanine phosphoribosyltransferase-like	1	1	69	0.0318	1.8
OLA1	obg-like ATPase 1 isoform 1	1	1	68	0.0035	1.5
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B-like	1	1	67	0.0176	1.5
RBM3	Putative RNA-binding protein 3	1	1	66	0.0008	30.7
PGD	6-phosphogluconate dehydrogenase, decarboxylating-like	1	1	66	0.0256	1.7
RPS10	40S ribosomal protein S10	1	1	63	0.0173	1.9
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	1	1	62	0.0037	1.6
Testin-2	Testin-2	1	1	62	0.0021	7.4
	Ig kappa chain C region OS=Homo sapiens GN=IGKC PE=1 SV=1	1	1	61	0.0028	2.2
LGALS3BP	galectin-3-binding protein-like	1	1	61	0.0015	3.9
RPS21	40S ribosomal protein S21-like	1	1	61	0.0494	1.6
TYMS	thymidylate synthase-like	1	1	60	0.0036	27.4
PTBP1	Polypyrimidine tract-binding protein 1	1	1	59	0.0444	1.5
THBS1	Thrombospondin-1	1	1	59	0.0065	1.7
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	1	1	58	0.0156	1.9
RBM8A	RNA-binding protein 8A	1	1	58	0.0063	1.7
UGP2	UTP--glucose-1-phosphate uridylyltransferase	1	1	57	0.0007	2.8
P4hb	Protein disulfide-isomerase	1	1	56	0.0188	1.6
HDLBP	vigilin-like	1	1	56	0.0002	4.0
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic-like	1	1	56	0.0018	4.9
UBA1	ubiquitin-like modifier-activating enzyme 1-like	1	1	56	0.0381	1.6
PRMT1	protein arginine N-methyltransferase 1 isoform 1	1	1	55	0.0026	2.1
PKM	Pyruvate kinase isozymes M1/M2	1	1	55	0.0087	1.6
RNH1	ribonuclease inhibitor-like	1	1	55	0.0012	2.0
COL5A1	Collagen alpha-1(V) chain	1	1	54	0.0002	2.5
SUB1	Activated RNA polymerase II transcriptional coactivator p15	1	1	54	0.0001	1.9
MAPRE1	microtubule-associated protein RP/EB family member 1-like	1	1	53	0.0317	1.8
BOLA1	BolA-like protein 1	1	1	53	0.0416	1.6
FUS	RNA-binding protein FUS	1	1	52	0.0018	7.2
SRXN1	Sulfiredoxin-1	1	1	52	0.0032	2.3
FDPS	Farnesyl pyrophosphate synthetase	1	1	51	0.0005	1.9
GLB1	Beta-galactosidase	1	1	51	0.0500	1.6

PCBP2	Poly(rC)-binding protein 2	1	1	51	0.0019	2.4
CMPK1	UMP-CMP kinase-like	1	1	50	0.0030	2.5
Ctla2b	protein CTLA-2-beta-like	1	1	50	0.0005	3.9
FAH	Fumarylacetoacetase	1	1	49	0.0450	1.6
ADM	ADM	1	1	49	0.0154	3.4
EIF4A2	eukaryotic initiation factor 4A-II	1	1	49	0.0004	2.2
TUBA1C	tubulin alpha-1C chain	1	1	48	0.0001	3.9
CSRP1	cysteine and glycine-rich protein 1-like	1	1	48	0.0016	2.0
SULF2	extracellular sulfatase Sulf-2	1	1	48	0.0125	16.0
GRN	granulins isoform 1	1	1	48	0.0205	5.9
TES	testin-like isoform 1	1	1	48	0.0001	1.6
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	1	1	48	0.0041	2.2
RPL26	60S ribosomal protein L26	1	1	46	0.0312	2.5
PARVA	alpha-parvin-like	1	1	46	0.0266	2.5
PLTP	phospholipid transfer protein	1	1	46	0.0374	1.5
PPCS	phosphopantothenate--cysteine ligase-like	1	1	45	0.0039	2.2
RPS19	40S ribosomal protein S19-like, partial	1	1	45	0.0061	2.1
HEXB	Beta-hexosaminidase subunit beta	1	1	45	0.0387	2.1
LDHA	L-lactate dehydrogenase A chain	1	1	45	0.0001	3.0
SSB	Sjogren syndrome antigen B	1	1	44	0.0245	2.0
RPL31	60S ribosomal protein L31-like	1	1	43	0.0244	1.6
RAB6A	Ras-related protein Rab-6A	1	1	43	0.0157	1.8
HNRNPU	heterogeneous nuclear ribonucleoprotein U	1	1	43	0.0070	3.4
NEDD4	E3 ubiquitin-protein ligase NEDD4	1	1	42	0.0043	2.4
DDB1	DNA damage-binding protein 1-like	1	1	42	0.0002	1.9
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	1	1	41	0.0098	1.8
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	1	1	41	0.0013	2.6
RCN1	Reticulocalbin-1	1	1	40	0.0012	4.5
CALR	Calreticulin	1	1	40	0.0040	2.1

Table 3.3.15: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 37˚C culture. The list below displays host cell proteins that were found to correlate negatively (decrease in expression) with time in a DP12 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
NRP1	neuropilin-1	-0.996	0.0004	1	1	73	3.12E-05	3.3
GM2A	ganglioside GM2 activator-like	-0.994	0.0006	1	1	42	0.0478	7.7
COL6A1	collagen alpha-1(VI) chain	-0.990	0.0013	5	5	272	1.54E-05	4.8
NID1	Nidogen-1	-0.984	0.0024	5	3	270	5.75E-06	3.6
LOXL3	Lysyl oxidase-like 3	-0.982	0.0029	1	1	95	4.99E-06	4.4
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	-0.976	0.0044	4	4	271	5.00E-06	5.4
FSTL1	Follistatin-related protein 1	-0.975	0.0047	1	1	43	4.18E-06	6.8
N/A	Salivary plasminogen activator alpha 2	-0.975	0.0048	1	1	52	0.0006	7.1
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	-0.973	0.0052	4	4	216	0.0001	3.0
CHOPROTEASE	calcium-dependent serine proteinase-like	-0.972	0.0057	6	6	312	5.43E-06	4.5
ABP1	amiloride-sensitive amine oxidase	-0.970	0.0062	4	4	253	0.0034	7.7
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	-0.968	0.0069	1	1	89	0.0075	2.0
THBS1	thrombospondin-1	-0.965	0.0079	10	10	491	0.0001	8.0
PLA2G7	Platelet-activating factor acetylhydrolase	-0.964	0.0082	5	5	304	6.38E-06	6.9
IFNAR2	Interferon-alpha/beta receptor beta chain	-0.961	0.0093	1	1	50	7.11E-06	4.2
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	-0.960	0.0097	1	1	84	0.0015	4.5
SEMA4B	Semaphorin-4B	-0.959	0.0098	1	1	47	0.0495	1.7
CTSH	pro-cathepsin H-like	-0.959	0.0098	1	1	51	1.07E-05	4.0
LAMB1	laminin subunit beta-1	-0.959	0.0099	7	7	391	2.35E-07	9.5
VNN1	pantetheinase	-0.957	0.0105	1	1	91	0.0006	1.7
CTSL1	cathepsin L1-like	-0.957	0.0107	1	1	83	0.0002	5.4
SEMA3C	semaphorin-3C	-0.957	0.0108	5	5	305	0.0001	11.1
DNASE2	deoxyribonuclease-2-alpha-like	-0.954	0.0119	3	3	175	1.78E-05	3.6
PRCP	lysosomal Pro-X carboxypeptidase-like	-0.946	0.0148	2	2	128	0.0001	3.9
FUCA1	tissue alpha-L-fucosidase	-0.946	0.0148	1	1	91	0.0008	3.1

TPP1	tripeptidyl-peptidase 1-like	-0.945	0.0152	1	1	46	0.0002	12.5
DNAJB3	DnaJ-like subfamily C member 3	-0.944	0.0156	1	1	52	0.0020	5.3
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	-0.944	0.0158	2	2	97	4.44E-05	5.5
EXT2	Exostosin-2	-0.944	0.0160	1	1	40	0.0030	5.3
UXS1	UDP-glucuronic acid decarboxylase 1	-0.943	0.0164	1	1	47	5.03E-06	6.5
MMP9	matrix metalloproteinase-9	-0.940	0.0176	4	4	248	3.34E-05	7.5
C3	Complement C3	-0.939	0.0179	13	13	668	1.16E-05	27.7
GUSB	beta-glucuronidase	-0.938	0.0185	1	1	44	0.0001	8.9
TFPI	tissue factor pathway inhibitor-like	-0.937	0.0188	2	2	101	0.0005	5.5
GLB1	Beta-galactosidase	-0.936	0.0190	3	3	179	4.14E-06	6.7
GNPTAB	N-acetylglucosamine-1-phosphotransferase subunits alpha/beta	-0.936	0.0194	1	1	93	0.0001	8.9
DKK3	dickkopf-related protein 3-like	-0.934	0.0201	1	1	94	0.0466	2.2
VEGFC	Vascular endothelial growth factor C	-0.934	0.0202	1	1	54	3.01E-06	6.1
BTD	biotinidase	-0.934	0.0203	1	1	95	7.89E-06	4.3
GOLM1	Golgi membrane protein 1	-0.928	0.0227	1	1	85	0.0002	2.6
LOXL4	Lysyl oxidase-like 4	-0.928	0.0227	1	1	51	0.0045	4.5
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	-0.928	0.0232	3	3	194	0.0001	3.1
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	-0.925	0.0244	4	4	266	1.04E-07	7.8
COL5A2	Collagen alpha-2(V) chain	-0.925	0.0245	1	1	60	2.84E-06	4.0
OLFML1	Olfactomedin-like protein 3	-0.924	0.0248	3	3	194	5.26E-09	8.6
LOXL1	Lysyl oxidase-like 1	-0.924	0.0249	1	1	95	0.0154	3.2
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2-like	-0.922	0.0257	1	1	44	0.0009	7.5
GPC1	Glypican-1	-0.921	0.0262	2	2	132	0.0004	2.9
CSF1	macrophage colony-stimulating factor 1 isoform 1	-0.919	0.0272	1	1	43	0.0061	3.9
HTRA1	serine protease HTRA1-like	-0.916	0.0290	4	4	267	2.32E-07	3.7
EXT2	Exostosin-like 2	-0.915	0.0296	1	1	40	0.0369	8.2
TOMM22	Mitochondrial import receptor subunit TOM22-like	-0.913	0.0304	1	1	76	0.0345	46.7
SGSH	N-sulphoglucosamine sulphohydrolase-like	-0.906	0.0342	1	1	74	0.0137	2.7
CANT1	soluble calcium-activated nucleotidase 1	-0.904	0.0350	1	1	43	0.0002	2.9
HSPA13	Heat shock 70 kDa protein 13	-0.900	0.0375	3	3	168	8.52E-07	3.3

NAGA	alpha-N-acetylgalactosaminidase-like	-0.897	0.0392	2	2	132	0.0002	3.3
SDF4	45 kDa calcium-binding protein	-0.895	0.0399	1	1	47	0.0037	2.1
TGFBR3	TGF-beta receptor type III	-0.888	0.0443	1	1	46	0.0014	8.8
NID1	Nidogen-1	-0.884	0.0466	3	1	166	0.0006	2.7
CSPG4	chondroitin sulfate proteoglycan 4	-0.884	0.0469	6	6	355	0.0004	2.2

Table 3.3.16: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 37˚C culture. The list below displays host cell proteins that were found to correlate positively (increase in expression) with time in a DP12 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
HIST1H2AG	Histone H2A type 1	0.994	0.0005	2	1	134	9.10E-06	14.9
RPS11	40S ribosomal protein S11-like	0.992	0.0009	1	1	63	0.0104	15.7
EEF2	elongation factor 2	0.991	0.0010	6	6	308	1.32E-06	14.9
RPS21	40S ribosomal protein S21-like	0.989	0.0013	3	3	148	7.70E-06	19.7
RPL7A	60S ribosomal protein L7a	0.988	0.0015	1	1	80	0.0408	24.1
CORO1B	coronin-1B	0.986	0.0019	1	1	53	0.0011	60.7
RPS15A	40S ribosomal protein S15a	0.986	0.0021	1	1	49	3.06E-07	9.5
RPS2	40S ribosomal protein S2	0.984	0.0025	1	1	52	0.0001	24.7
EIF4E	Eukaryotic translation initiation factor 4E	0.982	0.0028	1	1	40	0.0353	11.1
S100A13	Protein S100-A13	0.982	0.0028	1	1	44	1.92E-07	5.7
PCBP1	Poly(rC)-binding protein 1	0.982	0.0029	1	1	44	7.59E-07	6.9
NAP1L1	Nucleosome assembly protein 1-like 1	0.981	0.0031	1	1	61	1.04E-05	7.9
TAGLN2	transgelin-2-like	0.981	0.0031	3	3	203	1.07E-08	12.3
CAPZB	F-actin-capping protein subunit beta	0.981	0.0032	1	1	98	1.44E-07	7.4
CAPZA1	F-actin-capping protein subunit alpha-1	0.980	0.0034	1	1	60	0.0001	20.0
CCT6A	T-complex protein 1 subunit zeta	0.980	0.0034	1	1	61	0.0265	4.5
SKP1	S-phase kinase-associated protein 1	0.979	0.0036	1	1	67	8.04E-06	4.4
RPL29	60S ribosomal protein L29	0.978	0.0038	1	1	57	0.0178	32.0
CAT	Catalase	0.978	0.0039	1	1	87	0.0126	4.8
LDHA	L-lactate dehydrogenase A chain	0.977	0.0041	4	4	250	6.33E-08	5.1
CAND1	cullin-associated NEDD8-dissociated protein 1-like	0.977	0.0042	2	2	98	0.0001	16.0
SSB	Sjogren syndrome antigen B	0.976	0.0045	1	1	57	0.0013	3.1
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	0.975	0.0047	1	1	48	0.0007	5.8
GSTP1	glutathione S-transferase P 1	0.975	0.0047	1	1	56	0.0022	19.3
D17Wsu104e	UPF0556 protein C19orf10 homolog	0.975	0.0047	1	1	54	0.0001	16.6
SERPINH1	Serpin H1	0.975	0.0048	4	4	236	2.53E-06	4.7
RPS3A	40S ribosomal protein S3a	0.975	0.0048	3	3	178	4.71E-05	9.0
CDC42	Cell division control protein 42 homolog	0.974	0.0049	1	1	59	0.0006	36.0
NPM1	Nucleophosmin	0.974	0.0050	1	1	46	0.0061	95.8
HYOU1	Hypoxia up-regulated protein 1	0.974	0.0050	3	3	144	0.0011	2.2
CCT3	T-complex protein 1 subunit gamma-like	0.974	0.0050	2	2	97	0.0001	8.6
C14orf166	UPF0568 protein C14orf166-like	0.974	0.0050	1	1	41	0.0001	11.9

GDI2	rab GDP dissociation inhibitor beta-like	0.971	0.0058	3	3	144	1.68E-06	3.3
TPI1	Triosephosphate isomerase	0.971	0.0060	2	2	174	1.06E-05	22.8
ALDOA	fructose-bisphosphate aldolase A isoform 1	0.970	0.0061	2	2	125	3.30E-05	6.0
RPS16	40S ribosomal protein S16	0.969	0.0065	1	1	53	0.0001	7.8
PTGR1	prostaglandin reductase 1-like	0.969	0.0065	4	4	219	7.51E-06	8.3
LGALS1	Galectin-1	0.969	0.0065	1	1	56	0.0497	7.0
SNRPD2	Small nuclear ribonucleoprotein Sm D2	0.969	0.0067	1	1	56	0.0055	26.7
RNH1	ribonuclease inhibitor-like	0.967	0.0071	1	1	58	0.0030	20.4
IPO5	importin-5-like	0.966	0.0074	3	3	214	5.68E-09	8.5
TPM2	Tropomyosin beta chain	0.963	0.0085	1	1	66	0.0051	277.8
EEF1G	elongation factor 1-gamma	0.962	0.0088	4	4	242	4.54E-07	11.1
EFHD2	EF-hand domain-containing protein D2	0.962	0.0088	1	1	54	0.0004	6.6
CDC37L1	hsp90 co-chaperone Cdc37-like	0.961	0.0090	1	1	53	0.0001	6.2
EIF3G	eukaryotic translation initiation factor 3 subunit G-like	0.961	0.0091	1	1	54	0.0098	3.7
NANS	Sialic acid synthase	0.961	0.0092	1	1	69	0.0058	46.1
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	0.960	0.0094	1	1	58	1.79E-05	11.2
SNRPE	small nuclear ribonucleoprotein E-like	0.960	0.0095	1	1	60	0.0001	10.7
PDIA6	Protein disulfide-isomerase A6	0.959	0.0100	4	4	291	3.45E-06	5.3
UGDH	UDP-glucose 6-dehydrogenase	0.958	0.0102	4	4	260	2.35E-05	2.7
TALDO1	Transaldolase	0.955	0.0114	2	2	108	2.78E-08	9.0
ST13	Hsc70-interacting protein	0.954	0.0116	1	1	57	0.0002	10.1
VIM	vimentin	0.954	0.0117	9	9	500	1.72E-09	5.7
NUDC	Nuclear migration protein nudC	0.954	0.0119	1	1	58	0.0005	4.0
H1F0	histone H1.0-like	0.953	0.0121	1	1	58	0.0428	8.0
RPL19	60S ribosomal protein L19 isoform 2	0.953	0.0123	1	1	59	0.0356	33.2
AHCY	adenosylhomocysteinase	0.950	0.0135	5	5	286	4.42E-09	11.9
AKR1A1	alcohol dehydrogenase	0.949	0.0135	3	2	146	2.02E-06	4.3
RPL12	60S ribosomal protein L12	0.949	0.0136	1	1	49	1.41E-05	4.2
PSMB8	Proteasome subunit beta type-8	0.947	0.0144	1	1	64	0.0001	13.6
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic-like	0.947	0.0145	2	2	123	1.00E-07	5.5
TCP1	T-complex protein 1 subunit alpha	0.947	0.0146	3	3	195	0.0014	13.8
ACTR3	Actin-related protein 3	0.946	0.0151	2	2	150	0.0034	21.4
YWHAH	14-3-3 protein eta	0.945	0.0153	4	3	259	1.98E-08	9.0
CCT4	T-complex protein 1 subunit delta	0.945	0.0154	3	3	153	0.0011	23.7
CRELD2	Cysteine-rich with EGF-like domain protein 2	0.944	0.0157	1	1	77	0.0194	55.5
CCT8	T-complex protein 1 subunit theta-like	0.943	0.0162	2	2	177	0.0001	4.1
RPS25	40S ribosomal protein S25	0.943	0.0163	1	1	65	0.0185	58.7
DDTL	D-dopachrome decarboxylase-like	0.943	0.0164	1	1	48	1.28E-05	7.6
CBR1	Carbonyl reductase	0.941	0.0169	2	2	104	1.47E-05	12.9

DDX39B	Spliceosome RNA helicase BAT1	0.940	0.0175	1	1	40	0.0009	5.7
PGD	6-phosphogluconate dehydrogenase, decarboxylating-like	0.940	0.0176	4	4	227	1.03E-08	5.3
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	0.938	0.0184	2	2	122	0.0001	10.3
PSMD4	26S proteasome non-ATPase regulatory subunit 4	0.937	0.0187	1	1	63	0.0001	3.5
PLS3	Plastin-3	0.937	0.0188	1	1	51	0.0037	10.8
HSP90B1	endoplasmin	0.937	0.0189	4	4	230	9.67E-07	8.5
RPS17	40S ribosomal protein S17	0.937	0.0190	1	1	58	0.0001	9.5
HPRT1	hypoxanthine-guanine phosphoribosyltransferase-like	0.936	0.0191	1	1	48	0.0011	2.8
CFL1	cofilin-1	0.936	0.0191	1	1	48	0.0146	83.5
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	0.935	0.0195	1	1	63	0.0036	69.5
CCT7	T-complex protein 1 subunit eta	0.935	0.0196	2	2	147	0.0050	3.9
HIST1H2AG	Histone H2A type 1	0.935	0.0196	2	1	107	0.0003	2.6
VCP	Transitional endoplasmic reticulum ATPase	0.935	0.0196	4	4	233	2.61E-06	4.7
YWHAB	14-3-3 protein beta/alpha isoform 2	0.935	0.0197	3	2	138	0.0001	22.2
P55060	exportin-2-like	0.934	0.0200	1	1	52	0.0352	9.8
GSTO1	Glutathione S-transferase omega-1	0.934	0.0200	1	1	57	3.85E-07	6.7
CALU	Calumenin	0.933	0.0207	1	1	40	0.0030	3.0
MAPK1	Mitogen-activated protein kinase 1	0.932	0.0213	1	1	41	0.0044	67.1
UBA1	ubiquitin-like modifier-activating enzyme 1-like	0.931	0.0217	2	2	191	0.0003	3.1
RPS12	40S ribosomal protein S12	0.930	0.0218	2	2	84	0.0002	10.0
GSR	glutathione reductase, mitochondrial-like	0.930	0.0220	2	2	117	9.34E-06	5.7
GSS	glutathione synthetase-like	0.930	0.0222	3	3	207	3.37E-06	4.3
PPIA	Peptidyl-prolyl cis-trans isomerase A	0.929	0.0225	2	2	86	0.0001	3.6
PSMB3	Proteasome subunit beta type-3	0.929	0.0226	1	1	102	0.0004	11.1
Cd74	H-2 class II histocompatibility antigen gamma chain	0.928	0.0227	1	1	63	0.0004	40.1
RPLP2	60S acidic ribosomal protein P2	0.928	0.0228	1	1	68	0.0050	17.4
EIF4A2	eukaryotic initiation factor 4A-II	0.927	0.0233	1	1	49	0.0014	Infinity
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	0.927	0.0236	1	1	47	0.0007	6.3
RPS20	40S ribosomal protein S20	0.926	0.0237	1	1	48	0.0001	15.5
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3-like, partial	0.925	0.0242	1	1	40	0.0073	6.3
CNN2	Calponin-2	0.924	0.0251	1	1	64	0.0008	55.8
RPL23	60S ribosomal protein L23	0.923	0.0254	1	1	89	0.0205	3.1
PRDX1	Peroxiredoxin-1	0.922	0.0256	4	3	229	3.44E-06	4.0
EEF1D	Elongation factor 1-delta	0.922	0.0259	1	1	92	0.0001	14.5
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	0.922	0.0260	1	1	66	0.0263	54.9
PEBP1	Phosphatidylethanolamine-binding protein 1	0.920	0.0267	1	1	47	1.69E-05	10.7
MAP6	Microtubule-associated protein 6	0.919	0.0273	1	1	61	0.0001	2.9
PFDN2	Prefoldin subunit 2	0.919	0.0274	1	1	45	1.38E-06	15.9
PKM	Pyruvate kinase isozymes M1/M2	0.918	0.0279	6	6	404	2.45E-05	4.0

VPS35	Vacuolar protein sorting-associated protein 35	0.917	0.0283	1	1	50	9.45E-07	5.4
ANXA1	annexin A1-like	0.916	0.0288	2	2	125	0.0003	2.3
NAP1L4	Nucleosome assembly protein 1-like 4	0.916	0.0289	1	1	63	0.0008	7.5
EML2	Echinoderm microtubule-associated protein-like 2	0.916	0.0289	1	1	46	0.0241	20.1
ILF2	interleukin enhancer-binding factor 2	0.916	0.0291	1	1	72	0.0001	17.6
SERPINB6	serpin B6 isoform 1	0.915	0.0295	1	1	57	0.0247	182.5
GLO1	Lactoylglutathione lyase	0.914	0.0298	2	2	117	6.22E-06	5.4
PPID	peptidyl-prolyl cis-trans isomerase D-like, partial	0.914	0.0299	1	1	50	0.0004	10.3
CAPG	Macrophage-capping protein	0.914	0.0301	1	1	85	5.16E-06	4.0
PDIA4	protein disulfide-isomerase A4	0.914	0.0301	2	2	87	0.0001	12.3
AK2	Adenylate kinase 2, mitochondrial	0.913	0.0301	1	1	60	0.0479	31.1
GPI	glucose-6-phosphate isomerase	0.913	0.0306	2	2	108	4.68E-05	4.5
CLN5	Ceroid-lipofuscinosis neuronal protein 5	0.912	0.0311	1	1	45	0.0343	1.8
PDIA3	Protein disulfide-isomerase A3	0.912	0.0312	4	4	209	8.20E-07	3.1
N/A	hypothetical protein LOC100760484	0.911	0.0316	1	1	62	1.30E-05	4.5
HSPA5	78 kDa glucose-regulated protein	0.910	0.0321	5	5	228	1.63E-08	4.2
RBBP4	Histone-binding protein RBBP4	0.909	0.0325	1	1	44	0.0002	Infinity
ACTN4	Alpha-actinin-4	0.908	0.0328	4	2	222	4.83E-05	4.6
STIP1	Stress-induced-phosphoprotein 1	0.907	0.0334	1	1	49	0.0016	8.0
CCT5	T-complex protein 1 subunit epsilon-like isoform 1	0.907	0.0336	2	2	139	0.0014	13.7
TXNRD1	thioredoxin reductase 1	0.907	0.0337	2	2	143	0.0003	7.0
Q00285	Glutathione S-transferase Y1	0.906	0.0338	1	1	82	5.11E-07	4.0
TBCB	Tubulin-folding cofactor B	0.906	0.0342	1	1	53	0.0066	38.0
MSN	moesin	0.906	0.0344	5	3	269	1.53E-07	8.7
ARCN1	coatomer subunit delta	0.905	0.0345	1	1	56	0.0058	7.8
YWHAE	14-3-3 protein epsilon	0.905	0.0347	3	3	212	1.96E-05	3.9
DHFR	dihydrofolate reductase (EC 1.5.1.3)	0.904	0.0350	2	2	108	3.01E-06	3.8
PNP	Purine nucleoside phosphorylase	0.903	0.0356	2	2	131	0.0005	3.6
CSTB	cystatin-B-like	0.903	0.0358	1	1	41	0.0004	4.8
NAGLU	alpha-N-acetylglucosaminidase-like	0.903	0.0358	1	1	49	1.66E-06	9.0
RDX	radixin	0.903	0.0359	3	1	159	3.22E-05	11.5
PRKCSH	Glucosidase 2 subunit beta	0.902	0.0361	1	1	60	0.0014	6.1
NCL	nucleolin	0.902	0.0364	5	5	268	5.65E-06	2.7
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	0.901	0.0369	1	1	57	0.0082	17.1
MYL6	Myosin light polypeptide 6	0.900	0.0372	1	1	61	3.04E-05	24.7
Akr1b1	aldose reductase-like	0.900	0.0376	2	1	122	0.0001	34.8
YWHAZ	14-3-3 protein zeta/delta-like	0.898	0.0386	1	1	73	1.52E-05	7.2
TKTL1	transketolase-like	0.896	0.0398	6	6	285	0.0001	5.7
TPM3	tropomyosin alpha-3 chain isoform 1	0.895	0.0401	1	1	60	0.0001	4.1

TXNDC5	thioredoxin domain-containing protein 5	0.894	0.0407	2	2	96	5.63E-06	9.4
ECT2L	Epithelial cell transforming sequence 2 oncogene-like	0.892	0.0417	1	1	70	0.0053	13.8
ADH5	alcohol dehydrogenase class-3-like	0.891	0.0425	1	1	64	0.0030	121.7
Hsc70-4	heat shock 70 kDa protein 4-like	0.890	0.0430	4	3	253	0.0002	3.6
ALYREF	THO complex subunit 4	0.889	0.0434	1	1	60	0.0002	4.8
RPS18	40S ribosomal protein S18	0.889	0.0435	2	2	103	0.0003	3.5
G3BP1	ras GTPase-activating protein-binding protein 1	0.889	0.0437	1	1	62	0.0001	4.5
ANXA5	annexin A5-like	0.888	0.0444	2	2	115	1.17E-07	7.6
ADSL	Adenylosuccinate lyase	0.887	0.0446	1	1	48	0.0002	6.6
N/A	Lamin-L(I)	0.886	0.0454	1	1	55	0.0001	4.4
MOB4	Mps one binder kinase activator-like 3	0.886	0.0454	1	1	84	3.74E-05	3.6
GOT1	aspartate aminotransferase, cytoplasmic	0.885	0.0462	1	1	44	0.0011	4.4
FERMT2	Fermitin family-like 2	0.885	0.0463	1	1	45	0.0380	67.6
RPL5	60S ribosomal protein L5	0.884	0.0466	1	1	45	0.0061	7.0
EIF5A	Eukaryotic translation initiation factor 5A-1	0.882	0.0478	1	1	116	0.0005	3.2
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	0.880	0.0489	2	2	124	0.0009	3.3
PGK1	phosphoglycerate kinase 1	0.879	0.0497	2	2	92	0.0002	2.8
PHGDH	d-3-phosphoglycerate dehydrogenase-like	0.879	0.0497	1	1	63	0.0137	36.4

Table 3.3.17: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 31˚C culture. The list below displays host cell proteins that were found to correlate positively (increase in expression) with time in a DP12 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold
HNRNPA3	Heterogeneous nuclear ribonucleoprotein D0	0.999	2.39E-05	2	2	106	2.75E-05	7.4
DDX1	ATP-dependent RNA helicase DDX1	0.998	0.0001	1	1	42	0.0011	45.3
GCLM	Glutathione S-transferase A4	0.997	0.0002	2	1	88	3.63E-06	15.1
ADSL	Adenylosuccinate lyase	0.996	0.0003	3	3	147	0.0002	15.3
DDX39B	Spliceosome RNA helicase BAT1	0.995	0.0004	2	2	124	8.95E-07	7.9
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	0.994	0.0005	1	1	73	0.0154	70.0
PFDN1	Prefoldin subunit 1	0.994	0.0005	1	1	59	0.0002	15.8
KPNB1	Importin-5	0.994	0.0006	3	3	222	3.43E-06	6.3
ARCN1	coiled-coil domain-containing protein 80-like	0.994	0.0006	4	4	223	3.87E-05	5.3
SYNCRIP	Heterogeneous nuclear ribonucleoprotein U	0.993	0.0007	1	1	72	9.19E-07	8.5
NAGLU	alpha-N-acetylglucosaminidase-like	0.993	0.0007	4	4	270	1.89E-09	15.8
WDR1	WD repeat-containing protein 1	0.993	0.0007	2	2	121	4.01E-07	6.2
CCDC8	Cold-inducible RNA-binding protein	0.992	0.0008	2	2	95	1.65E-07	35.0
VCL	Vinculin	0.992	0.0009	4	4	231	7.33E-06	6.9
ILF2	Isocitrate dehydrogenase	0.991	0.0010	4	4	222	8.25E-06	10.0
PPP2R2A	Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	0.991	0.0010	2	2	139	2.16E-05	5.6
AHCY	Adenosylhomocysteinase	0.991	0.0011	3	3	227	4.18E-08	11.7
GAPDH	Glycyl-tRNA synthetase	0.991	0.0011	1	1	55	0.0006	4.1
TPM4	Tropomyosin alpha-4 chain	0.991	0.0011	3	3	191	3.27E-07	30.3
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.990	0.0011	1	1	52	0.0007	15.8
HMOX1	Heme-binding protein 1	0.990	0.0012	1	1	44	1.98E-06	11.5
UBA1	Ubiquitin-like modifier-activating enzyme 1	0.990	0.0013	5	5	312	1.36E-05	9.3
UGDH	UDP-glucose 6-dehydrogenase	0.989	0.0014	3	3	232	1.08E-06	5.6
Cycs	Cytosolic non-specific dipeptidase	0.989	0.0014	1	1	41	0.0016	4.5
COPS4	Coronin-1B	0.989	0.0014	1	1	56	3.54E-09	11.9

OSTF1	Osteoclast-stimulating factor 1	0.989	0.0015	1	1	71	3.28E-09	21.9
TPM3	Tropomyosin alpha-3 chain	0.989	0.0015	2	2	97	6.10E-06	23.3
PIR	Pirin	0.988	0.0016	1	1	73	2.77E-05	5.9
ANXA5	Annexin A5	0.988	0.0016	3	3	168	4.41E-07	7.0
KHSRP	Farnesyl pyrophosphate synthase	0.988	0.0016	1	1	54	1.29E-05	6.7
ANXA2	Annexin A2	0.988	0.0017	2	2	103	2.18E-08	16.2
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	0.987	0.0017	1	1	63	0.0002	12.7
PTBP1	Polypyrimidine tract-binding protein 1	0.987	0.0017	2	2	103	2.92E-06	7.1
HNRNPU	Heterogeneous nuclear ribonucleoproteins A2/B1	0.987	0.0018	3	3	215	1.66E-09	27.0
RANBP2	E3 ubiquitin-protein ligase NEDD4	0.987	0.0018	1	1	45	0.0247	2.2
RPL12	60S ribosomal protein L12	0.986	0.0019	1	1	56	4.04E-07	8.3
RPS15A	40S ribosomal protein S15a	0.986	0.0020	2	2	96	9.04E-09	6.4
SF3A1	Splicing factor 3A subunit 1	0.986	0.0020	2	2	100	2.95E-05	21.0
PLS3	Plastin-3	0.985	0.0021	2	2	167	1.23E-05	6.9
CTSB	Cathepsin D	0.985	0.0022	4	4	202	7.40E-08	5.7
AHNAK	Neuroblast differentiation-associated protein AHNAK	0.985	0.0023	2	2	98	3.54E-06	4.7
EZR	F-actin-capping protein subunit alpha-1	0.985	0.0023	1	1	77	0.0175	7.7
TSN	Translin	0.984	0.0024	1	1	60	8.61E-11	27.7
LXN	Leukocyte elastase inhibitor A	0.984	0.0024	4	4	297	3.84E-08	10.5
EIF4A1	Eukaryotic translation initiation factor 1	0.984	0.0024	1	1	76	1.52E-05	4.2
KARS	Lysyl-tRNA synthetase	0.984	0.0024	1	1	42	5.52E-06	8.3
OLA1	Obg-like ATPase 1	0.984	0.0024	2	2	112	2.56E-08	10.6
SERPINB1	LIM and SH3 domain protein 1	0.983	0.0026	4	3	211	0.0001	3.2
SERPINB6	Serpin B6	0.983	0.0026	1	1	78	7.47E-07	8.7
FAH	Galectin-3	0.983	0.0026	2	2	115	2.17E-06	6.0
GSTA4	Glutathione S-transferase alpha-3	0.983	0.0027	2	1	103	1.48E-05	6.5
Testin-2	Testin-2	0.983	0.0027	1	1	62	0.0001	18.2
EIF2S1	Eukaryotic translation initiation factor 2 subunit 3	0.983	0.0027	1	1	49	4.78E-07	12.0
G3BP2	Ras GTPase-activating protein-binding protein 2	0.982	0.0029	1	1	45	2.49E-05	4.6
PGD	6-phosphogluconate dehydrogenase, decarboxylating	0.982	0.0029	3	3	182	3.24E-07	10.9
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins C1/C2	0.982	0.0029	3	3	153	3.51E-05	4.9
PGK1	Phosphoglycerate kinase 1	0.982	0.0029	3	3	189	0.0002	5.0
Gsta3	Glutathione S-transferase Mu 5	0.982	0.0029	4	3	243	1.70E-06	15.3

DHX9	ATP-dependent RNA helicase A	0.982	0.0030	5	5	326	2.78E-09	60.9
LMNB1	Latexin	0.982	0.0030	1	1	82	6.23E-07	21.1
ACAT2	Acetyl-CoA acetyltransferase, cytosolic	0.981	0.0030	1	1	50	2.26E-06	12.4
HNRNPC	high mobility group nucleosome-binding domain-containing protein 5-like	0.981	0.0031	1	1	66	1.92E-05	31.2
SEC31A	Protein transport protein Sec31A	0.981	0.0031	1	1	68	3.06E-06	8.4
CORO1B	Cullin-associated NEDD8-dissociated protein 1	0.981	0.0031	3	3	196	2.00E-05	5.7
DHFR	Disintegrin and metalloproteinase domain-containing protein 10	0.981	0.0031	1	1	44	7.31E-06	15.0
S100A13	Protein S100-A13	0.981	0.0032	1	1	53	8.33E-08	24.1
EEF1D	Elongation factor 1-gamma	0.981	0.0032	6	6	309	4.86E-08	9.4
C3	COP9 signalosome complex subunit 4	0.981	0.0032	1	1	93	7.98E-09	37.5
RPS3A	40S ribosomal protein S3a	0.981	0.0032	1	1	75	2.06E-06	9.6
RPS28	40S ribosomal protein S28	0.980	0.0033	1	1	53	1.59E-05	8.5
ANXA8	Annexin A8	0.980	0.0033	1	1	42	0.0042	89.9
ATIC	Biliverdin reductase A	0.980	0.0033	1	1	87	6.43E-07	9.0
TCP1	T-complex protein 1 subunit alpha	0.980	0.0035	1	1	40	0.0001	20.7
API5	Apoptosis inhibitor 5	0.980	0.0035	1	1	46	0.0003	5.1
RPL18	60S ribosomal protein L18	0.980	0.0035	1	1	49	2.30E-06	17.8
MFGE8	Lactoylglutathione lyase	0.980	0.0035	1	1	50	0.0002	12.1
SNRPE	Small nuclear ribonucleoprotein E	0.979	0.0035	1	1	58	1.42E-06	6.6
CNDP2	d-3-phosphoglycerate dehydrogenase-like	0.979	0.0035	3	3	177	8.03E-09	12.6
ADM	ADM	0.979	0.0036	1	1	49	4.25E-06	7.8
VCP	Transitional endoplasmic reticulum ATPase	0.979	0.0036	7	7	410	2.54E-07	10.6
RPS14	40S ribosomal protein S14	0.979	0.0036	1	1	52	1.22E-06	145.4
ATXN10	Ataxin-10	0.979	0.0036	1	1	89	9.76E-06	14.6
PITPNA	Phosphatidylinositol transfer protein alpha isoform	0.979	0.0037	1	1	60	0.0002	4.7
PEBP1	Phosphatidylethanolamine-binding protein 1	0.979	0.0037	1	1	69	1.46E-05	3.3
QSOX1	Sulfhydryl oxidase 1	0.978	0.0038	2	2	98	2.10E-09	9.1
LPL	L-lactate dehydrogenase A chain	0.978	0.0038	5	5	306	3.66E-10	39.6
PSMD4	26S proteasome non-ATPase regulatory subunit 4	0.978	0.0039	1	1	68	0.0001	8.4
CTSL1	Cathepsin Z	0.978	0.0039	1	1	51	3.78E-08	13.0
RNH1	ribonuclease inhibitor-like	0.978	0.0040	1	1	67	8.78E-07	6.6
TAGLN2	Transgelin-2	0.978	0.0040	4	4	227	1.54E-05	6.6

SRM	Spermidine synthase	0.978	0.0040	1	1	58	2.11E-07	138.4
PPCS	phosphopantothenate--cysteine ligase-like	0.977	0.0041	2	2	88	0.0001	46.2
GOT1	Aspartate aminotransferase, cytoplasmic	0.977	0.0041	5	5	297	7.54E-07	14.8
VIM	Vimentin	0.977	0.0041	10	10	530	1.38E-10	20.8
RPS21	40S ribosomal protein S21	0.977	0.0041	3	3	192	1.92E-05	9.7
PSME1	Proteasome activator complex subunit 1	0.977	0.0042	5	5	276	1.59E-07	5.5
HMGCS1	Hypoxanthine-guanine phosphoribosyltransferase	0.977	0.0042	1	1	72	4.82E-05	7.4
ITIH5	Interleukin enhancer-binding factor 2	0.977	0.0042	2	2	121	2.35E-07	11.9
FABP4	Fermitin family-like 2	0.977	0.0042	1	1	71	0.0002	4.5
YWHAB	14-3-3 protein beta/alpha	0.977	0.0042	4	1	195	1.81E-07	28.4
GSTP1	glutathione synthetase-like	0.977	0.0042	6	6	361	0.0001	4.6
CAPRIN1	Carbonyl reductase	0.977	0.0043	4	4	216	3.56E-07	8.1
AKR1A1	Alcohol dehydrogenase (NADP+)	0.976	0.0044	3	2	164	5.93E-07	15.4
CAPZB	Far upstream element-binding protein 2	0.976	0.0044	1	1	45	0.0231	32.4
AK2	Adenylate kinase 2, mitochondrial	0.976	0.0044	2	2	104	1.18E-06	28.9
TXN	Thioredoxin	0.976	0.0044	1	1	57	0.0011	3.3
NCL	Nucleolin	0.976	0.0044	4	4	198	7.57E-06	4.4
RPS18	40S ribosomal protein S18	0.975	0.0046	5	5	265	1.25E-06	8.8
YWHAE	14-3-3 protein epsilon	0.975	0.0047	10	8	481	3.33E-06	4.7
YWHAG	14-3-3 protein gamma	0.975	0.0048	5	2	228	5.13E-06	21.1
EEF1B2	Elongation factor 1-delta	0.975	0.0048	2	2	115	6.30E-09	10.2
GRN	GTP-binding nuclear protein Ran	0.975	0.0048	2	2	84	0.0020	80.6
PNP	Purine nucleoside phosphorylase	0.975	0.0048	3	3	185	1.91E-05	5.0
ADH5	Alcohol dehydrogenase class-3	0.975	0.0049	2	2	155	3.23E-09	10.2
GPI	Glutamate--cysteine ligase regulatory subunit	0.974	0.0049	1	1	75	0.0001	6.3
RPLP0	60S acidic ribosomal protein P0	0.974	0.0049	2	1	141	4.14E-05	4.5
RPS26	40S ribosomal protein S26	0.974	0.0049	1	1	59	0.0001	3.5
CBR1	Catalase	0.974	0.0050	3	2	160	4.10E-05	29.7
CAPG	Macrophage-capping protein	0.974	0.0051	4	4	297	0.0001	4.3
HSPA4	Heat shock cognate 71 kDa protein	0.974	0.0051	4	3	215	0.0001	3.0
YWHAZ	14-3-3 protein zeta/delta	0.974	0.0052	4	2	346	9.37E-06	11.4
PFN1	Profilin-1	0.973	0.0052	1	1	56	0.0009	3.6
GALM	Aldose 1-epimerase	0.973	0.0052	1	1	42	0.0001	9.7

THBD	thrombomodulin-like	0.973	0.0052	1	1	61	0.0003	3.5
IQGAP1	Ras GTPase-activating-like protein IQGAP1	0.973	0.0052	3	3	162	1.47E-05	4.6
PHGDH	D-dopachrome decarboxylase	0.973	0.0053	1	1	42	1.73E-05	8.0
PSMD6	26S proteasome non-ATPase regulatory subunit 6	0.973	0.0053	1	1	79	1.55E-05	9.1
SERBP1	plasminogen activator inhibitor 1 RNA-binding protein-like	0.973	0.0054	2	2	93	2.59E-05	25.7
NSFL1C	NSFL1 cofactor p47	0.973	0.0054	3	3	152	4.53E-05	6.6
BLVRA	C-1-tetrahydrofolate synthase, cytoplasmic	0.973	0.0054	3	3	237	4.36E-06	5.4
APRT	Adenine phosphoribosyltransferase	0.973	0.0054	2	2	108	2.63E-09	16.7
FUCA1	Tissue alpha-L-fucosidase	0.972	0.0055	2	2	137	1.74E-06	2.7
RBBP4	Hsc70-interacting protein	0.972	0.0055	1	1	63	4.23E-06	12.4
GANAB	Neutral alpha-glucosidase AB	0.972	0.0055	1	1	49	2.24E-09	7.8
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	0.972	0.0055	1	1	43	8.49E-09	10.7
RPS6	40S ribosomal protein S6	0.972	0.0056	1	1	47	0.0001	13.3
PMS1	PMS1 protein-like 1	0.972	0.0056	1	1	41	1.43E-05	6.0
PPM1G	Protein phosphatase 1G	0.972	0.0056	3	3	165	0.0001	5.7
ATF6	Cysteine and glycine-rich protein 1	0.972	0.0057	1	1	61	7.87E-09	53.2
PKM	Pyruvate kinase isozymes M1/M2	0.972	0.0057	10	10	582	0.0001	3.8
ST13	Hsp90 co-chaperone Cdc37	0.972	0.0057	2	2	123	4.30E-06	5.2
RBM8A	RNA-binding protein 8A	0.971	0.0058	2	2	114	3.46E-06	6.0
RAN	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	0.971	0.0058	1	1	50	1.15E-05	48.3
HNRNPL	Heterogeneous nuclear ribonucleoprotein Q	0.971	0.0058	5	5	304	1.04E-05	3.4
HSPE1	10 kDa heat shock protein, mitochondrial	0.971	0.0058	2	2	115	5.10E-06	8.1
NAP1L1	Nucleosome assembly protein 1-like 1	0.971	0.0058	1	1	61	0.0001	4.2
EEF1A1	Elongation factor 1-beta	0.971	0.0058	1	1	77	3.51E-05	3.4
LMNA	Prelamin-A/C	0.971	0.0059	8	7	526	2.86E-07	10.6
GDI2	Rab GDP dissociation inhibitor beta	0.970	0.0061	2	2	86	1.18E-06	6.5
LUC7L	Putative RNA-binding protein Luc7-like 2	0.970	0.0061	1	1	73	6.68E-06	8.8
MSN	Moesin	0.970	0.0062	11	8	611	8.65E-08	13.2
GARS	granulins isoform 1	0.970	0.0062	1	1	52	0.0012	8.4
NUDC	Nuclear migration protein nudC	0.970	0.0063	1	1	59	8.85E-06	7.6
RPS17	40S ribosomal protein S17	0.970	0.0063	1	1	58	2.72E-05	10.0
ACTN4	Alpha-actinin-4_DUP2	0.970	0.0064	2	1	148	1.60E-06	6.6
GNS	N-acetylglucosamine-6-sulfatase	0.969	0.0064	3	3	155	5.42E-07	6.2

IPO5	Inositol monophosphatase 1	0.969	0.0064	1	1	53	8.55E-06	11.0
CMPK1	UMP-CMP kinase	0.969	0.0064	1	1	56	0.0002	11.9
PARK7	Protein DJ-1	0.969	0.0065	1	1	53	3.14E-05	9.1
CSE1L	extracellular sulfatase Sulf-2	0.969	0.0065	5	5	235	4.81E-09	3.2
NUCB2	Nucleobindin-2	0.969	0.0065	5	4	301	4.31E-06	4.1
USP5	Ubiquitin carboxyl-terminal hydrolase 5	0.969	0.0065	2	2	111	0.0014	5.5
EIF4B	Eukaryotic translation initiation factor 5A-2	0.969	0.0065	1	1	70	7.31E-06	4.1
ENO1	Alpha-enolase	0.969	0.0066	1	1	41	2.03E-07	21.0
RANBP1	Ran-specific GTPase-activating protein	0.969	0.0066	1	1	54	0.0012	95.7
ARHGDIA	Rho GDP-dissociation inhibitor 1	0.969	0.0066	1	1	57	2.82E-06	7.6
YWHAH	14-3-3 protein eta	0.969	0.0067	5	1	235	3.43E-05	13.6
PDIA6	Protein disulfide-isomerase A6	0.968	0.0067	7	7	480	2.01E-08	10.6
CLU	Coatomer subunit beta	0.968	0.0067	1	1	45	0.0011	7.0
TFPI	tissue factor pathway inhibitor-like	0.968	0.0068	1	1	48	1.09E-08	20.5
S100A6	Protein S100-A6	0.968	0.0068	1	1	40	5.34E-07	32.9
TPI1	Triosephosphate isomerase	0.968	0.0069	1	1	84	3.57E-07	6.5
ANXA1	Annexin A1	0.968	0.0070	3	3	158	7.35E-07	9.5
FDPS	Fatty acid-binding protein, adipocyte	0.967	0.0070	2	2	167	3.39E-05	14.4
CLIC1	Chloride intracellular channel protein 4	0.967	0.0070	1	1	57	3.99E-06	9.7
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A1	0.967	0.0071	1	1	44	6.90E-07	9.0
CTSZ	CD2 antigen cytoplasmic tail-binding protein 2-like	0.967	0.0072	1	1	48	1.08E-06	5.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	0.967	0.0072	1	1	78	0.0001	31.8
GNB1	Guanine nucleotide-binding protein subunit beta-2-like 1	0.967	0.0072	2	2	137	1.67E-06	4.0
VAT1	Synaptic vesicle membrane protein VAT-1-like	0.966	0.0073	4	4	192	1.28E-08	27.0
PSMB7	Proteasome subunit beta type-7	0.966	0.0074	2	2	92	0.0010	220.6
HMGB1	High mobility group protein B2	0.966	0.0074	1	1	41	2.16E-06	36.0
PTGR1	Prostaglandin reductase 1	0.966	0.0075	3	2	155	0.0002	3.6
SARNP	SAP domain-containing ribonucleoprotein	0.966	0.0076	1	1	63	0.0011	94.7
Ctla2b	protein CTLA-2-beta-like	0.966	0.0076	1	1	50	7.80E-06	5.6
PGAM1	Phosphoglycerate mutase 1	0.966	0.0076	2	2	150	0.0002	5.0
SCPEP1	Retinoid-inducible serine carboxypeptidase	0.966	0.0076	1	1	53	4.98E-05	3.2
SERPINH1	Serpin H1	0.966	0.0076	4	4	200	3.04E-07	8.2
ACTG1	Actin, cytoplasmic 2	0.966	0.0076	4	4	212	6.27E-06	5.6

AKR1B1	Aldose reductase	0.966	0.0076	4	2	224	1.87E-05	8.3
MYL6	Myosin light polypeptide 6	0.966	0.0076	1	1	61	5.48E-06	24.4
USO1	Glucose-6-phosphate 1-dehydrogenase	0.965	0.0077	1	1	51	0.0023	9.2
G6PD	Glucose-6-phosphate isomerase	0.965	0.0077	2	2	107	2.47E-07	5.4
RPS12	40S ribosomal protein S12	0.965	0.0077	1	1	47	4.51E-07	22.6
HNRNPK	Heterogeneous nuclear ribonucleoprotein L	0.965	0.0078	2	2	98	4.04E-06	33.9
PDIA3	Protein disulfide-isomerase A3	0.965	0.0079	7	7	412	2.35E-08	20.9
PDIA4	Protein disulfide-isomerase A4	0.964	0.0080	5	5	301	7.11E-07	9.9
HSPA13	Heat shock 70 kDa protein 4	0.964	0.0080	7	7	436	6.59E-07	4.5
TALDO1	Transaldolase	0.964	0.0081	4	4	285	5.96E-07	10.4
FTH1	Flavin reductase	0.964	0.0081	3	3	145	1.02E-06	11.5
TCEB2	Transcription elongation factor B polypeptide 2	0.964	0.0082	1	1	46	4.02E-05	34.7
CD2BP2	Chloride intracellular channel protein 1	0.964	0.0083	2	2	100	9.85E-06	27.2
DDT	Ddx5-004	0.964	0.0083	1	1	47	4.90E-06	8.0
VPS35	Vacuolar protein sorting-associated protein 35	0.964	0.0083	1	1	59	4.75E-05	10.5
VAPA	Vesicle-associated membrane protein-associated protein A	0.963	0.0083	2	2	129	0.0021	19.3
P15156	Calponin-2	0.963	0.0084	1	1	58	7.42E-06	57.8
TXNDC5	Thioredoxin domain-containing protein 5	0.963	0.0085	2	2	106	9.46E-06	12.2
THBS3	thrombospondin-3	0.963	0.0085	1	1	49	0.0042	1.8
H3F3A	Histone-binding protein RBBP4	0.963	0.0086	1	1	52	0.0007	6.7
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	0.963	0.0086	1	1	57	0.0001	8.5
PRDX6	Peroxiredoxin-6	0.963	0.0086	1	1	45	8.31E-06	6.3
UGP2	UTP--glucose-1-phosphate uridylyltransferase	0.962	0.0089	1	1	57	0.0010	8.4
SF3B2	Splicing factor 3B subunit 2	0.962	0.0089	1	1	43	0.0005	10.1
PPIB	Peptidyl-prolyl cis-trans isomerase B	0.962	0.0090	1	1	54	1.37E-06	5.6
SDF4	45 kDa calcium-binding protein	0.962	0.0090	3	3	185	0.0013	2.1
GSS	Glyceraldehyde-3-phosphate dehydrogenase	0.961	0.0090	1	1	61	1.70E-06	16.4
SF3B3	Splicing factor 3B subunit 3	0.961	0.0091	2	2	89	0.0001	6.8
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	0.961	0.0091	1	1	42	0.0044	5.3
TPT1	Translationally-controlled tumor protein	0.961	0.0092	1	1	52	9.14E-07	16.4
ESD	S-formylglutathione hydrolase	0.961	0.0093	1	1	45	3.74E-05	9.5
GSTM5	Glutathione S-transferase P	0.960	0.0094	2	2	93	1.44E-05	5.9
EWSR1	RNA-binding protein EWS	0.960	0.0094	1	1	59	1.26E-05	14.0

PPIA	Peptidyl-prolyl cis-trans isomerase A	0.960	0.0094	2	2	105	1.22E-06	13.7
MDH1	Malate dehydrogenase, cytoplasmic	0.960	0.0095	3	3	164	9.45E-07	10.2
HMGN5	High mobility group protein B1	0.960	0.0095	1	1	43	0.0006	110.0
CAPZA1	F-actin-capping protein subunit beta	0.960	0.0095	3	3	194	1.74E-07	8.2
RPL8	60S ribosomal protein L8	0.960	0.0095	1	1	40	0.0009	141.3
PRDX2	Peroxiredoxin-2	0.960	0.0096	1	1	45	1.98E-06	5.2
HSP90B1	Eukaryotic initiation factor 4A-I	0.959	0.0097	2	2	140	6.39E-06	3.2
C11orf68	UPF0696 protein C11orf68 homolog	0.959	0.0098	1	1	67	1.23E-06	15.2
EIF1	Eukaryotic translation initiation factor 2 subunit 1	0.959	0.0098	1	1	91	1.46E-06	9.4
CIRBP	Collagen alpha-1(III) chain	0.959	0.0098	1	1	85	0.0009	15.4
PGM2	Phosphoglucomutase-2	0.959	0.0099	1	1	81	2.18E-05	8.1
MAP4	microtubule-associated protein 4	0.959	0.0100	1	1	61	3.94E-07	14.6
EIF3J	Eukaryotic translation initiation factor 4B	0.959	0.0100	2	2	120	1.53E-07	9.0
TKT	Transketolase	0.959	0.0100	8	8	415	1.56E-07	18.1
ACTN1	Alpha-actinin-1	0.959	0.0100	6	3	407	0.0001	3.5
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A3	0.958	0.0101	1	1	59	4.07E-10	174.0
ASAH1	Acid ceramidase	0.958	0.0102	4	4	186	0.0001	4.9
P4hb	Protein disulfide-isomerase	0.958	0.0103	3	3	144	7.09E-07	10.1
SH3BGRL3	SH3 domain-binding glutamic acid-rich-like protein 3	0.958	0.0104	1	1	58	1.07E-06	39.8
NAP1L4	Nucleosome assembly protein 1-like 4	0.957	0.0105	1	1	58	0.0003	35.1
DDX3X	ATP-dependent RNA helicase DDX3X	0.957	0.0105	1	1	47	3.78E-07	19.5
RPLP2	60S acidic ribosomal protein P2	0.957	0.0105	1	1	72	0.0001	19.3
PLA2G7	platelet-activating factor acetylhydrolase-like	0.957	0.0106	2	1	130	0.0001	5.1
CNN2	Calreticulin	0.957	0.0106	5	5	263	2.85E-07	7.5
DCN	Destrin	0.957	0.0108	3	3	179	3.82E-07	4.1
RPL29	60S ribosomal protein L29	0.956	0.0108	1	1	61	0.0013	140.9
HSPG2	Bifunctional purine biosynthesis protein PURH	0.956	0.0109	1	1	42	6.02E-06	13.4
SEC22B	Vesicle-trafficking protein SEC22b	0.956	0.0109	2	2	117	4.09E-07	117.2
TXNRD1	Thioredoxin reductase 1, cytoplasmic	0.956	0.0109	3	3	181	4.03E-06	5.4
PSMB6	Proteasome subunit beta type-6	0.956	0.0109	3	3	198	9.32E-06	13.4
PCBP1	Poly(rC)-binding protein 1	0.956	0.0110	1	1	55	1.80E-08	59.2
SFPQ	Splicing factor, proline- and glutamine-rich	0.956	0.0111	3	2	169	1.49E-05	4.9
GLO1	Lamin-B1	0.956	0.0112	1	1	59	0.0001	13.8

ALYREF	THO complex subunit 4	0.955	0.0112	1	1	62	0.0002	4.9
ACTN4	Alpha-actinin-4	0.955	0.0113	3	1	200	3.32E-06	52.1
HSPA8	heat shock protein HSP 90-beta-like	0.955	0.0113	6	5	361	3.87E-06	3.4
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	0.955	0.0114	1	1	53	0.0014	6.5
RPS9	40S ribosomal protein S9	0.955	0.0116	1	1	40	6.25E-06	4.7
YBX1	Nuclease-sensitive element-binding protein 1	0.954	0.0116	1	1	72	3.36E-05	5.2
SEPT9	Septin-9	0.954	0.0117	1	1	52	4.16E-06	16.7
RAB7A	ras-related protein Rab-7a-like	0.954	0.0119	1	1	55	0.0066	116.0
TRAIP	TRIP protein	0.954	0.0119	2	1	102	2.28E-06	11.3
NUCB1	Nucleobindin-1	0.953	0.0120	3	2	157	2.76E-06	3.1
PA2G4	Proliferation-associated protein 2G4	0.953	0.0120	4	4	254	0.0004	2.9
ATP6AP2	Renin receptor	0.953	0.0121	2	2	101	2.15E-06	9.5
PSME2	proteasome activator complex subunit 2-like isoform 1	0.953	0.0121	1	1	92	9.19E-06	3.6
SERPINF1	Pigment epithelium-derived factor	0.952	0.0124	1	1	41	4.93E-05	3.1
COPB1	Coatomer subunit delta	0.952	0.0125	1	1	52	2.70E-07	30.2
CLSTN1	Calumenin	0.952	0.0125	2	2	101	0.0001	81.8
RPS3	40S ribosomal protein S3	0.951	0.0128	3	3	229	2.45E-09	5.7
BLVRB	Fructose-bisphosphate aldolase A	0.951	0.0128	3	3	149	0.0047	150.0
CTSA	Lysosomal protective protein	0.950	0.0135	3	3	131	5.92E-07	4.3
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	0.949	0.0136	3	3	130	5.93E-07	14.7
NONO	Non-POU domain-containing octamer-binding protein	0.949	0.0136	4	3	210	3.50E-06	6.2
SET	Protein SET	0.949	0.0137	2	2	102	6.09E-07	31.7
NEU1	Sialidase-1	0.949	0.0137	1	1	68	0.0130	524.4
STIP1	Stress-induced-phosphoprotein 1	0.949	0.0137	2	2	88	8.25E-06	9.6
PSMA2	Proteasome subunit alpha type-2	0.949	0.0139	1	1	49	1.41E-05	17.8
PSMB2	Proteasome subunit beta type-2	0.949	0.0139	1	1	72	1.70E-07	51.6
RPL19	60S ribosomal protein L19	0.948	0.0140	1	1	54	0.0014	70.4
ALDOA	Fumarylacetoacetase	0.948	0.0141	3	3	165	0.0004	13.4
HIST1H2AG	Histone H3.3	0.948	0.0142	1	1	88	9.34E-08	14.0
RPL3	60S ribosomal protein L3	0.947	0.0144	1	1	50	7.14E-09	9.9
RPS5	40S ribosomal protein S5	0.947	0.0146	1	1	65	6.14E-08	52.8

OLFML1	Olfactomedin-like protein 3	0.947	0.0146	2	2	99	0.0003	3.7
DYNLL2	E3 SUMO-protein ligase RanBP2	0.946	0.0148	1	1	43	6.39E-14	Infinity
COL3A1	Collagen alpha-1(V) chain	0.946	0.0150	1	1	47	1.88E-07	3.9
RPS20	40S ribosomal protein S20	0.946	0.0150	1	1	52	3.71E-07	12.7
SULF2	Ezrin	0.946	0.0151	5	2	290	1.67E-05	2.5
PLEC	Plectin	0.946	0.0151	1	1	55	2.77E-06	13.8
RAD23B	UV excision repair protein RAD23 homolog B	0.945	0.0152	3	3	182	0.0001	5.1
PSMC1	26S protease regulatory subunit 4	0.945	0.0152	1	1	79	0.0002	8.6
PSMA6	Proteasome subunit alpha type-6	0.945	0.0153	2	2	101	6.45E-06	5.0
PLBD2	Putative phospholipase B-like 2	0.945	0.0153	3	3	138	3.42E-07	2.3
HEBP1	Hepatoma-derived growth factor	0.944	0.0156	1	1	66	0.0016	182.9
HPRT1	Importin subunit beta-1	0.944	0.0159	3	3	215	1.23E-06	5.2
CIAPIN1	Anamorsin	0.943	0.0162	1	1	46	1.15E-06	7.1
CCT2	T-complex protein 1 subunit beta	0.943	0.0163	3	3	150	0.0005	4.3
FAM3C	Protein FAM3C	0.942	0.0165	2	2	146	2.64E-05	3.9
RPL28	60S ribosomal protein L28	0.942	0.0165	1	1	44	1.26E-07	8.0
HNRNPF	Heterogeneous nuclear ribonucleoprotein G	0.942	0.0166	2	2	148	4.08E-05	2.8
PRDX1	Peroxiredoxin-1	0.942	0.0168	2	2	83	2.25E-07	9.6
ATP6AP1	V-type proton ATPase subunit S1	0.941	0.0170	2	2	124	0.0001	2.6
RPS16	40S ribosomal protein S16	0.941	0.0171	1	1	51	0.0008	7.9
NPPA	Atrial natriuretic factor	0.941	0.0171	3	3	180	0.0003	5.1
ADAM10	Disintegrin and metalloproteinase domain-containing protein 17	0.940	0.0173	1	1	54	9.25E-06	4.4
EIF2S3	Eukaryotic translation initiation factor 3 subunit G	0.940	0.0173	2	2	108	1.04E-05	14.8
HSPA5	78 kDa glucose-regulated protein	0.940	0.0176	7	7	494	1.76E-07	25.2
CAT	Cathepsin B	0.940	0.0176	3	3	148	1.10E-05	2.0
PSMA3	Proteasome subunit alpha type-3	0.939	0.0178	1	1	86	2.12E-05	10.8
TIMP2	Metalloproteinase inhibitor 2	0.939	0.0180	1	1	41	0.0058	4.1
Cald1	Non-muscle caldesmon	0.939	0.0181	3	3	138	4.07E-05	6.0
CALR	Calsyntenin-1	0.938	0.0184	4	2	237	5.34E-06	3.3
GNB2L1	Heat shock 70 kDa protein 13	0.938	0.0184	10	10	552	4.68E-08	2.5
CLIC4	Clusterin	0.938	0.0185	3	3	149	0.0004	3.2
AARS	Alanyl-tRNA synthetase, cytoplasmic	0.938	0.0185	3	3	208	1.50E-06	12.0
DSTN	Dihydrofolate reductase	0.937	0.0189	1	1	42	0.0113	56.9

RPL23	60S ribosomal protein L23	0.937	0.0190	1	1	42	2.09E-05	593.8
NPM1	Nucleophosmin	0.936	0.0191	1	1	59	1.23E-05	1804.6
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	0.936	0.0191	1	1	46	0.0007	6.8
RPSA	40S ribosomal protein SA	0.936	0.0192	1	1	46	2.26E-06	10.5
DBI	Acyl-CoA-binding protein	0.936	0.0192	1	1	42	0.0157	3.1
PGM1	Phosphoglucomutase-1	0.936	0.0193	1	1	73	4.41E-05	319.0
TES	Testin	0.936	0.0194	1	1	51	1.74E-07	11.6
EIF5A2	Exostosin-2	0.936	0.0194	1	1	60	0.0001	2.1
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	0.936	0.0195	1	1	51	0.0001	4.2
IDH1	Lactadherin	0.935	0.0195	3	3	168	0.0038	11.3
EIF3I	Eukaryotic translation initiation factor 3 subunit J	0.935	0.0195	1	1	70	2.42E-07	13.9
FERMT2	Ferritin heavy chain	0.935	0.0197	3	3	192	2.43E-11	30.7
PRMT1	Protein arginine N-methyltransferase 1	0.935	0.0198	2	2	119	2.77E-06	5.2
HMGB2	Histone H2A type 1	0.934	0.0203	2	2	134	5.51E-08	11.1
FBL	rRNA 2'-O-methyltransferase fibrillarin	0.933	0.0206	1	1	46	6.76E-09	18.8
GAA	Lysosomal alpha-glucosidase	0.932	0.0209	4	4	235	1.01E-05	2.8
ACLY	ATP-citrate synthase	0.931	0.0214	1	1	69	0.0015	5.9
CCT8	T-complex protein 1 subunit theta	0.931	0.0214	3	3	182	0.0002	4.7
N/A	Tubulin beta-7 chain	0.930	0.0218	4	4	234	0.0001	2.8
CLNS1A	Methylosome subunit pICln	0.930	0.0221	1	1	71	0.0055	3.9
Psap	Sulfated glycoprotein 1	0.930	0.0222	2	2	113	2.23E-06	10.6
VNN1	Pantetheinase	0.929	0.0222	1	1	86	1.75E-05	4.4
SF3B5	Splicing factor 3B subunit 5	0.929	0.0223	1	1	60	1.40E-05	7.2
EEF2	Endoplasmin	0.928	0.0228	8	6	426	2.34E-07	23.6
PSMA7	Proteasome subunit alpha type-7-like	0.927	0.0232	2	2	136	0.0003	4.0
CSRP1	cysteine-rich with EGF-like domain protein 2 precursor	0.927	0.0233	1	1	78	0.0028	79.1
CRELD2	Cytochrome c, somatic	0.927	0.0236	3	3	156	1.05E-05	4.0
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase-like	0.926	0.0239	2	2	118	2.36E-06	5.0
PSMA5	Proteasome subunit alpha type-5	0.925	0.0246	2	2	111	4.54E-06	6.0
EEF1G	Elongation factor 2	0.924	0.0250	6	6	300	5.55E-06	4.2
TUBA4A	tubulin alpha-4A chain	0.922	0.0257	2	2	96	0.0007	2.9
SGSH	N-sulphoglucosamine sulphohydrolase	0.922	0.0259	1	1	71	0.0018	2.0
PSMB1	Proteasome subunit beta type-1	0.921	0.0261	1	1	69	0.0019	2.9

EIF3G	Eukaryotic translation initiation factor 3 subunit I	0.920	0.0266	1	1	49	1.54E-06	22.6
MYBBP1A	Myb-binding protein 1A	0.920	0.0269	3	3	180	4.34E-07	5.1
IDUA	Alpha-L-iduronidase	0.919	0.0274	3	3	183	2.11E-07	2.7
NEDD4	EGF-containing fibulin-like extracellular matrix protein 2	0.919	0.0276	1	1	69	0.0002	2.4
HSP90AB1	Heme oxygenase 1	0.918	0.0277	1	1	69	3.31E-06	5.7
RPL27	60S ribosomal protein L27	0.918	0.0280	1	1	41	9.92E-06	4.1
RPL13	60S ribosomal protein L13	0.916	0.0286	1	1	52	3.10E-06	5.3
RBM3	Putative RNA-binding protein 3	0.916	0.0287	1	1	66	0.0005	201.5
MTHFD1	Calcium-dependent serine proteinase	0.915	0.0294	4	4	196	0.0003	2.5
MAN2B1	lysosomal alpha-mannosidase	0.914	0.0298	3	3	249	0.0002	2.9
GGH	General vesicular transport factor p115	0.914	0.0299	1	1	72	3.43E-06	4.3
LASP1	Lipoprotein lipase	0.913	0.0305	4	4	200	3.58E-06	20.7
EFEMP2	Elongation factor 1-alpha 1	0.913	0.0306	4	4	187	0.0002	2.8
PARVA	Alpha-parvin	0.911	0.0317	1	1	46	0.0162	6.5
HDGF	Heterogeneous nuclear ribonucleoprotein A/B	0.911	0.0317	2	2	114	0.0082	3.1
ADAM17	DNA-binding protein A	0.910	0.0318	1	1	81	0.0007	3.3
PXDN	peroxidasin homolog	0.910	0.0321	7	6	359	4.84E-05	3.6
APP	Amyloid beta A4 protein	0.909	0.0323	3	3	148	0.0003	2.4
HDLBP	Vigilin	0.908	0.0330	1	1	56	3.01E-07	12.4
NRP1	Neuropilin-1	0.908	0.0330	1	1	99	0.0004	2.3
RPL17	60S ribosomal protein L17	0.908	0.0333	1	1	49	1.06E-06	4.8
SBSN	Suprabasin	0.907	0.0334	11	11	856	1.12E-06	5.3
HNRNPD	Heterogeneous nuclear ribonucleoprotein F	0.907	0.0336	2	2	120	3.58E-05	6.7
GLA	Alpha-galactosidase A	0.905	0.0345	3	3	176	6.70E-06	2.1
PDCD6IP	Programmed cell death 6-interacting protein	0.905	0.0346	3	3	155	0.0005	4.2
CCT8	T-complex protein 1 subunit theta_DUP2	0.905	0.0348	1	1	89	0.0004	3.1
DBN1	Drebrin	0.905	0.0348	1	1	93	0.0057	7.6
CDC37	Hydroxymethylglutaryl-CoA synthase, cytoplasmic	0.904	0.0354	1	1	40	0.0003	3.3
DBN1	Dynein light chain 2, cytoplasmic	0.903	0.0356	1	1	54	0.0021	6.2
PDXK	Pyridoxal kinase	0.902	0.0360	1	1	48	0.0006	7.2
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	0.901	0.0368	1	1	89	0.0002	3.0
RBMX	Heterogeneous nuclear ribonucleoprotein K	0.899	0.0378	2	2	116	1.04E-05	3.5
RPL31	60S ribosomal protein L31	0.898	0.0387	1	1	48	5.43E-06	8.3

LDHA	basement membrane-specific heparan sulfate proteoglycan core protein	0.897	0.0389	17	17	1013	6.22E-07	2.5
RAB10	Ras-related protein Rab-10	0.897	0.0390	1	1	46	0.0400	30.3
IMPA1	Inter-alpha-trypsin inhibitor heavy chain H5	0.895	0.0404	9	8	491	4.51E-06	2.5
CCT4	T-complex protein 1 subunit delta	0.894	0.0405	1	1	42	0.0002	35.6
CCT7	T-complex protein 1 subunit eta	0.893	0.0413	2	2	132	0.0017	3.2
CALU	Caprin-1	0.893	0.0413	1	1	78	0.0005	6.6
TM6SF2	Transmembrane 6 superfamily member 2	0.893	0.0415	2	2	98	1.37E-05	5.1
CTSD	Cathepsin L1	0.893	0.0415	1	1	68	0.0002	2.2
NEO1	Neogenin	0.892	0.0418	3	3	169	3.64E-05	2.4
PTGFRN	Prostaglandin F2 receptor negative regulator	0.891	0.0427	7	7	390	1.15E-05	5.3
DDX5	Decorin	0.889	0.0434	4	4	205	0.0003	2.8
PRMT5	Protein arginine N-methyltransferase 5	0.888	0.0442	1	1	57	6.40E-06	7.7
RPL23A	60S ribosomal protein L23a	0.888	0.0442	3	3	163	2.33E-05	3.0
NME2	Nucleoside diphosphate kinase B	0.887	0.0447	1	1	73	0.0124	4.7
RPS24	40S ribosomal protein S24	0.886	0.0454	1	1	47	0.0058	3.0
RPL5	60S ribosomal protein L5	0.886	0.0457	4	4	219	1.03E-06	2.8
CCT3	T-complex protein 1 subunit gamma	0.884	0.0463	4	4	246	0.0012	3.0
PPIC	Peptidyl-prolyl cis-trans isomerase C	0.883	0.0472	2	2	127	6.59E-06	3.7
EXT2	Exportin-2	0.881	0.0483	3	3	183	2.81E-06	10.4
LGALS3	Gamma-glutamyl hydrolase	0.880	0.0490	1	1	51	0.0162	1.7

Table 3.3.18: Pearson's correlation analysis was used as a means of measuring the linearity of protein expression over time in culture in the 31˚C culture. The list below displays host cell proteins that were found to correlate negatively (decrease in expression) with time in a DP12 culture.

Gene Symbol	Description	Pearson's Correlation	p-values	Total Peptides	Quantitative Peptides	Score	Anova p-value	Fold
CAND1	Cyclic AMP-dependent transcription factor ATF-6 beta	-0.970	0.006274	1	1	45	9.08E-03	6.03
COL5A1	Complement C3	-0.892	0.042018	11	11	619	3.95E-04	3.78

Table 3.3.19: Table of proteins common to 24hrs vs 120hrs 37˚C and 24hrs vs 120hrs 31˚C differentially expressed protein lists from a DP12 cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Up at	Comparison
YWHAB	14-3-3 protein beta/alpha	5	3	256	0.0003	30.5	120hrs	24hrs vs 120hrs 37C
		3	2	160	0.0002	22.1	120hrs	24hrs vs 120hrs 31C
YWHAE	14-3-3 protein epsilon	4	3	256	0.0053	8.8	120hrs	24hrs vs 120hrs 37C
		3	2	132	0.0005	12.1	120hrs	24hrs vs 120hrs 31C
YWHAH	14-3-3 protein eta	5	3	300	4.21E-06	18.7	120hrs	24hrs vs 120hrs 37C
		2	1	88	0.0001	81.1	120hrs	24hrs vs 120hrs 31C
YWHAZ	14-3-3 protein zeta/delta	2	1	115	0.0005	12.6	120hrs	24hrs vs 120hrs 37C
		3	2	142	0.0023	67.4	120hrs	24hrs vs 120hrs 31C
RPS18	40S ribosomal protein S18	2	2	95	1.31E-05	15.1	120hrs	24hrs vs 120hrs 37C
		2	2	101	0.0002	6.7	120hrs	24hrs vs 120hrs 31C
RPS3	40S ribosomal protein S3	3	3	170	0.0006	8.7	120hrs	24hrs vs 120hrs 37C
		2	2	95	0.0001	4.2	120hrs	24hrs vs 120hrs 31C
RPL23A	60S ribosomal protein L23a	3	3	156	0.0019	4.9	120hrs	24hrs vs 120hrs 37C
		2	2	98	0.0009	3.5	120hrs	24hrs vs 120hrs 31C
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4	4	210	1.03E-05	12.7	120hrs	24hrs vs 120hrs 37C
		2	2	101	0.0001	9.6	120hrs	24hrs vs 120hrs 31C
ACTG1	Actin, cytoplasmic 2	4	4	213	0.0001	7.5	120hrs	24hrs vs 120hrs 37C
		2	2	96	0.0001	4.6	120hrs	24hrs vs 120hrs 31C
AGRN	agrin-like isoform 1	2	2	128	0.0169	7.8	24hrs	24hrs vs 120hrs 37C
		3	3	159	0.0035	9.3	24hrs	24hrs vs 120hrs 31C
AKR1A1	Alcohol dehydrogenase (NADP+)	2	2	90	0.0003	10.2	120hrs	24hrs vs 120hrs 37C
		3	2	185	1.51E-05	19.4	120hrs	24hrs vs 120hrs 31C
ADH5	Alcohol dehydrogenase class-3	2	2	139	0.0002	23.1	120hrs	24hrs vs 120hrs 37C
		2	2	155	3.48E-05	10.3	120hrs	24hrs vs 120hrs 31C
ACTN4	Alpha-actinin-4	3	2	206	1.27E-05	28.5	120hrs	24hrs vs 120hrs 37C
		2	1	100	0.0041	23.0	120hrs	24hrs vs 120hrs 31C
ANXA5	Annexin A5	2	2	141	1.52E-05	12.1	120hrs	24hrs vs 120hrs 37C
		3	3	158	7.32E-06	7.9	120hrs	24hrs vs 120hrs 31C

MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	4	4	200	0.0001	14.7	120hrs	24hrs vs 120hrs 37C
		3	3	151	0.0022	4.1	120hrs	24hrs vs 120hrs 31C
CBR1	Carbonyl reductase NADPH 1	3	3	160	0.0020	18.3	120hrs	24hrs vs 120hrs 37C
		5	5	261	0.0003	6.8	120hrs	24hrs vs 120hrs 31C
CTSB	Cathepsin B	3	2	214	0.0180	1.6	120hrs	24hrs vs 120hrs 37C
		2	2	117	3.59E-05	4.3	120hrs	24hrs vs 120hrs 31C
CLIC1	Chloride intracellular channel protein 1	2	2	125	0.0002	5.3	120hrs	24hrs vs 120hrs 37C
		2	2	116	0.0002	3.2	120hrs	24hrs vs 120hrs 31C
C1ra	Complement C1r-A subcomponent	2	2	119	0.0001	8.3	24hrs	24hrs vs 120hrs 37C
		2	2	134	0.0019	4.5	24hrs	24hrs vs 120hrs 31C
CAND1	Cullin-associated NEDD8-dissociated protein 1	3	3	189	0.0001	20.2	120hrs	24hrs vs 120hrs 37C
		2	2	101	0.0006	7.2	120hrs	24hrs vs 120hrs 31C
EEF1G	Elongation factor 1-gamma	5	5	274	0.0020	11.4	120hrs	24hrs vs 120hrs 37C
		6	6	271	1.62E-05	8.9	120hrs	24hrs vs 120hrs 31C
EEF2	Elongation factor 2	3	3	149	0.0014	5.7	120hrs	24hrs vs 120hrs 37C
		5	5	251	0.0017	2.8	120hrs	24hrs vs 120hrs 31C
HSP90B1	Endoplasmin	3	3	148	3.17E-05	9.3	120hrs	24hrs vs 120hrs 37C
		6	4	314	2.05E-05	21.1	120hrs	24hrs vs 120hrs 31C
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	2	2	114	0.0003	3.4	120hrs	24hrs vs 120hrs 37C
		2	2	134	0.0054	3.0	120hrs	24hrs vs 120hrs 31C
ALDOA	Fructose-bisphosphate aldolase A	4	4	218	0.0011	10.4	120hrs	24hrs vs 120hrs 37C
		3	3	166	1.02E-05	10.3	120hrs	24hrs vs 120hrs 31C
GBA	glucosylceramidase	2	2	91	0.0196	2.2	120hrs	24hrs vs 120hrs 37C
		2	2	103	0.0014	2.9	120hrs	24hrs vs 120hrs 31C
GSTA4	Glutathione S-transferase A4	2	2	87	0.0001	63.9	120hrs	24hrs vs 120hrs 37C
		3	3	131	4.05E-05	18.9	120hrs	24hrs vs 120hrs 31C
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	2	2	149	0.0001	11.3	120hrs	24hrs vs 120hrs 37C
		2	2	147	0.0006	3.4	120hrs	24hrs vs 120hrs 31C
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	2	2	94	0.0014	16.5	120hrs	24hrs vs 120hrs 37C
		3	3	208	1.04E-05	3.6	120hrs	24hrs vs 120hrs 31C
HSPA4	Heat shock 70 kDa protein 4	3	3	222	0.0002	9.1	120hrs	24hrs vs 120hrs 37C
		6	6	337	0.0001	3.7	120hrs	24hrs vs 120hrs 31C
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	3	3	208	2.63E-05	8.1	120hrs	24hrs vs 120hrs 37C
		3	3	152	0.0003	9.6	120hrs	24hrs vs 120hrs 31C

HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	2	2	122	0.0010	4.2	120hrs	24hrs vs 120hrs 37C
		3	3	216	0.0052	2.2	120hrs	24hrs vs 120hrs 31C
KPNB1	Importin subunit beta-1	2	2	130	0.0006	24.1	120hrs	24hrs vs 120hrs 37C
		3	3	204	0.0009	4.1	120hrs	24hrs vs 120hrs 31C
IPO5	Importin-5	2	2	165	0.0054	15.7	120hrs	24hrs vs 120hrs 37C
		2	2	130	0.0001	5.0	120hrs	24hrs vs 120hrs 31C
ILF2	Interleukin enhancer-binding factor 2	3	3	185	0.0001	11.5	120hrs	24hrs vs 120hrs 37C
		2	2	121	3.80E-07	10.0	120hrs	24hrs vs 120hrs 31C
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	2	2	132	0.0035	23.9	120hrs	24hrs vs 120hrs 37C
		4	4	275	0.0002	7.4	120hrs	24hrs vs 120hrs 31C
LMNA	Lamin-A/C	9	9	663	0.0006	8.5	120hrs	24hrs vs 120hrs 37C
		6	6	370	1.71E-05	9.5	120hrs	24hrs vs 120hrs 31C
LASP1	LIM and SH3 domain protein 1	2	2	94	0.0003	53.2	120hrs	24hrs vs 120hrs 37C
		4	4	194	0.0001	3.5	120hrs	24hrs vs 120hrs 31C
LPL	Lipoprotein lipase	2	2	102	0.0089	12.3	120hrs	24hrs vs 120hrs 37C
		2	2	109	0.0013	4.9	120hrs	24hrs vs 120hrs 31C
GAA	Lysosomal alpha-glucosidase	3	3	173	0.0069	2.8	120hrs	24hrs vs 120hrs 37C
		3	3	190	0.0005	2.4	120hrs	24hrs vs 120hrs 31C
CAPG	Macrophage-capping protein	2	2	138	0.0002	13.8	120hrs	24hrs vs 120hrs 37C
		3	3	195	0.0003	4.7	120hrs	24hrs vs 120hrs 31C
MSN	Moesin	4	3	300	0.0003	18.4	120hrs	24hrs vs 120hrs 37C
		10	10	551	2.07E-05	5.3	120hrs	24hrs vs 120hrs 31C
NUCB1	Nucleobindin-1	2	1	103	0.0007	3.1	120hrs	24hrs vs 120hrs 37C
		3	2	182	0.0005	2.4	120hrs	24hrs vs 120hrs 31C
NUCB2	Nucleobindin-2	2	1	102	0.0064	4.1	120hrs	24hrs vs 120hrs 37C
		7	6	416	0.0008	3.7	120hrs	24hrs vs 120hrs 31C
NCL	Nucleolin	2	2	106	0.0004	7.5	120hrs	24hrs vs 120hrs 37C
		2	2	91	0.0018	12.9	120hrs	24hrs vs 120hrs 31C
NPM1	Nucleophosmin	3	3	164	0.0160	2.8	120hrs	24hrs vs 120hrs 37C
		2	2	123	0.0302	2.8	120hrs	24hrs vs 120hrs 31C
NAP1L1	Nucleosome assembly protein 1-like 1	2	1	101	4.19E-06	16.9	120hrs	24hrs vs 120hrs 37C
		2	2	91	0.0018	3.9	120hrs	24hrs vs 120hrs 31C
OLFML1	Olfactomedin-like protein 3	3	3	188	0.0011	4.1	24hrs	24hrs vs 120hrs 37C
		2	2	91	2.44E-05	4.3	24hrs	24hrs vs 120hrs 31C

PRDX1	Peroxiredoxin-1	2	2	87	0.0006	9.9	120hrs	24hrs vs 120hrs 37C
		2	2	81	0.0067	1.9	24hrs	24hrs vs 120hrs 31C
PA2G4	Proliferation-associated protein 2G4	5	5	315	0.0008	9.1	120hrs	24hrs vs 120hrs 37C
		3	3	194	0.0003	8.7	120hrs	24hrs vs 120hrs 31C
PTGFRN	Prostaglandin F2 receptor negative regulator	3	3	222	0.0014	10.3	120hrs	24hrs vs 120hrs 37C
		4	4	218	0.0034	2.9	120hrs	24hrs vs 120hrs 31C
PTGR1	Prostaglandin reductase 1	2	1	89	0.0005	77.7	120hrs	24hrs vs 120hrs 37C
		2	1	96	0.0054	18.9	120hrs	24hrs vs 120hrs 31C
PSME1	Proteasome activator complex subunit 1	3	3	187	0.0021	3.2	120hrs	24hrs vs 120hrs 37C
		2	2	144	0.0001	3.4	120hrs	24hrs vs 120hrs 31C
PSMB6	Proteasome subunit beta type-6	3	3	173	0.0084	10.2	120hrs	24hrs vs 120hrs 37C
		2	2	123	0.0012	11.1	120hrs	24hrs vs 120hrs 31C
PDIA3	Protein disulfide-isomerase A3	5	5	284	0.0011	12.4	120hrs	24hrs vs 120hrs 37C
		4	4	221	0.0001	16.3	120hrs	24hrs vs 120hrs 31C
PNP	Purine nucleoside phosphorylase	3	3	182	1.94E-05	4.9	120hrs	24hrs vs 120hrs 37C
		2	2	119	0.0005	6.3	120hrs	24hrs vs 120hrs 31C
SERPINB6	Serpin B6	2	2	124	0.0008	10.0	120hrs	24hrs vs 120hrs 37C
		2	2	160	0.0004	6.8	120hrs	24hrs vs 120hrs 31C
CCT4	T-complex protein 1 subunit delta	2	2	100	0.0088	36.9	120hrs	24hrs vs 120hrs 37C
		3	3	205	0.0042	3.8	120hrs	24hrs vs 120hrs 31C
TXNDC5	Thioredoxin domain-containing protein 5	2	2	96	0.0045	17.0	120hrs	24hrs vs 120hrs 37C
		2	2	107	0.0002	19.7	120hrs	24hrs vs 120hrs 31C
TXNRD1	Thioredoxin reductase 1, cytoplasmic	4	4	281	0.0011	15.1	120hrs	24hrs vs 120hrs 37C
		3	3	161	0.0003	8.9	120hrs	24hrs vs 120hrs 31C
TALDO1	Transaldolase	5	5	329	0.0003	21.7	120hrs	24hrs vs 120hrs 37C
		4	4	271	0.0004	9.3	120hrs	24hrs vs 120hrs 31C
TKT	Transketolase	6	6	336	0.0007	4.8	120hrs	24hrs vs 120hrs 37C
		6	6	318	0.0001	5.9	120hrs	24hrs vs 120hrs 31C
TPM4	Tropomyosin alpha-4 chain	3	2	167	0.0103	6.2	120hrs	24hrs vs 120hrs 37C
		2	2	115	0.0001	1540.5	120hrs	24hrs vs 120hrs 31C
VCL	Vinculin	3	3	182	0.0001	18.4	120hrs	24hrs vs 120hrs 37C
		2	2	107	0.0026	12.5	120hrs	24hrs vs 120hrs 31C

Table 3.3.20: Table of proteins common to 24hrs vs 144hrs 37˚C and 24hrs vs 144hrs 31˚C differentially expressed protein lists from a DP12 cell line. This table also includes information from 37˚C vs 31˚C at 144hrs so as to provide an indication of which culture condition the relative abundance of the given HCP is greatest.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Up in	Comparison
YWHAG	14-3-3 protein gamma	3	1	138	0.0003	90.5	144hrs	24hrs vs 144hrs 37C
		2	2	99	0.0002	23.2	144hrs	24hrs vs 144hrs 31C
		1	1	46	0.0140	1.8	37C	37C vs 31C 144hrs
HSPA5	78 kDa glucose-regulated protein	3	3	161	0.0003	39.8	144hrs	24hrs vs 144hrs 37C
		8	8	546	4.01E-05	19.7	144hrs	24hrs vs 144hrs 31C
		3	3	179	0.0071	1.8	31C	37C vs 31C 144hrs
ACTN1	Alpha-actinin-1	6	5	354	0.0001	8.7	144hrs	24hrs vs 144hrs 37C
		6	5	309	0.0001	4.2	144hrs	24hrs vs 144hrs 31C
		4	4	203	0.0046	1.5	37C	37C vs 31C 144hrs
CLSTN1	Calsyntenin-1	2	2	99	0.0024	273.9	144hrs	24hrs vs 144hrs 37C
		4	4	215	0.0054	2.6	144hrs	24hrs vs 144hrs 31C
		1	1	88	0.0043	2.7	37C	37C vs 31C 144hrs
CALU	Calumenin	3	3	138	1.03E-05	9.5	144hrs	24hrs vs 144hrs 37C
		2	2	111	0.0151	17.8	144hrs	24hrs vs 144hrs 31C
		1	1	55	0.0494	1.6	37C	37C vs 31C 144hrs
CCDC8	coiled-coil domain-containing protein 80-like	3	3	152	0.0424	2.0	144hrs	24hrs vs 144hrs 37C
		6	6	420	0.0096	2.9	144hrs	24hrs vs 144hrs 31C
		3	3	175	0.0014	2.6	31C	37C vs 31C 144hrs
C3	Complement C3	11	11	557	0.0001	12.7	24hrs	24hrs vs 144hrs 37C
		7	7	437	0.0017	4.4	24hrs	24hrs vs 144hrs 31C
		2	2	92	0.0095	2.4	31C	37C vs 31C 144hrs
FN1	Fibronectin	3	3	130	0.0128	5.0	144hrs	24hrs vs 144hrs 37C
		8	8	456	0.0073	2.6	144hrs	24hrs vs 144hrs 31C
		4	4	262	0.0163	1.7	37C	37C vs 31C 144hrs
GSS	glutathione synthetase-like	4	4	277	0.0005	9.3	144hrs	24hrs vs 144hrs 37C
		5	5	259	0.0003	5.7	144hrs	24hrs vs 144hrs 31C

		2	2	88	0.0197	1.5	31C	37C vs 31C 144hrs
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	2	2	88	0.0071	13.4	144hrs	24hrs vs 144hrs 37C
		3	1	170	0.0003	40.9	144hrs	24hrs vs 144hrs 31C
		3	1	183	0.0250	2.0	31C	37C vs 31C 144hrs
HIST1H2AG	Histone H2A type 1	2	2	115	0.0019	4.6	144hrs	24hrs vs 144hrs 37C
		3	2	187	0.0002	7.8	144hrs	24hrs vs 144hrs 31C
		2	2	115	0.0021	2.0	31C	37C vs 31C 144hrs
HYOU1	Hypoxia up-regulated protein 1	3	3	144	0.0017	4.5	144hrs	24hrs vs 144hrs 37C
		2	2	127	0.0009	5.0	144hrs	24hrs vs 144hrs 31C
		2	2	104	0.0156	1.6	37C	37C vs 31C 144hrs
LAMC1	Laminin subunit gamma-1	2	2	110	0.0087	4.6	24hrs	24hrs vs 144hrs 37C
		3	3	175	0.0203	2.6	144hrs	24hrs vs 144hrs 31C
		3	3	175	0.0251	1.6	31C	37C vs 31C 144hrs
LDHA	L-lactate dehydrogenase A chain	2	2	124	0.0001	20.3	144hrs	24hrs vs 144hrs 37C
		4	4	206	0.0001	25.6	144hrs	24hrs vs 144hrs 31C
		1	1	45	0.0001	3.0	31C	37C vs 31C 144hrs
MMP9	matrix metalloproteinase-9	4	4	269	0.0002	7.6	24hrs	24hrs vs 144hrs 37C
		2	2	89	0.0015	4.1	24hrs	24hrs vs 144hrs 31C
		1	1	70	0.0315	1.7	31C	37C vs 31C 144hrs
Cald1	Non-muscle caldesmon	3	3	147	0.0001	11.0	144hrs	24hrs vs 144hrs 37C
		4	4	178	0.0022	5.5	144hrs	24hrs vs 144hrs 31C
		1	1	45	0.0319	1.6	37C	37C vs 31C 144hrs
PGAM1	Phosphoglycerate mutase 1	3	3	179	0.0007	13.3	144hrs	24hrs vs 144hrs 37C
		2	2	209	0.0005	5.5	144hrs	24hrs vs 144hrs 31C
		1	1	71	0.0040	1.7	37C	37C vs 31C 144hrs
SERPINF1	Pigment epithelium-derived factor	2	2	110	0.0021	3.9	144hrs	24hrs vs 144hrs 37C
		2	2	118	0.0055	1.7	144hrs	24hrs vs 144hrs 31C
		1	1	52	0.0004	4.1	37C	37C vs 31C 144hrs
PLS3	Plastin-3	2	2	137	0.0001	119.4	144hrs	24hrs vs 144hrs 37C
		3	3	224	0.0008	6.3	144hrs	24hrs vs 144hrs 31C
		3	3	225	0.0001	1.5	37C	37C vs 31C 144hrs
P4hb	Protein disulfide-isomerase	6	6	329	0.0003	6.0	144hrs	24hrs vs 144hrs 37C
		3	3	150	3.83E-05	10.1	144hrs	24hrs vs 144hrs 31C

		1	1	56	0.0188	1.6	31C	37C vs 31C 144hrs
PDIA4	Protein disulfide-isomerase A4	3	3	155	0.0001	7.4	144hrs	24hrs vs 144hrs 37C
		3	3	209	4.27E-06	25.1	144hrs	24hrs vs 144hrs 31C
		1	1	45	0.0133	1.8	37C	37C vs 31C 144hrs
PKM	Pyruvate kinase isozymes M1/M2	6	6	335	0.0001	6.0	144hrs	24hrs vs 144hrs 37C
		5	5	353	0.0004	3.5	144hrs	24hrs vs 144hrs 31C
		1	1	55	0.0087	1.6	31C	37C vs 31C 144hrs
SERPINH1	Serpin H1	2	2	116	0.0003	9.5	144hrs	24hrs vs 144hrs 37C
		3	3	159	0.0003	7.1	144hrs	24hrs vs 144hrs 31C
		5	5	294	0.0117	1.6	37C	37C vs 31C 144hrs
Psap	Sulfated glycoprotein 1	2	2	91	0.0094	27.1	144hrs	24hrs vs 144hrs 37C
		3	3	147	0.0090	38.0	144hrs	24hrs vs 144hrs 31C
		2	2	126	0.0231	5.0	37C	37C vs 31C 144hrs
SBSN	Suprabasin	6	6	466	0.0022	2.5	144hrs	24hrs vs 144hrs 37C
		4	4	242	0.0443	1.8	144hrs	24hrs vs 144hrs 31C
		2	2	135	0.0064	1.6	31C	37C vs 31C 144hrs
THBS1	thrombospondin-1	5	5	266	0.0006	9.5	24hrs	24hrs vs 144hrs 37C
		5	4	275	0.0348	2.0	24hrs	24hrs vs 144hrs 31C
		1	1	59	0.0065	1.7	31C	37C vs 31C 144hrs
VCP	Transitional endoplasmic reticulum ATPase	7	7	490	0.0001	5.8	144hrs	24hrs vs 144hrs 37C
		8	8	441	0.0004	7.8	144hrs	24hrs vs 144hrs 31C
		9	9	554	0.0047	1.7	31C	37C vs 31C 144hrs
TPM3	tropomyosin alpha-3 chain isoform 1	2	1	117	0.0017	8.6	144hrs	24hrs vs 144hrs 37C
		4	4	211	0.0006	8.6	144hrs	24hrs vs 144hrs 31C
		3	1	159	0.0222	1.5	37C	37C vs 31C 144hrs
UGDH	UDP-glucose 6-dehydrogenase	4	4	254	0.0001	5.6	144hrs	24hrs vs 144hrs 37C
		6	6	385	3.96E-06	8.1	144hrs	24hrs vs 144hrs 31C
		2	2	141	4.27E-05	3.0	31C	37C vs 31C 144hrs
VIM	Vimentin	9	9	488	4.67E-05	10.5	144hrs	24hrs vs 144hrs 37C
		9	9	471	2.16E-05	14.6	144hrs	24hrs vs 144hrs 31C
		7	7	419	0.0007	1.8	31C	37C vs 31C 144hrs

Table 3.3.21: Table of proteins common to Pearson correlation analysis of protein expression over time at 24, 72, 96,120 and 144 hours at 37˚C and 24, 72, 96,120 and 144 hours at 31˚C in a DP12 cell line.

Gene Symbol	Description	Pearsons correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Up at	Comparison
YWHAE	14-3-3 protein epsilon	0.9048	0.0347	3	3	212	1.96E-05	3.9	144hrs	24hrs vs 144hrs 37C
		0.9751	0.0047	10	8	481	3.33E-06	4.7	144hrs	24hrs vs 144hrs 31C
YWHAH	14-3-3 protein eta	0.9452	0.0153	4	3	259	1.98E-08	9.0	144hrs	24hrs vs 144hrs 37C
		0.9686	0.0067	5	1	235	3.43E-05	13.6	144hrs	24hrs vs 144hrs 31C
RPS15A	40S ribosomal protein S15a	0.9856	0.0021	1	1	49	3.06E-07	9.5	144hrs	24hrs vs 144hrs 37C
		0.9859	0.0020	2	2	96	9.04E-09	6.4	144hrs	24hrs vs 144hrs 31C
RPS16	40S ribosomal protein S16	0.9691	0.0065	1	1	53	8.95E-05	7.8	144hrs	24hrs vs 144hrs 37C
		0.9410	0.0171	1	1	51	7.60E-04	7.9	144hrs	24hrs vs 144hrs 31C
RPS17	40S ribosomal protein S17	0.9366	0.0190	1	1	58	5.61E-05	9.5	144hrs	24hrs vs 144hrs 37C
		0.9697	0.0063	1	1	58	2.72E-05	10.0	144hrs	24hrs vs 144hrs 31C
RPS18	40S ribosomal protein S18	0.8893	0.0435	2	2	103	2.84E-04	3.5	144hrs	24hrs vs 144hrs 37C
		0.9755	0.0046	5	5	265	1.25E-06	8.8	144hrs	24hrs vs 144hrs 31C
RPS20	40S ribosomal protein S20	0.9265	0.0237	1	1	48	1.14E-04	15.5	144hrs	24hrs vs 144hrs 37C
		0.9458	0.0150	1	1	52	3.71E-07	12.7	144hrs	24hrs vs 144hrs 31C
RPS3A	40S ribosomal protein S3a	0.9746	0.0048	3	3	178	4.71E-05	9.0	144hrs	24hrs vs 144hrs 37C
		0.9805	0.0032	1	1	75	2.06E-06	9.6	144hrs	24hrs vs 144hrs 31C
SDF4	45 kDa calcium-binding protein	-0.8954	0.0399	1	1	47	3.69E-03	2.1	24hrs	24hrs vs 144hrs 37C
		0.9616	0.0090	3	3	185	1.34E-03	2.1	144hrs	24hrs vs 144hrs 31C
RPLP2	60S acidic ribosomal protein P2	0.9282	0.0228	1	1	68	5.00E-03	17.4	144hrs	24hrs vs 144hrs 37C
		0.9572	0.0105	1	1	72	7.56E-05	19.3	144hrs	24hrs vs 144hrs 31C
RPL12	60S ribosomal protein L12	0.9494	0.0136	1	1	49	1.41E-05	4.2	144hrs	24hrs vs 144hrs 37C
		0.9863	0.0019	1	1	56	4.04E-07	8.3	144hrs	24hrs vs 144hrs 31C
RPL23	60S ribosomal protein L23	0.9229	0.0254	1	1	89	2.05E-02	3.1	144hrs	24hrs vs 144hrs 37C
		0.9365	0.0190	1	1	42	2.09E-05	593.8	144hrs	24hrs vs 144hrs 31C
RPL29	60S ribosomal protein L29	0.9782	0.0038	1	1	57	1.78E-02	32.0	144hrs	24hrs vs 144hrs 37C
		0.9565	0.0108	1	1	61	1.32E-03	140.9	144hrs	24hrs vs 144hrs 31C
RPL5	60S ribosomal protein L5	0.8840	0.0466	1	1	45	6.13E-03	7.0	144hrs	24hrs vs 144hrs 37C
		0.8855	0.0457	4	4	219	1.03E-06	2.8	144hrs	24hrs vs 144hrs 31C
ADAMTS1	A disintegrin and metalloproteinase	-0.9249	0.0244	4	4	266	1.04E-07	7.8	24hrs	24hrs vs 144hrs 37C

	with thrombospondin motifs 1	0.9668	0.0072	1	1	78	1.25E-04	31.8	144hrs	24hrs vs 144hrs 31C
AHCY	adenosylhomocysteinase	0.9496	0.0135	5	5	286	4.42E-09	11.9	144hrs	24hrs vs 144hrs 37C
		0.9906	0.0011	3	3	227	4.18E-08	11.7	144hrs	24hrs vs 144hrs 31C
AK2	Adenylate kinase 2, mitochondrial	0.9135	0.0301	1	1	60	4.79E-02	31.1	144hrs	24hrs vs 144hrs 37C
		0.9761	0.0044	2	2	104	1.18E-06	28.9	144hrs	24hrs vs 144hrs 31C
ADSL	Adenylosuccinate lyase	0.8873	0.0446	1	1	48	1.80E-04	6.6	144hrs	24hrs vs 144hrs 37C
		0.9957	0.0003	3	3	147	1.57E-04	15.3	144hrs	24hrs vs 144hrs 31C
ACTN4	Alpha-actinin-4	0.9085	0.0328	4	2	222	4.83E-05	4.6	144hrs	24hrs vs 144hrs 37C
		0.9553	0.0113	3	1	200	3.32E-06	52.1	144hrs	24hrs vs 144hrs 31C
GOT1	aspartate aminotransferase, cytoplasmic	0.8847	0.0462	1	1	44	1.10E-03	4.4	144hrs	24hrs vs 144hrs 37C
		0.9773	0.0041	5	5	297	7.54E-07	14.8	144hrs	24hrs vs 144hrs 31C
CNN2	Calponin-2	0.9236	0.0251	1	1	64	8.03E-04	55.8	144hrs	24hrs vs 144hrs 37C
		0.9634	0.0084	1	1	58	7.42E-06	57.8	144hrs	24hrs vs 144hrs 31C
CBR1	Carbonyl reductase	0.9414	0.0169	2	2	104	1.47E-05	12.9	144hrs	24hrs vs 144hrs 37C
		0.9766	0.0043	4	4	216	3.56E-07	8.1	144hrs	24hrs vs 144hrs 31C
ARCN1	coatomer subunit delta	0.9053	0.0345	1	1	56	5.79E-03	7.8	144hrs	24hrs vs 144hrs 37C
		0.9521	0.0125	1	1	52	2.70E-07	30.2	144hrs	24hrs vs 144hrs 31C
CORO1B	coronin-1B	0.9862	0.0019	1	1	53	1.10E-03	60.7	144hrs	24hrs vs 144hrs 37C
		0.9887	0.0014	1	1	56	3.54E-09	11.9	144hrs	24hrs vs 144hrs 31C
EEF1G	elongation factor 1-gamma	0.9622	0.0088	4	4	242	4.54E-07	11.1	144hrs	24hrs vs 144hrs 37C
		0.9808	0.0032	6	6	309	4.86E-08	9.4	144hrs	24hrs vs 144hrs 31C
EEF2	elongation factor 2	0.9912	0.0010	6	6	308	1.32E-06	14.9	144hrs	24hrs vs 144hrs 37C
		0.9238	0.0250	6	6	300	5.55E-06	4.2	144hrs	24hrs vs 144hrs 31C
HSP90B1	endoplasmin	0.9368	0.0189	4	4	230	9.67E-07	8.5	144hrs	24hrs vs 144hrs 37C
		0.9282	0.0228	8	6	426	2.34E-07	23.6	144hrs	24hrs vs 144hrs 31C
EXT2	Exostosin-2	-0.9435	0.0160	1	1	40	2.95E-03	5.3	24hrs	24hrs vs 144hrs 37C
		0.9356	0.0194	1	1	60	1.21E-04	2.1	144hrs	24hrs vs 144hrs 31C
CAPZA1	F-actin-capping protein subunit alpha-1	0.9801	0.0034	1	1	60	1.25E-04	20.0	144hrs	24hrs vs 144hrs 37C
		0.9845	0.0023	1	1	77	1.75E-02	7.7	144hrs	24hrs vs 144hrs 31C
CAPZB	F-actin-capping protein subunit beta	0.9807	0.0032	1	1	98	1.44E-07	7.4	144hrs	24hrs vs 144hrs 37C
		0.9601	0.0095	3	3	194	1.74E-07	8.2	144hrs	24hrs vs 144hrs 31C
GPI	glucose-6-phosphate isomerase	0.9127	0.0306	2	2	108	4.68E-05	4.5	144hrs	24hrs vs 144hrs 37C
		0.9653	0.0077	2	2	107	2.47E-07	5.4	144hrs	24hrs vs 144hrs 31C
GNB2L1	Guanine nucleotide-binding protein	0.9380	0.0184	2	2	122	7.20E-05	10.3	144hrs	24hrs vs 144hrs 37C

	subunit beta-2-like 1	0.9668	0.0072	2	2	137	1.67E-06	4.0	144hrs	24hrs vs 144hrs 31C
HSPA13	Heat shock 70 kDa protein 13	-0.8999	0.0375	3	3	168	8.52E-07	3.3	24hrs	24hrs vs 144hrs 37C
		0.9379	0.0184	10	10	552	4.68E-08	2.5	144hrs	24hrs vs 144hrs 31C
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	0.8801	0.0489	2	2	124	9.20E-04	3.3	144hrs	24hrs vs 144hrs 37C
		0.9105	0.0317	2	2	114	8.17E-03	3.1	144hrs	24hrs vs 144hrs 31C
RBBP4	Histone-binding protein RBBP4	0.9089	0.0325	1	1	44	1.64E-04	Infinity	144hrs	24hrs vs 144hrs 37C
		0.9628	0.0086	1	1	52	6.65E-04	6.7	144hrs	24hrs vs 144hrs 31C
ST13	Hsc70-interacting protein	0.9545	0.0116	1	1	57	1.88E-04	10.1	144hrs	24hrs vs 144hrs 37C
		0.9724	0.0055	1	1	63	4.23E-06	12.4	144hrs	24hrs vs 144hrs 31C
ILF2	interleukin enhancer-binding factor 2	0.9156	0.0291	1	1	72	1.27E-04	17.6	144hrs	24hrs vs 144hrs 37C
		0.9770	0.0042	2	2	121	2.35E-07	11.9	144hrs	24hrs vs 144hrs 31C
GLO1	Lactoylglutathione lyase	0.9141	0.0298	2	2	117	6.22E-06	5.4	144hrs	24hrs vs 144hrs 37C
		0.9796	0.0035	1	1	50	2.39E-04	12.1	144hrs	24hrs vs 144hrs 31C
CAPG	Macrophage-capping protein	0.9136	0.0301	1	1	85	5.16E-06	4.0	144hrs	24hrs vs 144hrs 37C
		0.9737	0.0051	4	4	297	1.03E-04	4.3	144hrs	24hrs vs 144hrs 31C
MSN	moesin	0.9055	0.0344	5	3	269	1.53E-07	8.7	144hrs	24hrs vs 144hrs 37C
		0.9701	0.0062	11	8	611	8.65E-08	13.2	144hrs	24hrs vs 144hrs 31C
MYL6	Myosin light polypeptide 6	0.9004	0.0372	1	1	61	3.04E-05	24.7	144hrs	24hrs vs 144hrs 37C
		0.9656	0.0076	1	1	61	5.48E-06	24.4	144hrs	24hrs vs 144hrs 31C
NUDC	Nuclear migration protein nudC	0.9536	0.0119	1	1	58	5.39E-04	4.0	144hrs	24hrs vs 144hrs 37C
		0.9697	0.0063	1	1	59	8.85E-06	7.6	144hrs	24hrs vs 144hrs 31C
NCL	nucleolin	0.9018	0.0364	5	5	268	5.65E-06	2.7	144hrs	24hrs vs 144hrs 37C
		0.9760	0.0044	4	4	198	7.57E-06	4.4	144hrs	24hrs vs 144hrs 31C
NPM1	Nucleophosmin	0.9740	0.0050	1	1	46	6.13E-03	95.8	144hrs	24hrs vs 144hrs 37C
		0.9364	0.0191	1	1	59	1.23E-05	1804.6	144hrs	24hrs vs 144hrs 31C
NAP1L1	Nucleosome assembly protein 1-like 1	0.9812	0.0031	1	1	61	1.04E-05	7.9	144hrs	24hrs vs 144hrs 37C
		0.9714	0.0058	1	1	61	6.92E-05	4.2	144hrs	24hrs vs 144hrs 31C
NAP1L4	Nucleosome assembly protein 1-like 4	0.9160	0.0289	1	1	63	8.30E-04	7.5	144hrs	24hrs vs 144hrs 37C
		0.9575	0.0105	1	1	58	3.24E-04	35.1	144hrs	24hrs vs 144hrs 31C
OLFML1	Olfactomedin-like protein 3	-0.9240	0.0248	3	3	194	5.26E-09	8.6	24hrs	24hrs vs 144hrs 37C
		0.9468	0.0146	2	2	99	3.12E-04	3.7	144hrs	24hrs vs 144hrs 31C
VNN1	pantetheinase	-0.9573	0.0105	1	1	91	6.08E-04	1.7	24hrs	24hrs vs 144hrs 37C
		0.9295	0.0222	1	1	86	1.75E-05	4.4	144hrs	24hrs vs 144hrs 31C
PRDX1	Peroxiredoxin-1	0.9224	0.0256	4	3	229	3.44E-06	4.0	144hrs	24hrs vs 144hrs 37C

		0.9416	0.0168	2	2	83	2.25E-07	9.6	144hrs	24hrs vs 144hrs 31C
PEBP1	Phosphatidylethanolamine-binding protein 1	0.9202	0.0267	1	1	47	1.69E-05	10.7	144hrs	24hrs vs 144hrs 37C
		0.9789	0.0037	1	1	69	1.46E-05	3.3	144hrs	24hrs vs 144hrs 31C
PGK1	phosphoglycerate kinase 1	0.8788	0.0497	2	2	92	1.81E-04	2.8	144hrs	24hrs vs 144hrs 37C
		0.9818	0.0029	3	3	189	2.35E-04	5.0	144hrs	24hrs vs 144hrs 31C
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	0.9354	0.0195	1	1	63	3.55E-03	69.5	144hrs	24hrs vs 144hrs 37C
		0.9874	0.0017	1	1	63	1.52E-04	12.7	144hrs	24hrs vs 144hrs 31C
PDIA3	Protein disulfide-isomerase A3	0.9115	0.0312	4	4	209	8.20E-07	3.1	144hrs	24hrs vs 144hrs 37C
		0.9648	0.0079	7	7	412	2.35E-08	20.9	144hrs	24hrs vs 144hrs 31C
PDIA6	Protein disulfide-isomerase A6	0.9586	0.0100	4	4	291	3.45E-06	5.3	144hrs	24hrs vs 144hrs 37C
		0.9684	0.0067	7	7	480	2.01E-08	10.6	144hrs	24hrs vs 144hrs 31C
S100A13	Protein S100-A13	0.9824	0.0028	1	1	44	1.92E-07	5.7	144hrs	24hrs vs 144hrs 37C
		0.9808	0.0032	1	1	53	8.33E-08	24.1	144hrs	24hrs vs 144hrs 31C
PNP	Purine nucleoside phosphorylase	0.9033	0.0356	2	2	131	4.57E-04	3.6	144hrs	24hrs vs 144hrs 37C
		0.9746	0.0048	3	3	185	1.91E-05	5.0	144hrs	24hrs vs 144hrs 31C
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	0.9752	0.0047	1	1	48	7.35E-04	5.8	144hrs	24hrs vs 144hrs 37C
		0.9550	0.0114	1	1	53	1.40E-03	6.5	144hrs	24hrs vs 144hrs 31C
DDX39B	Spliceosome RNA helicase BAT1	0.9400	0.0175	1	1	40	9.02E-04	5.7	144hrs	24hrs vs 144hrs 37C
		0.9949	0.0004	2	2	124	8.95E-07	7.9	144hrs	24hrs vs 144hrs 31C
STIP1	Stress-induced-phosphoprotein 1	0.9073	0.0334	1	1	49	1.60E-03	8.0	144hrs	24hrs vs 144hrs 37C
		0.9490	0.0137	2	2	88	8.25E-06	9.6	144hrs	24hrs vs 144hrs 31C
TCP1	T-complex protein 1 subunit alpha	0.9468	0.0146	3	3	195	1.45E-03	13.8	144hrs	24hrs vs 144hrs 37C
		0.9797	0.0035	1	1	40	1.23E-04	20.7	144hrs	24hrs vs 144hrs 31C
CCT4	T-complex protein 1 subunit delta	0.9449	0.0154	3	3	153	1.08E-03	23.7	144hrs	24hrs vs 144hrs 37C
		0.8944	0.0405	1	1	42	1.65E-04	35.6	144hrs	24hrs vs 144hrs 31C
CCT7	T-complex protein 1 subunit eta	0.9353	0.0196	2	2	147	4.97E-03	3.9	144hrs	24hrs vs 144hrs 37C
		0.8930	0.0413	2	2	132	1.69E-03	3.2	144hrs	24hrs vs 144hrs 31C
TXNDC5	thioredoxin domain-containing protein 5	0.8942	0.0407	2	2	96	5.63E-06	9.4	144hrs	24hrs vs 144hrs 37C
		0.9630	0.0085	2	2	106	9.46E-06	12.2	144hrs	24hrs vs 144hrs 31C
ALYREF	THO complex subunit 4	0.8895	0.0434	1	1	60	1.93E-04	4.8	144hrs	24hrs vs 144hrs 37C
		0.9554	0.0112	1	1	62	1.67E-04	4.9	144hrs	24hrs vs 144hrs 31C
TFPI	tissue factor pathway inhibitor-like	-0.9370	0.0188	2	2	101	5.04E-04	5.5	24hrs	24hrs vs 144hrs 37C
		0.9681	0.0068	1	1	48	1.09E-08	20.5	144hrs	24hrs vs 144hrs 31C

TALDO1	Transaldolase	0.9550	0.0114	2	2	108	2.78E-08	9.0	144hrs	24hrs vs 144hrs 37C
		0.9643	0.0081	4	4	285	5.96E-07	10.4	144hrs	24hrs vs 144hrs 31C
TPI1	Triosephosphate isomerase	0.9707	0.0060	2	2	174	1.06E-05	22.8	144hrs	24hrs vs 144hrs 37C
		0.9679	0.0069	1	1	84	3.57E-07	6.5	144hrs	24hrs vs 144hrs 31C
VPS35	Vacuolar protein sorting-associated protein 35	0.9172	0.0283	1	1	50	9.45E-07	5.4	144hrs	24hrs vs 144hrs 37C
		0.9637	0.0083	1	1	59	4.75E-05	10.5	144hrs	24hrs vs 144hrs 31C

Table 3.3.22: Table of proteins common to 24, 72, 96,120 and 144 hours at 37˚C and 24, 72, 96,120 and 144 hours at 31˚C Pearson correlation lists from a DP12 cell line. This table also includes information from 37˚C vs 31˚C at 144hrs so as to provide an indication of which culture condition the relative abundance of the given HCP is greatest.

Gene Symbol	Description	Pearsons correlation	p-values	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Up at	Comparison
PSMD4	26S proteasome non-ATPase regulatory subunit 4	0.9373	0.0187	1	1	63	0.0001	3.5	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9779	0.0039	1	1	68	0.0001	8.4	144hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	131	0.0041	2.3	31C	37C vs 31C 144hrs
RPS12	40S ribosomal protein S12	0.9303	0.0218	2	2	84	0.0002	10.0	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9652	0.0077	1	1	47	4.51E-07	22.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	44	0.0217	417.0	37C	37C vs 31C 144hrs
HSPA5	78 kDa glucose-regulated protein	0.9097	0.0321	5	5	228	1.63E-08	4.2	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9398	0.0176	7	7	494	1.76E-07	25.2	144hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	179	0.0071	1.8	31C	37C vs 31C 144hrs
NAGLU	Alpha-N-acetylglucosaminidase-like	0.9028	0.0358	1	1	49	1.66E-06	9.0	120hrs	24, 72, 96 and 144hrs at 37˚C
		0.9930	0.0007	4	4	270	1.89E-09	15.8	144hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	212	0.0044	2.4	31C	37C vs 31C 144hrs
CALU	Calumenin	0.9328	0.0207	1	1	40	0.0030	3.0	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9520	0.0125	2	2	101	0.0001	81.8	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	55	0.0494	1.6	37C	37C vs 31C 144hrs
CAT	Catalase	0.9780	0.0039	1	1	87	0.0126	4.8	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9742	0.0050	3	2	160	4.10E-05	29.7	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	86	0.0073	2.0	31C	37C vs 31C 144hrs
C3	Complement C3	-0.9391	0.0179	13	13	668	1.16E-05	27.7	24hrs	24, 72, 96 and 144hrs at 37˚C
		-0.8918	0.0420	11	11	619	0.0004	3.8	24hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	92	0.0095	2.4	31C	37C vs 31C 144hrs
PHGDH	d-3-phosphoglycerate dehydrogenase-like	0.8788	0.0497	1	1	63	0.0137	36.4	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9795	0.0035	3	3	177	8.03E-09	12.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	197	2.35E-05	2.6	31C	37C vs 31C 144hrs
EEF1D	Elongation factor 1-delta	0.9219	0.0259	1	1	92	0.0001	14.5	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9746	0.0048	2	2	115	6.30E-09	10.2	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	70	0.0075	1.6	37C	37C vs 31C 144hrs

FERMT2	Fermitin family-like 2	0.8846	0.0463	1	1	45	0.0380	67.6	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9769	0.0042	1	1	71	0.0002	4.5	144hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	116	0.0127	1.8	37C	37C vs 31C 144hrs
GSS	glutathione synthetase-like	0.9297	0.0222	3	3	207	3.37E-06	4.3	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9767	0.0042	6	6	361	0.0001	4.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	88	0.0197	1.5	31C	37C vs 31C 144hrs
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	0.9265	0.0236	1	1	47	0.0007	6.3	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9070	0.0336	2	2	120	3.58E-05	6.7	120hrs	24, 72, 96 and 144hrs at 31˚C
				3	1	183	0.0250	2.0	31C	37C vs 31C 144hrs
HIST1H2AG	Histone H2A type 1	0.9944	0.0005	2	1	134	9.10E-06	14.9	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9337	0.0203	2	2	134	5.51E-08	11.1	120hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	115	0.0021	2.0	31C	37C vs 31C 144hrs
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	-0.9733	0.0052	4	4	216	0.0001	3.0	24hrs	24, 72, 96 and 144hrs at 37˚C
		0.8946	0.0404	9	8	491	4.51E-06	2.5	120hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	41	0.0098	1.8	31C	37C vs 31C 144hrs
LDHA	L-lactate dehydrogenase A chain	0.9771	0.0041	4	4	250	6.33E-08	5.1	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9783	0.0038	5	5	306	3.66E-10	39.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	45	0.0001	3.0	31C	37C vs 31C 144hrs
NRP1	Neuropilin-1	-0.9955	0.0004	1	1	73	3.12E-05	3.3	24hrs	24, 72, 96 and 144hrs at 37˚C
		0.9080	0.0330	1	1	99	0.0004	2.3	120hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	99	0.0011	2.2	31C	37C vs 31C 144hrs
PPIA	Peptidyl-prolyl cis-trans isomerase A	0.9290	0.0225	2	2	86	0.0001	3.6	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9603	0.0094	2	2	105	1.22E-06	13.7	120hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	145	0.0093	1.8	31C	37C vs 31C 144hrs
PLS3	Plastin-3	0.9370	0.0188	1	1	51	0.0037	10.8	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9853	0.0021	2	2	167	1.23E-05	6.9	144hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	225	0.0001	1.5	37C	37C vs 31C 144hrs
PCBP1	Poly(rC)-binding protein 1	0.9821	0.0029	1	1	44	7.59E-07	6.9	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9561	0.0110	1	1	55	1.80E-08	59.2	144hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	102	0.0016	2.9	31C	37C vs 31C 144hrs
PDIA4	Protein disulfide-isomerase A4	0.9136	0.0301	2	2	87	0.0001	12.3	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9643	0.0080	5	5	301	7.11E-07	9.9	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	45	0.0133	1.8	37C	37C vs 31C 144hrs

PKM	Pyruvate kinase isozymes M1/M2	0.9180	0.0279	6	6	404	2.45E-05	4.0	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9717	0.0057	10	10	582	0.0001	3.8	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	55	0.0087	1.6	31C	37C vs 31C 144hrs
RNH1	Ribonuclease inhibitor-like	0.9672	0.0071	1	1	58	0.0030	20.4	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9778	0.0040	1	1	67	8.78E-07	6.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				1	1	55	0.0012	2.0	31C	37C vs 31C 144hrs
SERPINH1	Serpin H1	0.9748	0.0048	4	4	236	2.53E-06	4.7	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9656	0.0076	4	4	200	3.04E-07	8.2	144hrs	24, 72, 96 and 144hrs at 31˚C
				5	5	294	0.0117	1.6	37C	37C vs 31C 144hrs
FUCA1	Tissue alpha-L-fucosidase	-0.9463	0.0148	1	1	91	0.0008	3.1	72hrs	24, 72, 96 and 144hrs at 37˚C
		0.9724	0.0055	2	2	137	1.74E-06	2.7	144hrs	24, 72, 96 and 144hrs at 31˚C
				3	3	170	0.0031	2.4	31C	37C vs 31C 144hrs
VCP	Transitional endoplasmic reticulum ATPase	0.9352	0.0196	4	4	233	2.61E-06	4.7	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9793	0.0036	7	7	410	2.54E-07	10.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				9	9	554	0.0047	1.7	31C	37C vs 31C 144hrs
UGDH	UDP-glucose 6-dehydrogenase	0.9583	0.0102	4	4	260	2.35E-05	2.7	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9890	0.0014	3	3	232	1.08E-06	5.6	144hrs	24, 72, 96 and 144hrs at 31˚C
				2	2	141	4.27E-05	3.0	31C	37C vs 31C 144hrs
VIM	Vimentin	0.9542	0.0117	9	9	500	1.72E-09	5.7	144hrs	24, 72, 96 and 144hrs at 37˚C
		0.9773	0.0041	10	10	530	1.38E-10	20.8	144hrs	24, 72, 96 and 144hrs at 31˚C
				7	7	419	0.0007	1.8	31C	37C vs 31C 144hrs

Table 3.3.23: Table indicating the number of differentially expressed HCPs identified in a CHO K1 and DP12 cell line compared to the number of differentially expressed HCPs common to both cell lines.

Comparison	Number of differentially expressed HCPs in the CHO K1 cell line	Number of differentially expressed HCPs in the DP12 cell line	Number of differentially expressed HCPs common to CHO K1 and DP12 cell lines
24hrs vs 120hrs / 144hrs at 37C	322	375	174
24hrs vs 120hrs / 144hrs at 31C	146	391	50
37C vs 31C at 24hrs	211	150	20
37C vs 31C at 120hrs / 144hrs	228	222	55

Table 3.3.24: Table of differentially expressed proteins common to a CHO K1 and DP12 cell line when 24hrs is compared to 120hrs (CHO K1) / 144hrs (DP12) at 37C.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Direction of fold change	Cell line
HSPE1	10 kDa heat shock protein, mitochondrial	1	1	53	0.0025	2.1	Up at 120hrs	CHO K1
		1	1	78	0.0012	6.7	Up at 144hrs	DP12
YWHAB	14-3-3 protein beta/alpha	1	1	62	0.0078	5.2	Up at 120hrs	CHO K1
		5	3	256	0.0003	30.5	Up at 144hrs	DP12
YWHAE	14-3-3 protein epsilon	2	2	111	0.0124	1.7	Up at 120hrs	CHO K1
		4	3	256	0.0053	8.8	Up at 144hrs	DP12
YWHAH	14-3-3 protein eta	1	1	55	0.0211	3.6	Up at 120hrs	CHO K1
		5	3	300	4.21E-06	18.7	Up at 144hrs	DP12
YWHAZ	14-3-3 protein zeta/delta	1	1	99	0.0460	2.4	Up at 120hrs	CHO K1
		2	1	115	0.0005	12.6	Up at 144hrs	DP12
RPS12	40S ribosomal protein S12	1	1	54	0.0038	17.9	Up at 120hrs	CHO K1
		1	1	40	0.0144	37.6	Up at 144hrs	DP12
RPS14	40S ribosomal protein S14	1	1	51	0.0282	6.8	Up at 120hrs	CHO K1
		1	1	63	0.0022	83.4	Up at 144hrs	DP12
RPS15A	40S ribosomal protein S15a	1	1	64	0.0317	4.4	Up at 120hrs	CHO K1
		1	1	62	0.0001	6.5	Up at 144hrs	DP12
RPS18	40S ribosomal protein S18	1	1	61	0.0013	4.5	Up at 120hrs	CHO K1
		2	2	95	1.31E-05	15.1	Up at 144hrs	DP12
RPS19	40S ribosomal protein S19	1	1	58	0.0115	3.0	Down at 120hrs	CHO K1
		1	1	43	0.0457	2.7	Up at 144hrs	DP12
RPS2	40S ribosomal protein S2	2	2	117	0.0193	4.8	Up at 120hrs	CHO K1
		1	1	48	0.0105	38.1	Up at 144hrs	DP12
RPS25	40S ribosomal protein S25	2	2	119	0.0316	3.0	Up at 120hrs	CHO K1
		1	1	65	0.0012	Infinity	Up at 144hrs	DP12
RPS3	40S ribosomal protein S3	2	2	135	0.0095	2.6	Up at 120hrs	CHO K1
		3	3	170	0.0006	8.7	Up at 144hrs	DP12
Rps3a	40S ribosomal protein S3a	1	1	61	0.0006	4.1	Up at 120hrs	CHO K1
		1	1	58	0.0008	11.9	Up at 144hrs	DP12

Rps4	40S ribosomal protein S4	1	1	60	0.0364	2.4	Up at 120hrs	CHO K1
		1	1	59	0.0154	68.6	Up at 144hrs	DP12
RPSA	40S ribosomal protein SA	3	3	204	0.0248	3.7	Up at 120hrs	CHO K1
		1	1	50	0.0033	48.2	Up at 144hrs	DP12
RPLP0	60S acidic ribosomal protein P0	1	1	53	0.0134	19.4	Up at 120hrs	CHO K1
		1	1	52	0.0001	13.5	Up at 144hrs	DP12
RPL18	60S ribosomal protein L18	1	1	58	0.0201	2.1	Up at 120hrs	CHO K1
		1	1	63	0.0192	1.6	Up at 144hrs	DP12
RPL19	60S ribosomal protein L19	1	1	41	0.0145	3.8	Up at 120hrs	CHO K1
		2	2	103	0.0058	47.3	Up at 144hrs	DP12
RPL29	60S ribosomal protein L29	1	1	57	0.0252	7.6	Up at 120hrs	CHO K1
		1	1	56	0.0349	84.8	Up at 144hrs	DP12
RPL5	60S ribosomal protein L5	3	3	160	0.0094	6.2	Up at 120hrs	CHO K1
		2	2	130	0.0025	11.5	Up at 144hrs	DP12
PGD	6-phosphogluconate dehydrogenase, decarboxylating	1	1	58	0.0355	3.1	Up at 120hrs	CHO K1
		4	4	210	1.03E-05	12.7	Up at 144hrs	DP12
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	58	0.0434	2.2	Down at 120hrs	CHO K1
		1	1	65	0.0007	4.3	Down at 144hrs	DP12
ACTG1	Actin, cytoplasmic 2	3	3	187	0.0002	2.7	Up at 120hrs	CHO K1
		4	4	213	0.0001	7.5	Up at 144hrs	DP12
SUB1	Activated RNA polymerase II transcriptional coactivator p15	1	1	42	0.0125	2.6	Up at 120hrs	CHO K1
		1	1	43	0.0004	4.4	Up at 144hrs	DP12
DBI	Acyl-CoA-binding protein	1	1	46	0.0098	1.6	Up at 120hrs	CHO K1
		2	2	109	0.0098	3.7	Up at 144hrs	DP12
AHCY	adenosylhomocysteinase	2	2	168	0.0249	3.0	Up at 120hrs	CHO K1
		3	3	176	1.65E-05	27.3	Up at 144hrs	DP12
AK2	Adenylate kinase 2, mitochondrial	1	1	46	0.0275	3.6	Up at 120hrs	CHO K1
		1	1	60	0.0011	65.5	Up at 144hrs	DP12
Arf2	ADP-ribosylation factor 2	1	1	93	0.0147	13.2	Up at 120hrs	CHO K1
		1	1	89	0.0078	8.2	Up at 144hrs	DP12
AGRN	agrin-like isoform 1	1	1	55	0.0137	2.7	Down at 120hrs	CHO K1
		2	2	128	0.0169	7.8	Down at 144hrs	DP12

AARS	Alanyl-tRNA synthetase, cytoplasmic	1	1	41	0.0277	3.6	Up at 120hrs	CHO K1
		2	2	113	0.0015	144.0	Up at 144hrs	DP12
AKR1A1	Alcohol dehydrogenase (NADP+)	2	2	143	0.0107	2.0	Up at 120hrs	CHO K1
		2	2	90	0.0003	10.2	Up at 144hrs	DP12
ADH5	Alcohol dehydrogenase class-3	2	2	189	0.0073	27.8	Up at 120hrs	CHO K1
		2	2	139	0.0002	23.1	Up at 144hrs	DP12
AKR1B1	Aldose reductase	4	4	213	0.0016	4.3	Up at 120hrs	CHO K1
		1	1	65	0.0012	75.1	Up at 144hrs	DP12
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	41	0.0415	21.7	Down at 120hrs	CHO K1
		1	1	50	0.0205	5.6	Up at 144hrs	DP12
ACTN1	Alpha-actinin-1	1	1	77	0.0034	4.2	Up at 120hrs	CHO K1
		6	5	354	0.0001	8.7	Up at 144hrs	DP12
ACTN4**	Alpha-actinin-4	1	1	81	0.0051	5.0	Up at 120hrs	CHO K1
		3	2	206	1.27E-05	28.5	Up at 144hrs	DP12
ANXA1	Annexin A1	1	1	45	0.0117	3.4	Up at 120hrs	CHO K1
		1	1	72	0.0012	5.4	Up at 144hrs	DP12
ANXA5	Annexin A5	1	1	43	0.0388	2.5	Up at 120hrs	CHO K1
		2	2	141	1.52E-05	12.1	Up at 144hrs	DP12
GOT1	aspartate aminotransferase, cytoplasmic	1	1	83	0.0321	3.0	Up at 120hrs	CHO K1
		2	2	89	0.0006	9.9	Up at 144hrs	DP12
GLB1	Beta-galactosidase	2	2	133	0.0181	1.8	Down at 120hrs	CHO K1
		3	3	219	0.0067	2.6	Down at 144hrs	DP12
BMP1	bone morphogenetic protein 1	1	1	41	0.0312	12.5	Up at 120hrs	CHO K1
		3	3	151	0.0278	2.7	Up at 144hrs	DP12
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	5	5	358	0.0022	2.4	Up at 120hrs	CHO K1
		4	4	200	0.0001	14.7	Up at 144hrs	DP12
CLSTN1	Calsyntenin-1	1	1	58	0.0182	6.1	Up at 120hrs	CHO K1
		2	2	99	0.0024	273.9	Up at 144hrs	DP12
CAT	Catalase	1	1	51	0.0103	2.1	Up at 120hrs	CHO K1
		2	2	141	0.0001	9.6	Up at 144hrs	DP12
CDC42	Cell division control protein 42 homolog	1	1	55	0.0026	13.6	Up at 120hrs	CHO K1
		1	1	59	0.0057	160.9	Up at 144hrs	DP12

CLIC1	Chloride intracellular channel protein 1	1	1	74	0.0266	2.7	Up at 120hrs	CHO K1
		2	2	125	0.0002	5.3	Up at 144hrs	DP12
CSPG4	chondroitin sulfate proteoglycan 4	1	1	50	0.0464	11.6	Down at 120hrs	CHO K1
		1	1	68	0.0071	48.7	Up at 144hrs	DP12
CLTC	Clathrin heavy chain 1	1	1	56	0.0042	5.5	Up at 120hrs	CHO K1
		1	1	51	0.0029	11.4	Up at 144hrs	DP12
CLU	Clusterin	3	3	212	0.0087	3.3	Up at 120hrs	CHO K1
		2	2	89	0.0070	4.0	Up at 144hrs	DP12
CCDC8	coiled-coil domain-containing protein 80-like	3	3	155	0.0169	2.3	Down at 120hrs	CHO K1
		3	3	152	0.0424	2.0	Up at 144hrs	DP12
COL6A1	Collagen alpha-1(VI) chain	1	1	42	0.0028	5.1	Down at 120hrs	CHO K1
		1	1	65	0.0197	2.6	Down at 144hrs	DP12
COL5A2	collagen alpha-2(V) chain	2	2	121	0.0028	2.4	Up at 120hrs	CHO K1
		1	1	60	0.0354	1.9	Down at 144hrs	DP12
C1ra	Complement C1r-A subcomponent	3	3	179	0.0044	6.9	Down at 120hrs	CHO K1
		2	2	119	0.0001	8.3	Down at 144hrs	DP12
CORO1B	coronin-1B	1	1	67	0.0062	2.7	Up at 120hrs	CHO K1
		2	2	112	0.0001	24.4	Up at 144hrs	DP12
CRIP2	Cysteine-rich protein 2	1	1	45	0.0022	9.9	Up at 120hrs	CHO K1
		1	1	58	0.0009	6.4	Up at 144hrs	DP12
DCN	Decorin	1	1	42	0.0437	20.2	Up at 120hrs	CHO K1
		1	1	57	0.0001	259.8	Up at 144hrs	DP12
DSTN	Destrin	1	1	67	0.0322	2.0	Up at 120hrs	CHO K1
		1	1	72	0.0012	9.0	Up at 144hrs	DP12
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	1	1	49	0.0271	3.3	Up at 120hrs	CHO K1
		2	2	96	0.0065	2.9	Up at 144hrs	DP12
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	63	0.0496	2.8	Up at 120hrs	CHO K1
		1	1	52	0.0111	1.9	Up at 144hrs	DP12
EFHD2	EF-hand domain-containing protein D2	1	1	84	0.0253	2.8	Up at 120hrs	CHO K1
		1	1	74	8.81E-06	6.2	Up at 144hrs	DP12
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	3	3	150	0.0037	35.8	Up at 120hrs	CHO K1
		2	2	128	0.0130	2.6	Up at 144hrs	DP12

EEF1D	Elongation factor 1-delta	2	2	191	0.0048	3.9	Up at 120hrs	CHO K1
		2	2	159	0.0005	24.4	Up at 144hrs	DP12
EEF1G	elongation factor 1-gamma	2	2	149	0.0408	2.8	Up at 120hrs	CHO K1
		5	5	274	0.0020	11.4	Up at 144hrs	DP12
EEF2	elongation factor 2	5	4	249	0.0442	1.6	Down at 120hrs	CHO K1
		3	3	149	0.0014	5.7	Up at 144hrs	DP12
HSP90B1	endoplasmin	2	2	104	0.0008	2.4	Up at 120hrs	CHO K1
		3	3	148	3.17E-05	9.3	Up at 144hrs	DP12
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	1	1	80	0.0149	3.0	Up at 120hrs	CHO K1
		2	2	114	0.0003	3.4	Up at 144hrs	DP12
CAPZB	F-actin-capping protein subunit beta	2	2	123	0.0086	3.4	Up at 120hrs	CHO K1
		1	1	94	3.50E-06	15.8	Up at 144hrs	DP12
FASN	Fatty acid synthase	1	1	53	0.0122	3.0	Up at 120hrs	CHO K1
		1	1	76	0.0003	4.1	Up at 144hrs	DP12
FTH1	Ferritin heavy chain	1	1	46	0.0470	2.1	Up at 120hrs	CHO K1
		4	4	197	0.0001	4.4	Up at 144hrs	DP12
FN1	Fibronectin	3	3	255	0.0423	1.9	Down at 120hrs	CHO K1
		3	3	130	0.0128	5.0	Up at 144hrs	DP12
BLVRB	Flavin reductase	1	1	43	0.0040	3.2	Up at 120hrs	CHO K1
		1	1	47	0.0028	31.2	Up at 144hrs	DP12
LGALS3	Galectin-3	2	2	103	0.0094	12.1	Up at 120hrs	CHO K1
		2	2	104	8.04E-06	23.1	Up at 144hrs	DP12
G6PD	Glucose-6-phosphate 1-dehydrogenase	1	1	57	0.0025	4.7	Up at 120hrs	CHO K1
		2	2	97	0.0018	18.2	Up at 144hrs	DP12
PRKCSH	Glucosidase 2 subunit beta	1	1	48	0.0490	2.5	Up at 120hrs	CHO K1
		2	2	117	0.0002	10.2	Up at 144hrs	DP12
RAN	GTP-binding nuclear protein Ran	2	2	152	0.0328	4.6	Up at 120hrs	CHO K1
		1	1	42	0.0077	21.8	Up at 144hrs	DP12
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	4	4	248	0.0027	3.2	Up at 120hrs	CHO K1
		2	2	94	0.0014	16.5	Up at 144hrs	DP12
HSPA13	Heat shock 70 kDa protein 13	1	1	43	0.0201	2.9	Down at 120hrs	CHO K1
		1	1	75	0.0312	2.8	Up at 144hrs	DP12

HNRPDL	Heterogeneous nuclear ribonucleoprotein D-like	1	1	57	0.0330	6.5	Up at 120hrs	CHO K1
		1	1	51	0.0028	7.8	Up at 144hrs	DP12
RBMX	Heterogeneous nuclear ribonucleoprotein G	1	1	50	0.0161	3.6	Up at 120hrs	CHO K1
		1	1	42	0.0009	5.6	Up at 144hrs	DP12
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	1	1	61	0.0189	4.7	Up at 120hrs	CHO K1
		3	3	208	2.63E-05	8.1	Up at 144hrs	DP12
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	1	1	79	0.0363	1.9	Up at 120hrs	CHO K1
		2	2	122	0.0010	4.2	Up at 144hrs	DP12
H1F0	Histone H1.0	1	1	93	0.0012	5.0	Up at 120hrs	CHO K1
		1	1	44	0.0076	116.1	Up at 144hrs	DP12
H3F3A	Histone H3.3	1	1	57	0.0093	2.7	Up at 120hrs	CHO K1
		1	1	44	0.0033	32.0	Up at 144hrs	DP12
CDC37	Hsp90 co-chaperone Cdc37	1	1	58	0.0155	2.3	Up at 120hrs	CHO K1
		2	2	96	8.69E-06	34.7	Up at 144hrs	DP12
HPRT1	Hypoxanthine-guanine phosphoribosyltransferase	1	1	41	0.0432	2.4	Up at 120hrs	CHO K1
		1	1	69	0.0005	13.5	Up at 144hrs	DP12
KPNB1	Importin subunit beta-1	3	3	201	0.0007	3.1	Up at 120hrs	CHO K1
		2	2	130	0.0006	24.1	Up at 144hrs	DP12
PPA1	Inorganic pyrophosphatase	1	1	64	0.0144	12.7	Up at 120hrs	CHO K1
		1	1	47	0.0082	2.8	Up at 144hrs	DP12
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	2	2	119	0.0081	2.9	Up at 120hrs	CHO K1
		3	3	197	0.0255	1.9	Down at 144hrs	DP12
ILF3	Interleukin enhancer-binding factor 3	1	1	83	0.0006	3.5	Up at 120hrs	CHO K1
		2	2	91	0.0009	27.5	Up at 144hrs	DP12
GLO1	Lactoylglutathione lyase	1	1	54	0.0188	3.2	Up at 120hrs	CHO K1
		1	1	43	0.0005	11.9	Up at 144hrs	DP12
LMNA	Lamin-A/C	3	3	208	0.0010	4.0	Up at 120hrs	CHO K1
		9	9	663	0.0006	8.5	Up at 144hrs	DP12
LMNB1	Lamin-B1	1	1	64	0.0349	1.6	Up at 120hrs	CHO K1
		1	1	55	0.0039	16.5	Up at 144hrs	DP12
LAMC1	laminin subunit gamma-1	2	2	137	0.0427	1.7	Down at 120hrs	CHO K1
		2	2	110	0.0087	4.6	Down at 144hrs	DP12

LDHA	L-lactate dehydrogenase A chain	2	2	113	0.0384	14.2	Up at 120hrs	CHO K1
		2	2	124	0.0001	20.3	Up at 144hrs	DP12
MIF	Macrophage migration inhibitory factor	1	1	76	0.0061	2.9	Up at 120hrs	CHO K1
		2	2	127	0.0157	124.0	Up at 144hrs	DP12
CAPG	Macrophage-capping protein	2	2	164	0.0002	3.3	Up at 120hrs	CHO K1
		2	2	138	0.0002	13.8	Up at 144hrs	DP12
MDH1	Malate dehydrogenase, cytoplasmic	3	3	232	0.0264	8.1	Up at 120hrs	CHO K1
		2	2	83	0.0013	10.0	Up at 144hrs	DP12
EPDR1	Mammalian ependymin-related protein 1	2	2	148	0.0001	7.1	Down at 120hrs	CHO K1
		2	2	118	0.0004	3.4	Down at 144hrs	DP12
MMP9	matrix metalloproteinase-9	1	1	90	0.0168	3.3	Down at 120hrs	CHO K1
		4	4	269	0.0002	7.6	Down at 144hrs	DP12
MSN	moesin	2	2	118	0.0283	2.4	Up at 120hrs	CHO K1
		4	3	300	0.0003	18.4	Up at 144hrs	DP12
MYL6	Myosin light polypeptide 6	1	1	42	0.0069	2.4	Up at 120hrs	CHO K1
		1	1	61	0.0019	25.5	Up at 144hrs	DP12
GNS	N-acetylglucosamine-6-sulfatase	1	1	49	0.0164	3.1	Down at 120hrs	CHO K1
		1	1	63	0.0042	2.2	Down at 144hrs	DP12
NEO1	Neogenin	1	1	47	0.0373	2.5	Up at 120hrs	CHO K1
		2	2	113	0.0010	2.5	Up at 144hrs	DP12
NCAM1	Neural cell adhesion molecule 1	3	3	191	0.0147	3.5	Up at 120hrs	CHO K1
		3	3	199	0.0006	12.8	Up at 144hrs	DP12
AHNAK	Neuroblast differentiation-associated protein AHNAK	3	3	167	0.0052	4.4	Up at 120hrs	CHO K1
		1	1	49	1.28E-05	11.6	Up at 144hrs	DP12
NHP2L1	NHP2-like protein 1	1	1	67	0.0001	5.4	Up at 120hrs	CHO K1
		1	1	62	0.0008	15.3	Up at 144hrs	DP12
NSFL1C	NSFL1 cofactor p47	1	1	98	0.0043	2.4	Up at 120hrs	CHO K1
		4	4	227	2.74E-05	7.3	Up at 144hrs	DP12
NUCB1	Nucleobindin-1	2	2	135	0.0088	2.2	Up at 120hrs	CHO K1
		2	1	103	0.0007	3.1	Up at 144hrs	DP12
NCL	nucleolin	1	1	41	0.0100	2.4	Up at 120hrs	CHO K1
		2	2	106	0.0004	7.5	Up at 144hrs	DP12

NME1	Nucleoside diphosphate kinase A	2	2	134	0.0159	5.2	Up at 120hrs	CHO K1
		2	1	95	0.0001	4.7	Up at 144hrs	DP12
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	1	1	56	0.0407	2.2	Up at 120hrs	CHO K1
		1	1	44	0.0017	4.6	Up at 144hrs	DP12
PRDX1	Peroxiredoxin-1	3	3	139	0.0234	3.4	Up at 120hrs	CHO K1
		2	2	87	0.0006	9.9	Up at 144hrs	DP12
PEBP1	Phosphatidylethanolamine-binding protein 1	1	1	51	0.0358	2.5	Up at 120hrs	CHO K1
		1	1	47	0.0008	22.0	Up at 144hrs	DP12
PGM1	Phosphoglucomutase-1	1	1	86	0.0115	2.4	Up at 120hrs	CHO K1
		1	1	84	0.0012	99.5	Up at 144hrs	DP12
PGM2	phosphoglucomutase-2	2	2	115	0.0052	2.3	Up at 120hrs	CHO K1
		1	1	80	0.0001	15.5	Up at 144hrs	DP12
PGK1	phosphoglycerate kinase 1	2	2	116	0.0027	2.5	Up at 120hrs	CHO K1
		2	2	94	0.0006	5.5	Up at 144hrs	DP12
PGAM1	Phosphoglycerate mutase 1	2	2	96	0.0215	2.7	Up at 120hrs	CHO K1
		3	3	179	0.0007	13.3	Up at 144hrs	DP12
PLTP	phospholipid transfer protein	3	3	185	0.0053	4.8	Up at 120hrs	CHO K1
		3	3	150	0.0026	2.5	Up at 144hrs	DP12
PSAT1	Phosphoserine aminotransferase	6	6	359	0.0059	4.6	Up at 120hrs	CHO K1
		1	1	48	0.0417	58.7	Up at 144hrs	DP12
SERPINF1	Pigment epithelium-derived factor	8	8	424	0.0028	6.5	Up at 120hrs	CHO K1
		2	2	110	0.0021	3.9	Up at 144hrs	DP12
PLA2G7	Platelet-activating factor acetylhydrolase	1	1	77	0.0006	7.1	Down at 120hrs	CHO K1
		3	3	194	0.0095	3.5	Down at 144hrs	DP12
PLEC	Plectin	2	2	90	0.0135	4.7	Up at 120hrs	CHO K1
		3	2	146	0.0008	61.5	Up at 144hrs	DP12
PABPC1	Polyadenylate-binding protein 1	2	2	143	0.0025	2.1	Up at 120hrs	CHO K1
		1	1	61	0.0003	6.0	Up at 144hrs	DP12
PFN1	Profilin-1	1	1	63	0.0243	1.9	Up at 120hrs	CHO K1
		1	1	41	0.0043	57.1	Up at 144hrs	DP12
PCNA	Proliferating cell nuclear antigen	2	2	92	0.0042	1.9	Up at 120hrs	CHO K1
		1	1	56	4.17E-05	4.6	Up at 144hrs	DP12
PA2G4	Proliferation-associated protein 2G4	1	1	84	0.0156	2.2	Up at 120hrs	CHO K1

		5	5	315	0.0008	9.1	Up at 144hrs	DP12
PSME2	proteasome activator complex subunit 2-like isoform 1	1	1	51	0.0054	9.3	Up at 120hrs	CHO K1
		2	2	156	0.0002	7.1	Up at 144hrs	DP12
PSMA3	Proteasome subunit alpha type-3	1	1	46	0.0279	2.1	Up at 120hrs	CHO K1
		1	1	75	0.0084	11.4	Up at 144hrs	DP12
PSMB1	Proteasome subunit beta type-1	1	1	48	0.0177	2.5	Up at 120hrs	CHO K1
		1	1	65	0.0178	6.8	Up at 144hrs	DP12
PSMB6	Proteasome subunit beta type-6	1	1	87	0.0247	2.3	Up at 120hrs	CHO K1
		3	3	173	0.0084	10.2	Up at 144hrs	DP12
CYR61	Protein CYR61	1	1	61	0.0164	2.5	Down at 120hrs	CHO K1
		1	1	44	0.0144	5.9	Down at 144hrs	DP12
PDIA4	protein disulfide-isomerase A4	1	1	88	0.0127	3.8	Up at 120hrs	CHO K1
		3	3	155	0.0001	7.4	Up at 144hrs	DP12
PNP	Purine nucleoside phosphorylase	1	1	68	0.0190	2.7	Up at 120hrs	CHO K1
		3	3	182	1.94E-05	4.9	Up at 144hrs	DP12
PLBD2	putative phospholipase B-like 2	1	1	46	0.0099	3.4	Up at 120hrs	CHO K1
		1	1	45	0.0062	2.6	Up at 144hrs	DP12
PDXK	Pyridoxal kinase	1	1	62	0.0027	2.1	Up at 120hrs	CHO K1
		1	1	67	0.0083	20.9	Up at 144hrs	DP12
PKM	Pyruvate kinase isozymes M1/M2	5	5	345	0.0193	2.7	Up at 120hrs	CHO K1
		6	6	335	0.0001	6.0	Up at 144hrs	DP12
GDI2	Rab GDP dissociation inhibitor beta	1	1	43	0.0188	3.5	Up at 120hrs	CHO K1
		2	2	97	8.41E-06	7.4	Up at 144hrs	DP12
IQGAP1	Ras GTPase-activating-like protein IQGAP1	2	2	121	0.0030	3.5	Up at 120hrs	CHO K1
		1	1	45	0.0022	19.9	Up at 144hrs	DP12
RAB7A	ras-related protein Rab-7a-like	2	2	93	0.0002	8.3	Up at 120hrs	CHO K1
		1	1	47	0.0239	121.7	Up at 144hrs	DP12
PTBP3	Regulator of differentiation 1	1	1	61	0.0179	2.4	Up at 120hrs	CHO K1
		1	1	59	0.0019	9.3	Up at 144hrs	DP12
ATP6AP2	Renin receptor	4	4	202	0.0027	4.8	Up at 120hrs	CHO K1
		1	1	58	0.0036	3.9	Up at 144hrs	DP12
RPA1	Replication protein A 70 kDa DNA-binding subunit	1	1	69	0.0012	4.4	Up at 120hrs	CHO K1
		1	1	45	0.0266	27.2	Up at 144hrs	DP12

RNH1	Ribonuclease inhibitor	1	1	40	0.0120	2.7	Up at 120hrs	CHO K1
		1	1	58	0.0437	61.5	Up at 144hrs	DP12
SEMA3C	Semaphorin-3C	1	1	57	0.0013	2.4	Down at 120hrs	CHO K1
		3	3	151	0.0024	2.6	Down at 144hrs	DP12
SERPINB6	Serpin B6	1	1	80	0.0028	4.3	Up at 120hrs	CHO K1
		2	2	124	0.0008	10.0	Up at 144hrs	DP12
SH3BGRL 2	SH3 domain-binding glutamic acid-rich-like protein	1	1	94	0.0240	1.6	Up at 120hrs	CHO K1
		2	2	166	0.0005	7.9	Up at 144hrs	DP12
STIP1	Stress-induced-phosphoprotein 1	1	1	45	0.0473	10.1	Up at 120hrs	CHO K1
		1	1	49	0.0020	12.0	Up at 144hrs	DP12
Psap	sulfated glycoprotein 1	5	5	289	0.0126	7.7	Up at 120hrs	CHO K1
		2	2	91	0.0094	27.1	Up at 144hrs	DP12
SBSN	Suprabasin	3	2	243	0.0078	6.0	Up at 120hrs	CHO K1
		6	6	466	0.0022	2.5	Up at 144hrs	DP12
VAT1	Synaptic vesicle membrane protein VAT-1 homolog	1	1	97	0.0430	1.8	Up at 120hrs	CHO K1
		1	1	57	0.0265	118.0	Up at 144hrs	DP12
TCP1	T-complex protein 1 subunit alpha	3	3	150	0.0054	5.7	Up at 120hrs	CHO K1
		2	2	112	0.0400	66.6	Up at 144hrs	DP12
CCT2	T-complex protein 1 subunit beta	2	2	151	0.0288	2.7	Up at 120hrs	CHO K1
		3	3	186	0.0004	5.3	Up at 144hrs	DP12
CCT5	T-complex protein 1 subunit epsilon	3	3	182	0.0052	2.4	Up at 120hrs	CHO K1
		2	2	139	0.0123	25.9	Up at 144hrs	DP12
CCT7	T-complex protein 1 subunit eta	2	2	175	0.0053	4.6	Up at 120hrs	CHO K1
		4	4	254	0.0010	8.3	Up at 144hrs	DP12
CCT3	T-complex protein 1 subunit gamma	1	1	51	0.0072	2.0	Up at 120hrs	CHO K1
		4	4	233	0.0013	5.2	Up at 144hrs	DP12
CCT8	T-complex protein 1 subunit theta	1	1	82	0.0059	2.7	Up at 120hrs	CHO K1
		1	1	80	0.0019	6.3	Up at 144hrs	DP12
CCT8	T-complex protein 1 subunit theta	1	1	49	0.0269	3.2	Up at 120hrs	CHO K1
		2	2	108	0.0018	23.0	Up at 144hrs	DP12
THBS1	thrombospondin-1	3	3	168	0.0142	5.1	Up at 120hrs	CHO K1
		5	5	266	0.0006	9.5	Down at 144hrs	DP12
TALDO1	transaldolase	3	3	134	0.0002	4.3	Up at 120hrs	CHO K1

		5	5	329	0.0003	21.7	Up at 144hrs	DP12
TAGLN2	Transgelin-2	4	4	288	0.0013	4.9	Up at 120hrs	CHO K1
		4	4	245	4.59E-05	14.2	Up at 144hrs	DP12
VCP	Transitional endoplasmic reticulum ATPase	2	2	103	0.0335	1.8	Up at 120hrs	CHO K1
		7	7	490	0.0001	5.8	Up at 144hrs	DP12
TM6SF2	Transmembrane 6 superfamily member 2	1	1	68	0.0025	2.3	Up at 120hrs	CHO K1
		1	1	53	0.0009	4.0	Up at 144hrs	DP12
TPI1	Triosephosphate isomerase	4	4	343	0.0089	4.2	Up at 120hrs	CHO K1
		5	4	366	2.46E-05	25.7	Up at 144hrs	DP12
TINAGL1	Tubulointerstitial nephritis antigen-like	1	1	57	0.0008	6.2	Up at 120hrs	CHO K1
		1	1	57	0.0020	7.4	Up at 144hrs	DP12
UBE2K	Ubiquitin-conjugating enzyme E2 K	1	1	51	0.0072	3.2	Up at 120hrs	CHO K1
		1	1	58	0.0038	4.8	Up at 144hrs	DP12
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	1	1	41	0.0404	3.1	Up at 120hrs	CHO K1
		1	1	56	1.42E-05	8.9	Up at 144hrs	DP12
UBA1	Ubiquitin-like modifier-activating enzyme 1	2	2	129	0.0034	2.2	Up at 120hrs	CHO K1
		1	1	67	0.0006	6.2	Up at 144hrs	DP12
UGDH	UDP-glucose 6-dehydrogenase	4	4	331	0.0087	2.9	Up at 120hrs	CHO K1
		4	4	254	0.0001	5.6	Up at 144hrs	DP12
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0066	2.6	Down at 120hrs	CHO K1
		1	1	52	2.04E-05	13.7	Up at 144hrs	DP12
VIM	vimentin	4	4	215	0.0022	3.4	Up at 120hrs	CHO K1
		9	9	488	4.67E-05	10.5	Up at 144hrs	DP12
VCL	Vinculin	5	5	358	0.0010	2.3	Up at 120hrs	CHO K1
		3	3	182	0.0001	18.4	Up at 144hrs	DP12
PROS1	vitamin K-dependent protein S	5	5	266	0.0048	2.9	Down at 120hrs	CHO K1
		1	1	58	0.0393	3.1	Down at 144hrs	DP12
WDR1	WD repeat-containing protein 1	2	2	155	0.0053	2.6	Up at 120hrs	CHO K1
		1	1	71	0.0262	132.5	Up at 144hrs	DP12

Table 3.3.25: Table of differentially expressed proteins common to a CHO K1 and DP12 cell line when 24hrs is compared to 120hrs (CHO K1) / 144hrs (DP12) at 31C.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Direction of fold change	Cell line
YWHAH	14-3-3 protein eta	1	1	49	0.0098	1.7	Down at 120hrs	CHO K1
		2	1	88	0.0001	81.1	Up at 144hrs	DP12
RPS15A	40S ribosomal protein S15a	1	1	64	0.0202	1.9	Up at 120hrs	CHO K1
		1	1	44	0.0002	3.7	Up at 144hrs	DP12
RPL9	60S ribosomal protein L9	1	1	58	0.0087	2.0	Up at 120hrs	CHO K1
		1	1	65	0.0167	1.8	Up at 144hrs	DP12
HSPA5	78 kDa glucose-regulated protein	1	1	53	0.0304	1.9	Down at 120hrs	CHO K1
		8	8	546	4.01E-05	19.7	Up at 144hrs	DP12
IDUA	Alpha-L-iduronidase	1	1	44	0.0306	2.5	Up at 120hrs	CHO K1
		4	4	248	4.71E-05	3.1	Up at 144hrs	DP12
NAGLU	alpha-N-acetylglucosaminidase-like	3	3	162	0.0037	6.7	Up at 120hrs	CHO K1
		3	3	212	1.27E-05	12.7	Up at 144hrs	DP12
APP	amyloid beta A4 protein	1	1	49	0.0004	Infinity	Down at 120hrs	CHO K1
		2	2	107	1.71E-05	3.4	Up at 144hrs	DP12
APLP2	Amyloid-like protein 2	1	1	60	0.0287	11.4	Up at 120hrs	CHO K1
		3	3	231	0.0004	1.6	Down at 144hrs	DP12
ANXA2	Annexin A2	1	1	58	0.0311	34.6	Up at 120hrs	CHO K1
		1	1	53	0.0056	12.5	Up at 144hrs	DP12
ATXN10	Ataxin-10	1	1	72	0.0207	3.4	Up at 120hrs	CHO K1
		1	1	87	0.0012	13.6	Up at 144hrs	DP12
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	2	2	164	0.0070	4.0	Up at 120hrs	CHO K1
		5	5	254	0.0022	1.6	Up at 144hrs	DP12
CTSD	cathepsin D	3	3	250	0.0040	3.1	Up at 120hrs	CHO K1
		1	1	43	0.0006	35.3	Up at 144hrs	DP12
CIRBP	Cold-inducible RNA-binding protein	1	1	60	0.0154	3.5	Up at 120hrs	CHO K1
		1	1	51	0.0004	30.4	Up at 144hrs	DP12
C1ra	Complement C1r-A subcomponent	3	3	179	0.0025	4.2	Down at 120hrs	CHO K1

		2	2	134	0.0019	4.5	Down at 144hrs	DP12
PHGDH	d-3-phosphoglycerate dehydrogenase-like	1	1	77	0.0222	2.5	Up at 120hrs	CHO K1
		3	3	197	1.46E-06	17.5	Up at 144hrs	DP12
HSP90B1	endoplasmin	2	2	131	0.0190	1.8	Down at 120hrs	CHO K1
		6	4	314	2.05E-05	21.1	Up at 144hrs	DP12
GSTP1	Glutathione S-transferase P	1	1	106	0.0023	12.1	Down at 120hrs	CHO K1
		1	1	42	0.0010	3.1	Up at 144hrs	DP12
GPC1	Glypican-1	1	1	45	0.0403	275.1	Down at 120hrs	CHO K1
		1	1	65	0.0015	3.7	Down at 144hrs	DP12
GRN	granulins isoform 1	1	1	60	0.0000	5.5	Up at 120hrs	CHO K1
		1	1	48	0.0067	11.6	Up at 144hrs	DP12
RAN	GTP-binding nuclear protein Ran	1	1	47	0.0007	Infinity	Down at 120hrs	CHO K1
		2	2	85	0.0094	4.3	Up at 144hrs	DP12
HSP90AB1	heat shock protein HSP 90-beta-like	3	2	180	0.0008	2.3	Down at 120hrs	CHO K1
		3	2	155	0.0012	3.8	Up at 144hrs	DP12
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	1	1	43	0.0274	2.3	Up at 120hrs	CHO K1
		2	2	114	2.50E-06	8.6	Up at 144hrs	DP12
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	1	1	71	0.0053	2.5	Up at 120hrs	CHO K1
		2	2	125	0.0023	18.8	Up at 144hrs	DP12
HYOU1	Hypoxia up-regulated protein 1	2	2	106	0.0040	3.3	Down at 120hrs	CHO K1
		2	2	127	0.0009	5.0	Up at 144hrs	DP12
MFGE8	Lactadherin	3	3	172	0.0085	3.0	Up at 120hrs	CHO K1
		2	2	94	0.0006	1.6	Down at 144hrs	DP12
LMNA	Lamin-A/C	1	1	59	0.0090	2.7	Up at 120hrs	CHO K1
		6	6	370	1.71E-05	9.5	Up at 144hrs	DP12
MSN	moesin	2	1	169	0.0265	2.2	Up at 120hrs	CHO K1
		10	10	551	2.07E-05	5.3	Up at 144hrs	DP12
MYL6	Myosin light polypeptide 6	1	1	42	0.0292	3.1	Up at 120hrs	CHO K1
		1	1	61	0.0013	22.3	Up at 144hrs	DP12
AHNAK**	Neuroblast differentiation-associated protein AHNAK	8	8	474	0.0057	4.1	Up at 120hrs	CHO K1
		1	1	45	0.0004	11.5	Up at 144hrs	DP12
NCL	nucleolin	1	1	60	0.0083	1.6	Up at 120hrs	CHO K1

		2	2	91	0.0018	12.9	Up at 144hrs	DP12
PGK1	phosphoglycerate kinase 1	1	1	67	0.0151	1.6	Up at 120hrs	CHO K1
		1	1	51	0.0013	23.9	Up at 144hrs	DP12
PLA2G7	platelet-activating factor acetylhydrolase-like	2	2	128	0.0041	5.4	Down at 120hrs	CHO K1
		2	1	122	0.0019	4.5	Up at 144hrs	DP12
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	54	0.0081	Infinity	Up at 120hrs	CHO K1
		1	1	43	0.0086	2.7	Down at 144hrs	DP12
PSME2	proteasome activator complex subunit 2-like isoform 1	2	2	101	0.0179	2.0	Up at 120hrs	CHO K1
		1	1	53	0.0016	4.4	Up at 144hrs	DP12
PSMB1	Proteasome subunit beta type-1	1	1	48	0.0136	1.8	Up at 120hrs	CHO K1
		2	2	155	0.0001	9.2	Up at 144hrs	DP12
Ctla2b	protein CTLA-2-beta-like	2	2	125	0.0034	8.2	Up at 120hrs	CHO K1
		1	1	50	0.0001	6.3	Up at 144hrs	DP12
PDIA3	Protein disulfide-isomerase A3	1	1	69	0.0174	1.6	Down at 120hrs	CHO K1
		4	4	221	0.0001	16.3	Up at 144hrs	DP12
RBM3	Putative RNA-binding protein 3	1	1	47	0.0078	4.2	Up at 120hrs	CHO K1
		1	1	66	0.0185	165.6	Up at 144hrs	DP12
PKM	Pyruvate kinase isozymes M1/M2	3	3	187	0.0034	4.8	Down at 120hrs	CHO K1
		5	5	353	0.0004	3.5	Up at 144hrs	DP12
RAB7A	ras-related protein Rab-7a-like	2	2	93	0.0031	4.5	Up at 120hrs	CHO K1
		2	2	129	3.01E-06	13.7	Up at 144hrs	DP12
SFPQ	splicing factor, proline- and glutamine-rich	1	1	72	0.0004	4.8	Up at 120hrs	CHO K1
		2	2	122	0.0007	6.0	Up at 144hrs	DP12
Psap	sulfated glycoprotein 1	1	1	43	0.0477	5.1	Up at 120hrs	CHO K1
		3	3	147	0.0090	38.0	Up at 144hrs	DP12
SBSN	Suprabasin	3	3	236	0.0122	6.1	Up at 120hrs	CHO K1
		4	4	242	0.0443	1.8	Up at 144hrs	DP12
CCT7	T-complex protein 1 subunit eta	1	1	51	0.0034	3.6	Up at 120hrs	CHO K1
		1	1	61	0.0026	2.4	Up at 144hrs	DP12
TGFB1	Transforming growth factor beta-1	1	1	67	0.0010	1.9	Down at 120hrs	CHO K1
		1	1	71	0.0025	1.6	Down at 144hrs	DP12
VCP	Transitional endoplasmic reticulum ATPase	2	2	100	0.0268	1.9	Up at 120hrs	CHO K1

		8	8	441	0.0004	7.8	Up at 144hrs	DP12
TPM3	tropomyosin alpha-3 chain isoform 1	1	1	42	0.0466	1.7	Up at 120hrs	CHO K1
		4	4	211	0.0006	8.6	Up at 144hrs	DP12
D17Wsu104e	UPF0556 protein C19orf10 homolog	1	1	49	0.0083	2.0	Down at 120hrs	CHO K1
		1	1	47	0.0330	471.3	Up at 144hrs	DP12
VIM	vimentin	4	4	224	0.0146	2.4	Up at 120hrs	CHO K1
		9	9	471	2.16E-05	14.6	Up at 144hrs	DP12
VCL	Vinculin	5	5	366	0.0022	2.1	Up at 120hrs	CHO K1
		2	2	107	0.0026	12.5	Up at 144hrs	DP12

Table 3.3.26: Table of differentially expressed proteins common to a CHO K1 and DP12 cell line when 37C is compared to 31C at 24hrs.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Direction of fold change	Cell Line
ACTN1	Alpha-actinin-1	3	2	181	0.0031	2.4	Up at 31C	CHO K1
		2	2	162	0.0199	2.2	Up at 31C	DP12
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	1	1	54	0.0002	5.9	Down at 31C	CHO K1
		10	10	600	0.0050	2.9	Down at 31C	DP12
HEXA	beta-hexosaminidase subunit alpha	1	1	42	0.0341	1.6	Down at 31C	CHO K1
		2	2	101	0.0096	2.2	Down at 31C	DP12
CLU	Clusterin	1	1	46	0.0485	1.8	Down at 31C	CHO K1
		3	3	207	0.0036	2.5	Down at 31C	DP12
EEF2	elongation factor 2	1	1	57	0.0404	2.1	Up at 31C	CHO K1
		2	2	123	0.0130	2.2	Up at 31C	DP12
BLVRB	Flavin reductase	1	1	68	0.0176	8.5	Up at 31C	CHO K1
		1	1	57	0.0453	5.9	Up at 31C	DP12
HSP90AB 1	heat shock protein HSP 90-beta-like	6	3	380	0.0011	1.8	Up at 31C	CHO K1
		1	1	80	0.0054	1.6	Up at 31C	DP12
HYOU1	Hypoxia up-regulated protein 1	2	2	106	0.0018	4.2	Up at 31C	CHO K1
		2	2	124	0.0138	1.7	Down at 31C	DP12
KPNB1	Importin subunit beta-1	2	2	105	0.0228	2.5	Up at 31C	CHO K1
		1	1	63	0.0106	2.5	Up at 31C	DP12
EPDR1	Mammalian ependymin-related protein 1	1	1	79	0.0360	1.8	Down at 31C	CHO K1
		2	2	126	0.0093	2.6	Down at 31C	DP12
MMP19	matrix metalloproteinase-19	1	1	45	0.0213	1.6	Down at 31C	CHO K1
		2	2	87	0.0257	1.8	Down at 31C	DP12
NUCB1	Neuroblast differentiation-associated protein AHNAK	1	1	48	0.0257	2.0	Up at 31C	CHO K1
		2	2	125	0.0139	3.1	Down at 31C	DP12
NUCB1	Neuroblast differentiation-associated protein AHNAK	1	1	61	0.0176	3.4	Up at 31C	CHO K1
		1	1	55	0.0105	4.4	Down at 31C	DP12
PGK1	phosphoglycerate kinase 1	2	2	116	0.0012	2.1	Up at 31C	CHO K1
		1	1	98	0.0364	2.9	Up at 31C	DP12

SERPINF1	Pigment epithelium-derived factor	1	1	53	0.0005	2.2	Up at 31C	CHO K1
		2	2	105	0.0204	2.5	Down at 31C	DP12
PLS3	Plastin-3	1	1	94	0.0475	1.6	Up at 31C	CHO K1
		1	1	42	0.0158	3.0	Up at 31C	DP12
PABPC1	Polyadenylate-binding protein 1	2	2	168	0.0011	2.0	Up at 31C	CHO K1
		1	1	49	0.0045	1.6	Up at 31C	DP12
PTGR1	Prostaglandin reductase 1	2	1	105	0.0019	2.0	Up at 31C	CHO K1
		2	2	136	0.0122	2.2	Up at 31C	DP12
PKM	Pyruvate kinase isozymes M1/M2	2	2	149	0.0319	1.5	Up at 31C	CHO K1
		3	3	176	0.0026	1.8	Up at 31C	DP12
Psap	sulfated glycoprotein 1	2	2	137	0.0357	4.4	Down at 31C	CHO K1
		1	1	43	0.0241	6.2	Down at 31C	DP12

Table 3.3.27: Table of differentially expressed proteins common to a CHO K1 and DP12 cell line when 37C is compared to 31C at 120hrs (CHO K1) / 144hrs (DP12).

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Direction of fold change	Cell Line
RPS12	40S ribosomal protein S12	1	1	54	0.0076	7.8	Down at 31C	CHO K1
		1	1	44	0.0217	417.0	Down at 31C	DP12
HSPA5	78 kDa glucose-regulated protein	3	3	185	0.0191	2.9	Up at 31C	CHO K1
		3	3	179	0.0071	1.8	Up at 31C	DP12
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	1	1	41	0.0263	59.5	Up at 31C	CHO K1
		1	1	50	0.0001	1.9	Down at 31C	DP12
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	7	7	446	0.0048	4.4	Down at 31C	CHO K1
		6	6	359	0.0063	2.0	Down at 31C	DP12
BMP1	bone morphogenetic protein 1	2	2	103	0.0138	2.2	Down at 31C	CHO K1
		6	6	296	0.0006	3.0	Down at 31C	DP12
CALR	Calreticulin	1	1	53	0.0104	3.0	Up at 31C	CHO K1
		1	1	40	0.0040	2.1	Up at 31C	DP12
CLSTN1	Calsyntenin-1	2	1	142	0.0115	1.9	Down at 31C	CHO K1
		1	1	88	0.0043	2.7	Down at 31C	DP12
CLSTN1	Calsyntenin-1	5	4	281	0.0086	2.4	Down at 31C	CHO K1
		1	1	89	0.0146	3.2	Down at 31C	DP12
CSPG4	chondroitin sulfate proteoglycan 4	1	1	107	0.0232	2.6	Down at 31C	CHO K1
		2	2	106	0.0045	1.8	Down at 31C	DP12
CFL1	cofilin-1	1	1	47	0.0401	12.4	Down at 31C	CHO K1
		1	1	49	0.0491	2.2	Down at 31C	DP12
CCDC8	coiled-coil domain-containing protein 80-like	2	2	132	0.0261	2.1	Up at 31C	CHO K1
		3	3	175	0.0014	2.6	Up at 31C	DP12
COL6A1	Collagen alpha-1(VI) chain	1	1	55	0.0327	6.5	Down at 31C	CHO K1
		3	3	185	0.0223	1.9	Up at 31C	DP12
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	1	1	42	0.0151	2.3	Down at 31C	CHO K1
		1	1	52	0.0108	1.8	Down at 31C	DP12

NEDD4	E3 ubiquitin-protein ligase NEDD4	1	1	44	0.0248	4.2	Up at 31C	CHO K1
		1	1	42	0.0043	2.4	Up at 31C	DP12
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	1	1	45	0.0034	67.6	Down at 31C	CHO K1
		2	2	137	0.0094	2.4	Down at 31C	DP12
EZR	Ezrin	2	2	136	0.0108	3.1	Up at 31C	CHO K1
		1	1	72	0.0041	2.3	Up at 31C	DP12
FTH1	Ferritin heavy chain	1	1	46	0.0435	2.0	Up at 31C	CHO K1
		2	2	134	0.0056	2.7	Up at 31C	DP12
FN1	Fibronectin	5	5	268	0.0012	4.3	Down at 31C	CHO K1
		4	4	262	0.0163	1.7	Down at 31C	DP12
GRN	granulins isoform 1	1	1	79	0.0055	2888.5	Down at 31C	CHO K1
		1	1	48	0.0205	5.9	Up at 31C	DP12
HIST1H2AG	Histone H2A type 1	2	2	109	0.0119	3.8	Up at 31C	CHO K1
		2	2	115	0.0021	2.0	Up at 31C	DP12
MFGE8	Lactadherin	4	4	230	0.0031	4.4	Up at 31C	CHO K1
		3	3	166	2.17E-05	4.2	Up at 31C	DP12
LAMC1	laminin subunit gamma-1	2	2	115	0.0018	20.5	Down at 31C	CHO K1
		3	3	175	0.0251	1.6	Up at 31C	DP12
LDHA	L-lactate dehydrogenase A chain	1	1	71	0.0278	10.0	Down at 31C	CHO K1
		1	1	45	0.0001	3.0	Up at 31C	DP12
MAMDC2	MAM domain-containing protein 2	1	1	44	0.0493	2.1	Down at 31C	CHO K1
		1	1	60	0.0231	2.0	Down at 31C	DP12
MMP19	matrix metalloproteinase-19	3	3	187	0.0044	4.0	Down at 31C	CHO K1
		1	1	65	0.0111	1.8	Down at 31C	DP12
MMP9	matrix metalloproteinase-9	1	1	64	0.0198	1520.5	Down at 31C	CHO K1
		1	1	70	0.0315	1.7	Up at 31C	DP12
NEO1	Neogenin	2	2	93	0.0098	2.1	Down at 31C	CHO K1
		3	3	175	0.0015	2.2	Down at 31C	DP12
NCAM1	Neural cell adhesion molecule 1	2	2	115	0.0079	6.1	Down at 31C	CHO K1
		3	3	175	0.0007	3.8	Down at 31C	DP12
AHNAK	Neuroblast differentiation-associated protein AHNAK	4	4	249	0.0074	3.0	Up at 31C	CHO K1
		2	2	98	0.0044	2.1	Up at 31C	DP12

SERPINI1	neuroserpin-like	1	1	58	0.0020	7.1	Down at 31C	CHO K1
		1	1	58	0.0224	6.6	Down at 31C	DP12
NONO	Non-POU domain-containing octamer-binding protein	1	1	73	0.0062	2.2	Up at 31C	CHO K1
		1	1	76	0.0011	3.5	Up at 31C	DP12
OAF	out at first protein homolog	1	1	62	0.0039	2.5	Down at 31C	CHO K1
		1	1	80	0.0018	3.1	Down at 31C	DP12
PXDN	peroxidasin homolog	3	3	232	0.0019	4.5	Down at 31C	CHO K1
		4	4	212	0.0074	1.8	Down at 31C	DP12
PSAT1	Phosphoserine aminotransferase	1	1	59	0.0012	12.0	Down at 31C	CHO K1
		1	1	48	0.0026	1.8	Down at 31C	DP12
SERPINF1	Pigment epithelium-derived factor	6	6	342	0.0013	9.5	Down at 31C	CHO K1
		1	1	52	0.0004	4.1	Down at 31C	DP12
PLS3	Plastin-3	1	1	46	0.0003	Infinity	Down at 31C	CHO K1
		3	3	225	0.0001	1.5	Down at 31C	DP12
PLA2G7	Platelet-activating factor acetylhydrolase	1	1	77	0.0065	2.9	Up at 31C	CHO K1
		3	3	158	0.0097	3.1	Up at 31C	DP12
PCBP1	Poly(rC)-binding protein 1	1	1	79	0.0347	8.7	Down at 31C	CHO K1
		2	2	102	0.0016	2.9	Up at 31C	DP12
P4hb	Protein disulfide-isomerase	1	1	62	0.0407	1.9	Up at 31C	CHO K1
		1	1	56	0.0188	1.6	Up at 31C	DP12
RBM3	Putative RNA-binding protein 3	1	1	47	0.0001	51.7	Up at 31C	CHO K1
		1	1	66	0.0008	30.7	Up at 31C	DP12
PKM	Pyruvate kinase isozymes M1/M2	2	2	142	0.0064	4.6	Down at 31C	CHO K1
		1	1	55	0.0087	1.6	Up at 31C	DP12
RAB7A	ras-related protein Rab-7a-like	1	1	44	0.0452	1.7	Up at 31C	CHO K1
		4	4	216	0.0041	2.6	Up at 31C	DP12
EWSR1	RNA-binding protein EWS	1	1	60	0.0066	5.3	Up at 31C	CHO K1
		2	2	110	0.0010	2.7	Up at 31C	DP12
SEMA3E	semaphorin-3E	4	4	231	0.0012	3.0	Down at 31C	CHO K1
		1	1	77	0.0012	5.0	Down at 31C	DP12
SEMA4B	semaphorin-4B	3	3	173	0.0078	3.8	Down at 31C	CHO K1
		3	3	163	0.0105	1.8	Down at 31C	DP12

Psap	sulfated glycoprotein 1	5	5	269	0.0045	11.8	Down at 31C	CHO K1
		2	2	126	0.0231	5.0	Down at 31C	DP12
THOP1	thimet oligopeptidase-like	1	1	55	0.0209	1.8	Down at 31C	CHO K1
		2	2	104	0.0131	1.6	Down at 31C	DP12
THBS1	thrombospondin-1	3	3	152	0.0012	9.4	Down at 31C	CHO K1
		1	1	59	0.0065	1.7	Up at 31C	DP12
FUCA1	tissue alpha-L-fucosidase	1	1	67	0.0207	11.1	Down at 31C	CHO K1
		3	3	170	0.0031	2.4	Up at 31C	DP12
TGFB1	Transforming growth factor beta-1	3	3	192	0.0004	4.5	Down at 31C	CHO K1
		1	1	65	0.0005	2.5	Down at 31C	DP12
VCP	Transitional endoplasmic reticulum ATPase	2	2	115	0.0270	3.0	Down at 31C	CHO K1
		9	9	554	0.0047	1.7	Up at 31C	DP12
TM6SF2	Transmembrane 6 superfamily member 2	1	1	68	0.0258	1.5	Down at 31C	CHO K1
		1	1	53	0.0062	1.6	Down at 31C	DP12
UGDH	UDP-glucose 6-dehydrogenase	1	1	46	0.0423	22.3	Down at 31C	CHO K1
		2	2	141	4.27E-05	3.0	Up at 31C	DP12
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	1	1	76	0.0013	4.5	Up at 31C	CHO K1
		1	1	52	0.0003	3.2	Down at 31C	DP12
VIM	vimentin	1	1	64	0.0053	11.9	Up at 31C	CHO K1
		7	7	419	0.0007	1.8	Up at 31C	DP12

Table 3.3.28: List of tables containing quantitative information on proteins classified as secreted by the Uniprot protein database.

Condition	Appendix Table
Up at 144hrs when compared to 24hrs at 37˚C	Table 3.2.31
Down at 144hrs when compared to 24hrs at 37˚C	Table 3.2.32
Up at 144hrs when compared to 24hrs at 31˚C	Table 3.2.33
Down at 144hrs when compared to 24hrs at 31˚C	Table 3.2.34

Table 3.3.29: GO cellular component enrichment for differentially expressed host cell proteins identified in the conditioned media of a DP12 CHO cell line at 37˚C when 24hrs was compared to 144hrs (post temperature shift for a culture grown in parallel) analysed using quantitative label free LC/MS. An adjusted p-value of ≤0.05 (Benjamini) was used as a statistical cut off to generate the list of enriched cellular components.

Term	Gene Count	P-Value	Benjamini
cytosol	123	1.00E-39	3.60E-37
melanosome	28	3.30E-22	5.70E-20
pigment granule	28	3.30E-22	5.70E-20
cytosolic part	33	9.00E-21	1.00E-18
cytosolic ribosome	25	1.30E-19	1.20E-17
ribonucleoprotein complex	52	2.80E-17	1.60E-15
cytosolic small ribosomal subunit	18	2.60E-17	1.80E-15
ribosomal subunit	26	1.30E-15	6.10E-14
small ribosomal subunit	19	1.10E-14	4.90E-13
ribosome	27	3.80E-11	1.40E-09
membrane-bounded vesicle	44	1.20E-10	4.10E-09
vesicle	48	2.00E-10	6.20E-09
cytoplasmic membrane-bounded vesicle	42	5.30E-10	1.50E-08
endoplasmic reticulum lumen	16	1.30E-09	3.50E-08
chaperonin-containing T-complex	7	1.80E-09	4.40E-08
cytoplasmic vesicle	44	5.20E-09	1.20E-07
soluble fraction	29	7.20E-09	1.60E-07
proteasome core complex	9	1.50E-08	3.20E-07
proteasome complex	13	3.40E-08	6.60E-07
lytic vacuole	22	9.60E-08	1.80E-06
lysosome	22	9.60E-08	1.80E-06
intracellular non-membrane-bounded organelle	106	1.80E-07	3.10E-06
non-membrane-bounded organelle	106	1.80E-07	3.10E-06
vacuole	22	1.90E-06	3.10E-05
membrane-enclosed lumen	79	3.10E-06	4.80E-05
organelle lumen	77	5.40E-06	8.20E-05
platelet alpha granule lumen	9	7.40E-06	1.10E-04
ER-Golgi intermediate compartment	9	7.40E-06	1.10E-04
cytoplasmic membrane-bounded vesicle lumen	9	1.30E-05	1.80E-04
vesicle lumen	9	1.80E-05	2.30E-04
actin cytoskeleton	21	1.80E-05	2.40E-04
heterogeneous nuclear ribonucleoprotein complex	6	5.00E-05	6.10E-04
platelet alpha granule	9	7.90E-05	9.40E-04
extracellular region part	45	9.50E-05	1.10E-03
basement membrane	10	1.60E-04	1.70E-03
intracellular organelle lumen	70	1.70E-04	1.90E-03
extracellular matrix part	12	1.90E-04	2.00E-03
cortical cytoskeleton	8	2.20E-04	2.30E-03
cell surface	22	2.30E-04	2.30E-03
cytoskeleton	57	2.70E-04	2.60E-03
cytosolic large ribosomal subunit	7	3.60E-04	3.40E-03
spliceosome	12	5.40E-04	4.80E-03
extracellular matrix	21	5.30E-04	4.80E-03
extracellular region	74	7.80E-04	6.70E-03
cell fraction	45	1.20E-03	1.00E-02
large ribosomal subunit	8	1.50E-03	1.20E-02
nucleolus	32	1.80E-03	1.40E-02
secretory granule	13	2.20E-03	1.70E-02
proteinaceous extracellular matrix	18	3.40E-03	2.60E-02
cortical actin cytoskeleton	5	5.20E-03	3.80E-02
cell cortex part	8	5.10E-03	3.80E-02
eukaryotic translation initiation factor 3 complex	4	5.90E-03	4.20E-02
nuclear envelope	13	6.20E-03	4.20E-02
eukaryotic translation elongation factor 1 complex	3	6.10E-03	4.30E-02
endoplasmic reticulum part	18	7.60E-03	5.00E-02

Table 3.3.30: GO cellular component enrichment for differentially expressed host cell proteins identified in the conditioned media of a DP12 cell line at 31˚C when 24hrs was compared to 144hrs (post temperature shift) analysed using quantitative label free LC/MS. An adjusted p-value of ≤0.05 (Benjamini) was used as a statistical cut off to generate the list of enriched cellular components.

Term	Gene Count	P-Value	Benjamini
cytosol	128	1.10E-43	3.50E-41
ribonucleoprotein complex	64	2.50E-26	4.10E-24
cytosolic part	37	3.50E-25	3.90E-23
cytosolic ribosome	28	1.80E-23	1.50E-21
melanosome	26	9.10E-20	6.00E-18
pigment granule	26	9.10E-20	6.00E-18
ribosomal subunit	28	9.40E-18	5.20E-16
ribosome	33	3.70E-16	1.60E-14
cytosolic small ribosomal subunit	17	7.00E-16	2.80E-14
lysosome	30	9.00E-14	3.30E-12
lytic vacuole	30	9.00E-14	3.30E-12
small ribosomal subunit	18	1.70E-13	5.70E-12
vacuole	31	1.50E-12	4.60E-11
membrane-bounded vesicle	43	3.70E-10	1.00E-08
cytoplasmic membrane-bounded vesicle	42	4.90E-10	1.20E-08
chaperonin-containing T-complex	7	1.70E-09	4.10E-08
vesicle	45	5.60E-09	1.20E-07
cytoplasmic vesicle	43	1.40E-08	3.00E-07
proteasome complex	13	3.30E-08	6.40E-07
heterogeneous nuclear ribonucleoprotein complex	8	9.90E-08	1.80E-06
intracellular non-membrane-bounded organelle	105	2.90E-07	5.10E-06
non-membrane-bounded organelle	105	2.90E-07	5.10E-06
cytosolic large ribosomal subunit	10	3.30E-07	5.50E-06
proteasome core complex	8	3.70E-07	5.80E-06
membrane-enclosed lumen	81	6.90E-07	1.00E-05
organelle lumen	79	1.30E-06	1.80E-05
endoplasmic reticulum lumen	12	5.20E-06	7.10E-05
large ribosomal subunit	11	6.60E-06	8.70E-05
platelet alpha granule lumen	9	7.20E-06	9.20E-05
cytoplasmic membrane-bounded vesicle lumen	9	1.30E-05	1.50E-04
soluble fraction	23	1.60E-05	1.90E-04
vesicle lumen	9	1.80E-05	1.90E-04
actin cytoskeleton	21	1.70E-05	2.00E-04
intracellular organelle lumen	73	2.70E-05	2.90E-04
spliceosome	14	3.00E-05	3.10E-04
ER-Golgi intermediate compartment	8	6.80E-05	6.80E-04
platelet alpha granule	9	7.70E-05	7.50E-04
nucleolus	36	8.70E-05	8.20E-04
extracellular region part	44	1.80E-04	1.60E-03
extracellular matrix	20	1.30E-03	1.20E-02
cell surface	20	1.40E-03	1.20E-02
cortical cytoskeleton	7	1.40E-03	1.20E-02
perinuclear region of cytoplasm	17	2.70E-03	2.30E-02
basement membrane	8	3.60E-03	2.90E-02
nuclear lumen	54	3.80E-03	3.00E-02
extracellular space	30	4.70E-03	3.60E-02
cell cortex part	8	5.00E-03	3.70E-02
eukaryotic translation elongation factor 1 complex	3	6.10E-03	4.40E-02

Table 3.3.31: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which increased at 144hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of conditioned media from a DP12 CHO cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
HSPG2	Basement membrane-specific heparan sulfate proteoglycan	7	7	393	0.0114	1.9	Miscellaneous
SBSN	Suprabasin	6	6	466	0.0022	2.5	Miscellaneous
PXDN	Peroxidasin homolog	6	5	383	0.0007	3.8	Oxidoreductase
NCAM1	Neural cell adhesion molecule 1	3	3	199	0.0006	12.8	Axon guidance
CCDC8	Coiled-coil domain-containing protein 80-like	3	3	152	0.0424	2.0	Cell adhesion
BMP1	Bone morphogenetic protein 1	3	3	151	0.0278	2.7	Protease
PLTP	Phospholipid transfer protein	3	3	150	0.0026	2.5	Lipid transport
CALU	Calumenin	3	3	138	1.03E-05	9.5	Calcium ion binding
FN1	Fibronectin	3	3	130	0.0128	5.0	Cell adhesion
CTSB	Cathepsin B	3	2	214	0.0180	1.6	Protease
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	2	2	128	0.0130	2.6	Extracellular matrix organization
MIF	Macrophage migration inhibitory factor	2	2	127	0.0157	124.0	Cell proliferation
SERPINF1	Pigment epithelium-derived factor	2	2	110	0.0021	3.9	Cell proliferation
LGALS3	Galectin-3	2	2	104	8.04E-06	23.1	Stress
LPL	Lipoprotein lipase	2	2	102	0.0089	12.3	Lipid metabolism
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	2	2	94	0.0089	22.5	Miscellaneous
Psap	Sulfated glycoprotein 1	2	2	91	0.0094	27.1	Miscellaneous
CLU	Clusterin	2	2	89	0.0070	4.0	Apoptosis
IL1R1	Interleukin-1 receptor-like 1	2	2	87	0.0335	3.6	Signal transduction

NUCB2	Nucleobindin-2	2	1	102	0.0064	4.1	Calcium-binding protein
MANF	Mesencephalic astrocyte-derived neurotrophic factor	1	1	94	0.0143	33.7	Growth factor
CRELD2	cysteine-rich with EGF-like domain protein 2 precursor	1	1	80	0.0023	57.9	Calcium ion binding
DCN	Decorin	1	1	57	0.0001	259.8	Extracellular matrix organization
TXN	Thioredoxin	1	1	57	0.0034	5.6	Transcription
TINAG	Tubulointerstitial nephritis antigen-like	1	1	57	0.0020	7.4	Endosomal transport
ANXA2	Annexin A2	1	1	54	0.0002	8.0	Membrane binding protein
GPI	Glucose-6-phosphate isomerase	1	1	48	0.0132	11.7	Growth factor
S100A13	Protein S100-A13	1	1	44	0.0002	13.0	Cell proliferation
VEGFA	Vascular endothelial growth factor A	1	1	43	0.0096	3.7	Growth factor
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	1	1	43	0.0495	26.5	Protein folding
PPIA	Peptidyl-prolyl cis-trans isomerase A	1	1	41	0.0007	9.0	Protein folding
CALR	Calreticulin	1	1	40	0.0008	8.1	Cell proliferation

Table 3.3.32: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which decreased at 144hrs when compared to 24hrs at 37˚C, identified during quantitative label free LC/MS analysis of conditioned media from a DP12 CHO cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
C3	Complement C3	11	11	557	0.0001	12.7	Glucose transport
LAMA5	Laminin subunit alpha-5 isoform 1	9	9	536	0.0006	2.8	Cell proliferation
PAM	Peptidyl-glycine alpha-amidating monooxygenase	4	4	277	0.0002	3.9	Oxidoreductase
MMP9	matrix metalloproteinase-9	4	4	269	0.0002	7.6	Protease
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	3	3	197	0.0255	1.9	Serine-type endopeptidase inhibitor activity
PLA2G7	Platelet-activating factor acetylhydrolase	3	3	194	0.0095	3.5	Lipid metabolism
OLFML1	Olfactomedin-like protein 3	3	3	188	0.0011	4.1	Miscellaneous
GPC1	Glypican-1	3	3	159	0.0190	2.0	Axon guidance
SEMA3C	Semaphorin-3C	3	3	151	0.0024	2.6	Miscellaneous
HTRA1	Serine protease HTRA1	3	3	149	0.0135	12.1	Protease
AGRNL	Agrin-like isoform 1	2	2	128	0.0169	7.8	Glycosaminoglycan binding
EPDR1	Mammalian ependymin-related protein 1	2	2	118	0.0004	3.4	Cell-cell adhesion
LAMC1	Laminin subunit gamma-1	2	2	110	0.0087	4.6	Cell proliferation
IGHG1	Ig gamma-1 chain C region	2	2	106	0.0013	6.6	IgG
ABP1	Amiloride-sensitive amine oxidase	2	2	83	0.0193	5.0	Miscellaneous
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	1	1	65	0.0007	4.3	Protease
COL6A1	Collagen alpha-1(VI) chain	1	1	65	0.0197	2.6	Miscellaneous
COL5A2	Collagen alpha-2(V) chain	1	1	60	0.0354	1.9	Miscellaneous
PROS1	Vitamin K-dependent protein S	1	1	58	0.0393	3.1	Endopeptidase inhibitor activity
MAMDC2	MAM domain-containing protein 2	1	1	57	0.0090	2.7	Glycosaminoglycan binding
VEGFC	Vascular endothelial growth factor C	1	1	54	0.0097	3.1	Growth factor
MFGE8	Lactadherin	1	1	53	0.0004	1.9	Cell adhesion
PLAT	Tissue-type plasminogen activator	1	1	51	0.0005	2.5	Protease

IFNAR2	Interferon-alpha/beta receptor beta chain	1	1	45	0.0076	2.0	Cell proliferation
CYR61	Protein CYR61	1	1	44	0.0144	5.9	Cell proliferation
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	43	0.0121	4.6	Proteolysis
IGFBP4	Insulin-like growth factor-binding protein 4	1	1	43	0.0452	21.1	Cell proliferation
NBL1	Neuroblastoma suppressor of tumorigenicity 1-like	1	1	42	0.0205	1.8	Miscellaneous
P15156	Calcium-dependent serine proteinase	1	1	41	2.01E-05	5.6	Protease

Table 3.3.33: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which increased at 144hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of conditioned media from a DP12 CHO cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
FN1	Fibronectin	8	8	456	0.0073	2.6	Cell adhesion
NUCB2	Nucleobindin-2	7	6	416	0.0008	3.7	Calcium-binding protein
CCDC8	coiled-coil domain-containing protein 80-like	6	6	420	0.0096	2.9	Cell adhesion
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	5	5	254	0.0022	1.6	Miscellaneous
SBSN	Suprabasin	4	4	242	0.0443	1.8	Miscellaneous
DCN	Decorin	4	4	220	0.0073	1.9	Extracellular matrix organization
LAMC1	Laminin subunit gamma-1	3	3	175	0.0203	2.6	Cell proliferation
CALR	Calreticulin	3	3	160	0.0001	6.3	Cell cycle
Psap	Sulfated glycoprotein 1	3	3	147	0.0090	38.0	Oxidoreductase
QSOX1	Sulfhydryl oxidase 1	3	3	145	0.0060	8.2	Oxidoreductase
FAM3C	Protein FAM3C	2	2	146	0.0029	3.5	Miscellaneous
DPP7	Dipeptidyl peptidase 2	2	2	121	0.0001	3.3	Protease
SERPINF1	Pigment epithelium-derived factor	2	2	118	0.0055	1.7	Cell proliferation
CTSB	Cathepsin B	2	2	117	3.59E-05	4.3	Protease
CALU	Calumenin	2	2	111	0.0151	17.8	Cell proliferation
LPL	Lipoprotein lipase	2	2	109	0.0013	4.9	Lipid metabolism
GPI	Glucose-6-phosphate isomerase	2	2	106	0.0001	5.2	Growth factor
NPPA	Atrial natriuretic factor	2	2	105	4.59E-05	3.3	Miscellaneous
SCPEP1	Retinoid-inducible serine carboxypeptidase	2	2	96	0.0051	3.0	Protease
P15156	Calcium-dependent serine proteinase	2	2	84	0.0001	2.6	Protease
PLA2G7	platelet-activating factor acetylhydrolase-like	2	1	122	0.0019	4.6	Lipid metabolism
NRP1	Neuropilin-1	1	1	99	0.0027	1.7	Cell cell signalling
YBX1	Nuclease-sensitive element-binding protein 1	1	1	72	0.0025	7.9	Transcription
SIAE	sialate O-acetylesterase-like	1	1	71	0.0245	2.7	Hydrolase
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	1	1	69	0.0034	1.9	Extracellular matrix organization

LGALS3BP	Galectin-3-binding protein	1	1	61	0.0023	3.2	Cell adhesion
TXN	Thioredoxin	1	1	55	0.0062	2.9	Transcription
S100A13	Protein S100-A13	1	1	53	0.0010	19.4	Cell proliferation
ANXA2	Annexin A2	1	1	53	0.0056	12.5	Membrane binding protein
GRN	granulins isoform 1	1	1	48	0.0067	11.6	Apoptosis
SPARC	SPARC	1	1	46	0.0054	34.8	Cell proliferation
CTSD	Cathepsin D	1	1	43	0.0006	35.3	Protease
LGALS3	Galectin-3	1	1	42	0.0015	3.5	Stress
TIMP2	Metalloproteinase inhibitor 2	1	1	41	0.0258	3.7	MMP inhibitor
MIF	Macrophage migration inhibitory factor	1	1	41	4.93E-05	102.8	Cell proliferation

Table 3.3.34: List of host cell proteins, classified as secreted by uniprot protein database, the expression of which decreased at 144hrs when compared to 24hrs at 31˚C, identified during quantitative label free LC/MS analysis of conditioned media from a DP12 CHO cell line.

Gene Symbol	Description	Total Peptide	Quantitative Peptides	Score	Anova (p)	Fold	Function
C3	Complement C3	7	7	437	0.0017	4.4	Glucose transport
AGRNL	Agrin-like isoform 1	3	3	159	0.0035	9.3	Glycosaminoglycan binding
NPC2	Epididymal secretory protein E1	2	2	125	0.0427	29.8	Lipid metabolism
TIMP1	Metalloproteinase inhibitor 1	2	2	103	0.0001	2.9	MMP inhibitor
MFGE8	Lactadherin	2	2	94	0.0006	1.6	Cell adhesion
OLFML1	Olfactomedin-like protein 3	2	2	91	2.44E-05	4.3	Miscellaneous
MMP9	Matrix metalloproteinase-9	2	2	89	0.0015	4.1	Protease
LIFR	Leukemia inhibitory factor	1	1	81	0.0077	5.2	Cell proliferation
TGFB1	Transforming growth factor beta-1	1	1	71	0.0025	1.6	Growth factor
GPC1	Glypican-1	1	1	65	0.0015	3.7	Axon guidance
BTD	Biotinidase	1	1	64	0.0288	97.3	Biotin metabolic process
ABP1	Amiloride-sensitive amine oxidase	1	1	60	0.0014	8.2	Miscellaneous
EPDR1	Mammalian ependymin-related protein 1	1	1	47	0.0009	7.9	Cell-cell adhesion

MMP19	Matrix metalloproteinase-19	1	1	46	0.0123	3.3	Protease
PCOLCE	Procollagen C-endopeptidase enhancer 1	1	1	43	0.0086	2.7	Proteolysis
PTHLH	Parathyroid hormone-related protein	1	1	42	0.0002	12.2	Cell-cell signalling

Table 3.3.35: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being common to 37˚C and 31˚C cultures. Proteins identified with two or more peptides as being common to 37˚C and 31˚C cultures are also indicated.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	4.8	78	11.0	9.5	
YWHAB	14-3-3 protein beta/alpha isoform 2	22.54	3	21.7	241	27.8	4.8	x
YWHAE	14-3-3 protein epsilon, partial	33.33	4	16.5	80	11.9	5.8	x
YWHAH	14-3-3 protein eta	17.89	2	17.9	86	28.2	4.9	x
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0	x
YWHAQ	14-3-3 protein theta	21.63	2	19.3	123	27.7	4.8	x
YWHAZ	14-3-3 protein zeta/delta	17.55	2	11.8	122	27.7	4.8	x
PSMD4	26S proteasome non-ATPase regulatory subunit 4	2.65	1	3.6	63	40.7	4.8	
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7	
RPS10	40S ribosomal protein S10	4.97	1	2.8	59	20.4	10.1	
RPS11	40S ribosomal protein S11	12.03	2	6.0	40	18.3	10.0	
RPS12	40S ribosomal protein S12	21.97	2	12.1		14.5	6.7	
RPS15A	40S ribosomal protein S15a	17.69	2	8.3	66	14.8	10.1	x
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2	
RPS18	40S ribosomal protein S18	28.68	4	12.6	67	15.7	10.4	x
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2	
RPS19	40S ribosomal protein S19, partial	7.35	1	2.3	45	15.1	10.5	
RPS2	40S ribosomal protein S2	12.90	2	5.5	40	20.4	9.5	x
RPS20	40S ribosomal protein S20	15.00	2	5.6	48	13.4	9.9	
RPS21	40S ribosomal protein S21	22.89	2	6.7	51	9.1	8.3	
RPS24	40S ribosomal protein S24	17.24	1	4.2	63	10.0	10.6	
RPS25	40S ribosomal protein S25	15.13	2	6.2	56	13.5	10.9	x
RPS27	40S ribosomal protein S27	22.41	1	3.7	69	6.8	8.0	
RPS3	40S ribosomal protein S3	11.93	2	7.3	66	26.7	9.7	x
RPS3A	40S ribosomal protein S3a	7.58	2	8.8	58	29.9	9.7	
RPS6	40S ribosomal protein S6	31.34	2	6.2		7.6	5.0	x
RPS8	40S ribosomal protein S8	13.46	2	7.3	47	24.2	10.3	x

RPS9	40S ribosomal protein S9	14.62	2	4.8	56	14.8	10.8	
RPSA	40S ribosomal protein SA	13.41	2	7.2	61	19.7	9.3	x
SDF4	45 kDa calcium-binding protein	22.82	6	27.6	225	41.2	4.9	x
RPLP0	60S acidic ribosomal protein P0	7.72	2	6.1	43	29.9	8.5	x
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4	
RPLP2	60S acidic ribosomal protein P2	25.22	2	8.9	120	11.7	4.5	x
RPL11	60S ribosomal protein L11	13.17	2	6.2	66	19.0	9.8	x
RPL12	60S ribosomal protein L12	49.25	3	16.9	121	14.7	9.6	x
RPL15	60S ribosomal protein L15, partial	10.61	2	7.2	75	23.5	11.6	
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8	x
RPL23	60S ribosomal protein L23	25.00	2	9.9	89	14.9	10.5	
RPL23A	60S ribosomal protein L23a	32.84	2	3.3	72	7.6	8.4	x
RPL29	60S ribosomal protein L29	9.65	1	6.0	56	12.4	11.5	
RPL3	60S ribosomal protein L3	7.44	2	7.5	71	46.1	10.2	x
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3	
RPL5	60S ribosomal protein L5	9.46	2	6.9		34.2	9.8	x
Rpl6	60S ribosomal protein L6	14.53	2	4.9	41	13.6	9.9	x
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9	x
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4.55	2	5.6	45	53.3	6.6	x
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8	x
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7	0.68	1	3.5	56	177.6	5.8	
ACAT2	acetyl-CoA acetyltransferase, cytosolic	10.08	2	6.9	100	41.0	7.3	x
ASAH1	Acid ceramidase	11.14	3	11.8	71	44.6	7.9	x
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0	x
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9	x
ACTA1	actin, alpha skeletal muscle	24.93	1	34.3	212	42.0	5.4	
ACTB	actin, cytoplasmic 1	45.33	5	60.7	531	41.7	5.4	x
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	8.0	91	14.4	9.6	x
DBI	acyl-CoA-binding protein	32.18	2	5.7	42	10.0	8.8	x
CRKL	adapter molecule crk	8.56	2	11.9	130	36.1	5.7	
APRT	adenine phosphoribosyltransferase	16.67	2	9.2		19.4	6.0	x
AHCY	adenosylhomocysteinase	4.40	2	5.9	59	47.6	6.5	x

AK2	Adenylate kinase 2, mitochondrial	21.13	2	12.7	49	15.4	7.9	x
ADSL	Adenylosuccinate lyase	4.55	2	4.5		54.9	6.9	x
CAP1	adenylyl cyclase-associated protein 1 isoform 1	6.33	2	7.6	64	51.5	7.3	x
ADM	ADM	22.28	2	9.8	82	20.6	10.2	x
ARF1	ADP-ribosylation factor 1	18.23	2	8.6	104	20.7	6.3	
ARF1	ADP-ribosylation factor 1, partial	23.08	1	4.1	89	7.3	5.3	
AGRN	agrin isoform 1	1.33	2	8.3	97	217.0	5.8	x
AARS	Alanyl-tRNA synthetase, cytoplasmic	2.73	2	7.3		104.8	5.6	x
AKR1A1	alcohol dehydrogenase	13.27	3	12.6	89	36.5	7.1	x
ADH5	alcohol dehydrogenase class-3	6.68	2	6.5		39.6	7.7	x
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1	x
AKR1B1	aldose reductase	8.54	2	8.0	43	35.8	7.4	x
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1	
ACTN1	Alpha-actinin-1	7.31	2	17.7	239	102.7	5.5	x
ACTN4	Alpha-actinin-4	13.56	2	12.4	154	33.7	4.9	x
ENO1	alpha-enolase	21.21	7	32.4	246	46.7	6.2	x
GLA	Alpha-galactosidase A	13.49	3	11.6	86	38.5	5.0	x
IDUA	alpha-L-iduronidase	4.06	2	2.7	44	72.1	6.8	x
MAN2A1	Alpha-mannosidase 2	4.13	2	8.3	92	78.3	8.0	
NAGA	alpha-N-acetylgalactosaminidase	22.89	5	29.0	261	47.2	7.8	x
NAGLU	alpha-N-acetylglucosaminidase	1.76	1	2.7	42	83.4	6.7	
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6	x
APP	Amyloid beta A4 protein	24.10	14	75.5	620	84.7	4.8	x
APLP2	Amyloid protein 2	13.48	7	22.5	57	84.8	4.8	x
ANXA1	Annexin A1	13.29	3	13.3	79	38.8	7.0	x
ANXA2	annexin A2, partial	11.89	2	8.4	84	25.4	6.0	x
ANXA5	annexin A5	7.79	2	7.2	69	36.0	5.0	x
ARSA	arylsulfatase A	8.88	2	8.1	94	55.0	5.1	x
GOT1	aspartate aminotransferase, cytoplasmic	6.05	2	7.2	68	46.2	7.2	x
DHX9	ATP-dependent RNA helicase A	1.34	1	2.9		133.1	6.6	
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5	x
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	23.66	24	450.9	3732	471.6	6.5	x

B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8	
B2M	beta-2-microglobulin precursor	27.73	3	53.8	328	13.8	7.4	x
GLB1	Beta-galactosidase	3.38	2	6.0	46	73.6	6.9	x
GUSB	Beta-glucuronidase	8.64	2	8.2		27.9	7.9	x
HEXA	beta-hexosaminidase subunit alpha	5.87	2	7.9	73	60.6	6.5	x
HEXB	Beta-hexosaminidase subunit beta	4.22	2	5.2	44	49.0	6.6	x
ATIC	bifunctional purine biosynthesis protein PURH	3.38	2	5.7		64.6	7.0	x
BTD	biotinidase	5.03	2	7.0	81	60.1	6.1	x
BMP1	bone morphogenetic protein 1	11.78	9	36.1	328	106.1	7.2	x
PRSS22	brain-specific serine protease 4	11.35	3	14.4	103	41.2	7.3	x
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic	2.35	2	7.2	87	101.2	7.8	x
P15156	calcium-dependent serine proteinase	21.29	10	51.6	417	77.4	4.8	x
CALM1	Calmodulin	15.33	2	7.0	87	16.9	4.2	x
CALR	Calreticulin	9.11	3	10.7	80	48.2	4.5	x
CLSTN1	Calsyntenin-1	9.50	6	32.6	258	92.2	4.8	x
CALU	calumenin	6.03	2	7.4	70	37.0	4.7	x
CHST14	carbohydrate sulfotransferase 14	5.59	1	4.1	45	43.0	9.2	
CBR1	Carbonyl reductase	23.24	2	16.9	117	26.7	7.8	x
CAT	catalase	4.74	2	6.7	58	60.0	7.7	x
CTSB	cathepsin B	25.96	7	63.2	564	37.5	6.1	x
CTSD	cathepsin D	14.95	6	22.4	224	44.1	7.0	x
CTSL1	cathepsin L1	30.93	8	47.1	408	37.2	7.2	x
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5	x
CCL2	c-C motif chemokine 2	11.89	2	13.0	95	15.8	9.2	x
ALCAM	CD166 antigen	4.29	2	6.0	75	65.0	6.3	x
CD44	CD44 antigen isoform 5	5.85	2	6.1	65	39.4	5.9	x
CD63	CD63 antigen	4.31	1	3.0	43	25.5	7.6	
CLN5	Ceroid-lipofuscinosis neuronal protein 5	8.28	2	7.3	56	35.4	7.1	
CLIC1	chloride intracellular channel protein 1	11.20	2	5.8		26.9	5.2	x
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4	x
CSPG4	chondroitin sulfate proteoglycan 4	9.21	15	54.0	446	251.9	5.7	x
CBX3	Chromobox protein homolog 3	7.82	1	5.4	70	20.4	5.3	
CLTC	clathrin heavy chain 1	1.37	2	7.2	73	191.6	5.8	

CLU	clusterin	37.98	15	155.9	1224	51.5	5.8	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	9.13	2	5.3	44	23.9	9.6	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	11.18	3	12.5	118	38.9	9.4	x
ARCN1	coatomer subunit delta	2.15	1	2.9	57	57.2	6.2	
CFL1	cofilin-1	31.93	3	11.6	60	18.5	8.1	x
CCDC80	coiled-coil domain-containing protein 80	16.14	9	39.6	312	107.4	9.7	x
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4	
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9	x
COL6A1	Collagen alpha-1(VI) chain	10.34	7	21.6	179	88.9	6.6	x
COL5A2	Collagen alpha-2(V) chain	5.22	2	6.5	58	40.6	5.9	x
C1ra	Complement C1r-A subcomponent	7.81	4	17.1	208	79.9	6.1	x
C3	Complement C3	4.17	2	5.7	48	59.2	6.6	x
CORO1B	coronin-1B	4.55	2	6.2	53	53.8	5.8	x
CORO1C	coronin-1C	1.69	1	2.2		53.1	7.1	
CAND1	cullin-associated NEDD8-dissociated protein 1	1.91	2	7.6	121	133.5	5.7	x
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8	x
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	2.89	1	3.1	54	43.1	10.4	
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4	x
CSRP1	cysteine and glycine-rich protein 1	12.95	2	6.1	45	20.5	8.6	x
CRIP2	cysteine-rich protein 2	10.10	2	6.5	56	22.7	8.6	x
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1	
Cycs	cytochrome c, somatic	25.71	2	33.0	199	11.5	9.8	x
CNDP2	cytosolic non-specific dipeptidase	7.58	3	10.3	78	52.8	5.9	x
PHGDH	d-3-phosphoglycerate dehydrogenase	2.06	1	3.7	63	56.5	6.9	
DDT	D-dopachrome decarboxylase	24.58	2	5.3	91	13.1	7.1	x
DCN	decorin	33.15	10	111.7	720	40.1	8.4	x
DNASE2	Deoxyribonuclease-2-alpha	11.93	3	14.0	97	38.4	7.3	x
DPT	dermatopontin	9.45	2	5.8	48	24.0	4.9	x
DSTN	destrin	12.12	2	5.6	64	18.6	7.7	x
DKK3	dickkopf-related protein 3	18.39	4	29.6	392	38.3	4.5	x
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0	x

DPP7	Dipeptidyl peptidase 2	9.92	4	12.1	72	53.1	6.6	x
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	3.49	2	8.3	45	83.8	7.8	x
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1	
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	3.13	2	7.4		106.2	7.5	x
ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	3.72	2	6.6	64	91.8	7.7	
DLG5	disks large homolog 5	2.56	1	2.3		27.8	6.9	
DAG1	Dystroglycan	8.73	5	24.4	203	96.8	8.5	x
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1	x
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	9.60	2	6.9	42	42.0	5.4	
EEF1A1	elongation factor 1-alpha 1	20.13	6	33.1	174	50.1	9.0	x
EEF1B2	elongation factor 1-beta	12.44	2	9.7	142	24.7	4.7	x
EEF1D	elongation factor 1-delta isoform 1	12.81	2	3.7	58	31.3	5.1	x
EEF1G	Elongation factor 1-gamma	5.72	2	8.1	94	50.0	6.6	x
EEF2	Elongation factor 2	3.61	3	6.5	84	95.2	6.6	x
HSP90B1	Endoplasmin	10.21	5	17.1	109	92.6	4.8	x
NPC2	epididymal secretory protein E1	14.09	2	8.7		16.5	8.0	x
EIF4A1	Eukaryotic initiation factor 4A-I	7.52	2	12.5	139	40.8	5.5	x
EIF1B	Eukaryotic translation initiation factor 1b	12.39	1	3.9	81	12.8	7.4	
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	8.89	2	6.1		36.1	5.2	x
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.4	x
EIF3G	eukaryotic translation initiation factor 3 subunit G	4.06	1	3.0		35.7	5.9	
EIF3I	eukaryotic translation initiation factor 3 subunit I	3.69	1	6.4		36.3	5.6	
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7	x
EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0	
EIF5A	Eukaryotic translation initiation factor 5A-1	45.45	2	14.1	64	7.2	6.5	x
EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7	
EXT2	Exostosin 2	9.49	2	7.9	94	35.7	8.6	x
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6	x
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8	x
ECM1	extracellular matrix protein 1	1.60	1	2.7		63.2	6.8	
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1	x
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8	x

CAPZB	F-actin-capping protein subunit beta	8.91	2	6.2	78	29.0	7.7	x
FDPS	Farnesyl pyrophosphate synthetase	6.13	2	6.8	62	43.2	7.8	x
FASN	Fatty acid synthase	2.02	2	7.8		206.1	6.7	x
FABP4	fatty acid-binding protein, adipocyte	19.70	2	7.2	46	14.7	7.9	x
FTH1	Ferritin heavy chain	14.05	2	11.9	151	21.4	6.2	x
FN1	fibronectin isoform 2	15.03	24	96.6	672	262.9	5.9	x
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8	
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3	x
FSTL1	follistatin-related protein 1	13.40	3	19.0	186	34.6	5.7	x
ALDOA	fructose-bisphosphate aldolase A isoform 1	7.97	2	8.9	127	39.4	8.1	x
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7	x
LGALS3	galectin-3	8.05	2	6.1	42	27.2	8.9	x
LGALS3BP	galectin-3-binding protein	12.89	5	15.2	191	63.8	5.2	x
IFI30	gamma-interferon-inducible lysosomal thiol reductase	16.67	2	10.4		27.4	5.2	
GM2A	ganglioside GM2 activator	16.75	2	7.5	95	20.8	6.7	x
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4	x
GPI	glucose-6-phosphate isomerase	4.66	2	7.1	88	63.0	7.6	x
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5	
GBA	glucosylceramidase	24.66	8	40.0	365	57.4	8.1	x
GSR	Glutathione reductase, mitochondrial	5.24	2	6.8		45.9	7.0	x
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8	x
Gsta3	glutathione S-transferase alpha-3	17.65	2	8.8	124	25.4	8.0	x
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4	x
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0	x
GSTO1	glutathione S-transferase omega-1 isoform 3	11.06	2	5.0	71	23.5	7.7	x
GSTP1	glutathione S-transferase P 1	48.57	8	31.3	253	23.6	7.8	x
Q00285	glutathione S-transferase Y1	29.36	4	22.0	267	26.0	8.4	x
GSS	glutathione synthetase	11.60	4	14.4	92	52.2	5.6	x
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	37.76	7	38.3	449	36.3	8.5	x
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4	x
GARS	Glycyl-tRNA synthetase	1.67	1	3.3	54	74.4	6.4	
GPC1	glypican-1	6.27	3	11.8	169	78.5	7.3	x
GLG1	Golgi apparatus protein 1 precursor	1.72	2	6.1	108	132.2	6.8	x

GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2	x
GRN	granulins isoform 2	4.90	2	9.3	51	63.9	6.4	x
GRN	granulins isoform 3	4.55	2	6.0	54	57.0	6.5	x
RAN	GTP-binding nuclear protein Ran	9.72	2	5.5	58	24.5	7.0	x
GNB2L1	Guanine nucleotide-binding protein subunit beta-2 1	13.77	2	7.8	54	30.4	7.4	x
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0	x
Cd74	H-2 class II histocompatibility antigen gamma chain	6.38	2	5.3	47	36.3	8.7	x
HSPA13	Heat shock 70 kDa protein 13	11.89	5	21.9	173	51.9	6.7	x
HSPA4	Heat shock 70 kDa protein 4	9.70	6	22.7	148	93.4	5.2	x
HSPA8	heat shock cognate 71 kDa protein	23.37	11	53.3	532	70.8	5.4	x
HSP90AB1	heat shock protein HSP 90-beta	16.71	10	37.5	235	83.1	5.0	x
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6	x
HPSE	Heparanase	2.59	1	2.3		43.5	9.4	
HDGF	Hepatoma-derived growth factor	10.05	1	5.3		20.9	4.5	
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	8.53	2	5.1		23.7	9.6	x
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	17.19	4	19.8	115	34.2	9.2	x
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	24.76	2	11.5	97	12.0	6.1	x
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C 1 isoform 2	11.22	3	6.1	130	32.4	5.1	x
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	14.10	2	11.1	96	25.6	8.6	x
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	8.17	2	6.0		45.8	5.6	
RBMX	heterogeneous nuclear ribonucleoprotein G	9.00	2	7.8	84	31.5	9.8	x
HNRNPK	heterogeneous nuclear ribonucleoprotein K isoform 4	5.69	2	7.0	50	48.5	5.9	x
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4	x
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	3.74	2	6.2	89	62.6	7.6	x
HNRNPU	heterogeneous nuclear ribonucleoprotein U	1.62	1	3.2		69.8	8.9	
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	8.67	2	5.6	44	32.3	9.1	x
HMGB1	High mobility group protein B1	17.50	3	15.7	140	27.8	6.3	x
HMGB2	High mobility group protein B2	5.03	1	2.6		18.2	5.4	
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1	4.2	68	8.0	6.8	
H1F0	Histone H1.0	11.34	2	9.2	108	20.9	10.9	x
HIST1H2AG	Histone H2A type 1	20.24	3	29.4	114	34.2	11.1	x
H2AFX	Histone H2A.x	27.27	2	25.0	120	15.1	10.9	
HIST1H2AG	Histone H2B type 1	26.98	2	10.8	169	13.9	10.3	x

HIST1H3A	Histone H3	19.10	2	28.4	104	29.6	11.1	x
HIST3H3	Histone H3.1t	9.69	1	6.4	167	35.8	10.7	
HIST1H4A	Histone H4	21.36	2	6.5	61	11.4	11.4	x
RBBP7	histone-binding protein RBBP7	4.35	2	4.7	44	43.6	5.1	x
ST13	Hsc70-interacting protein	18.55	2	5.2	48	13.9	6.8	x
CDC37	hsp90 co-chaperone Cdc37	6.86	2	6.9	42	44.4	5.3	
HAPLN4	hyaluronan and proteoglycan link protein 4	9.59	3	7.2	120	46.2	8.0	x
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic	4.62	2	5.4		57.3	5.7	x
N/A	hypothetical protein LOC100766349	10.13	2	6.4	80	25.5	9.9	x
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.2	97	19.7	8.7	x
HPRT1	hypoxanthine-guanine phosphoribosyltransferase	12.15	2	7.8	52	24.2	7.0	x
HYOU1	Hypoxia up-regulated protein 1	2.50	2	5.7	72	111.4	5.2	x
KPNB1	Importin subunit beta-1	4.34	3	9.5	49	97.1	4.8	x
IPO5	importin-5	2.15	2	7.9	134	120.3	4.9	x
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7	
PPA1	Inorganic pyrophosphatase	11.00	2	10.3		34.9	5.6	x
ISYNA1	Inositol-3-phosphate synthase 1	3.46	1	2.3		50.3	5.6	
IGFBP4	insulin growth factor-binding protein 4	15.35	3	12.2	40	27.7	7.1	x
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	26.89	20	94.0	618	106.5	8.3	x
IFNAR2	Interferon-alpha/beta receptor beta chain	8.30	2	7.4	87	28.7	5.6	x
ILF2	interleukin enhancer-binding factor 2	6.15	2	7.6	105	43.0	5.3	x
ILF3	interleukin enhancer-binding factor 3	3.23	3	8.4	63	95.8	8.7	x
IL1R1	Interleukin-1 receptor 1	11.18	5	43.3	227	37.6	9.0	x
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5	x
IDH1	isocitrate dehydrogenase	5.56	2	7.4	119	46.7	7.0	x
KRT10	Keratin, type I cytoskeletal 10	12.35	3	7.1	120	27.8	4.5	x
KRT77	Keratin, type II cytoskeletal 1b	5.39	2	10.8	113	93.4	5.5	x
KRT5	keratin, type II cytoskeletal 5	1.80	1	2.4		54.4	5.4	
KRT71	Keratin, type II cytoskeletal 71	4.41	2	26.1	157	133.3	6.6	x
KRT8	keratin, type II cytoskeletal 8	4.10	1	6.2	72	54.3	5.8	
MFGE8	Lactadherin	27.63	9	44.2	467	47.1	7.9	x
MFGE8	lactadherin, partial	11.37	3	10.2	172	32.3	5.7	x
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1	x

LMNA	Lamin-A/C	6.04	3	10.0	101	64.0	8.0	x
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9	x
LAMA5	laminin subunit alpha-5 isoform 1	15.98	44	183.9	1491	405.6	6.9	x
LAMB1	Laminin subunit beta-1	18.21	32	120.1	838	202.0	4.9	x
LAMC1	Laminin subunit gamma-1	17.82	19	78.5	695	170.3	5.1	x
N/A	Lamin-L(I)	2.28	1	3.1	53	54.9	4.9	
LGMN	legumain	33.33	9	76.3	618	49.6	6.6	x
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9	x
SERPINB1	Leukocyte elastase inhibitor A	6.33	2	7.3		42.9	6.2	x
LASP1	LIM and SH3 domain protein 1	19.38	4	13.8	86	25.8	5.9	x
LPL	Lipoprotein lipase	46.67	16	171.0	1083	50.5	7.9	x
LDHA	L-lactate dehydrogenase A chain	8.13	2	10.6	148	36.5	7.4	x
ACP1	low molecular weight phosphotyrosine protein phosphatase	7.69	1	4.0	63	18.0	7.7	
LDLR	low-density lipoprotein receptor precursor	4.57	3	11.5	143	94.5	4.9	x
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7	x
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase	7.05	2	8.4	96	45.6	7.7	x
GAA	lysosomal alpha-glucosidase	13.91	9	29.1	241	105.8	6.0	x
MAN2B1	Lysosomal alpha-mannosidase	3.07	2	3.8	82	88.8	7.7	x
CTSA	Lysosomal protective protein	11.16	4	22.7	176	54.2	6.1	x
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	8.6	75	55.4	6.7	x
LOXL4	Lysyl oxidase 4	4.49	2	4.8	100	84.7	8.0	
LOXL3	Lysyl oxidase homolog 3	12.81	2	8.7		23.5	6.4	x
KARS	lysyl-tRNA synthetase isoform 1	3.18	2	6.2		67.9	6.2	
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5	x
CSF1	macrophage colony-stimulating factor 1 isoform 2	7.39	2	6.4		29.5	7.4	x
MIF	macrophage migration inhibitory factor	17.39	2	3.0	185	12.4	7.3	x
CAPG	Macrophage-capping protein	7.87	2	6.1	67	33.3	5.8	x
MDH1	malate dehydrogenase, cytoplasmic	14.07	3	11.6	57	36.4	6.6	x
EPDR1	Mammalian ependymin-related protein 1	9.96	2	6.6	82	27.5	6.7	x
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	4.67	2	7.1	119	56.0	6.5	x
MMP19	matrix metalloproteinase-19	31.43	11	53.4	439	58.9	7.9	x
MMP9	matrix metalloproteinase-9	10.00	6	20.0	104	78.8	5.9	x
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8	

MANF	Mesencephalic astrocyte-derived neurotrophic factor	7.82	1	3.9		20.4	8.3	
TIMP1	metalloproteinase inhibitor 1	17.24	3	45.1	427	22.4	8.5	x
TIMP2	Metalloproteinase inhibitor 2	15.59	2	11.4	158	20.9	6.7	x
CLNS1A	methylosome subunit pICln	5.51	1	4.1	80	26.1	4.1	
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0	x
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0	x
MAP6	microtubule-associated protein 6, partial	7.56	1	2.3		50.2	9.2	
eb1	microtubule-associated protein RP/EB family member 1	7.46	1		43	30.0	5.2	
MSN	moesin	3.36	2	5.9	80	66.5	6.3	x
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2	
MYL6	Myosin light polypeptide 6	19.08	2	7.8	62	17.3	4.6	x
MTPN	myotrophin	17.53	1	4.1	57	10.4	6.5	
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 1	21.68	3	16.3	237	37.2	7.5	x
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	14.98	4	15.9	142	34.2	6.9	x
GNS	N-acetylglucosamine-6-sulfatase	6.75	3	8.9		53.7	6.9	x
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.23	2	12.6	175	47.5	7.5	x
Nlrp9a	NACHT, LRR and PYD domains-containing protein 9A	2.29	1	2.7		59.4	6.1	
NACA	nascent polypeptide-associated complex subunit alpha	13.49	2	9.8	143	23.4	4.6	x
NPPB	natriuretic peptides B	31.40	3	27.3	196	13.4	10.1	
NEO1	Neogenin	1.94	2	6.0	57	113.1	7.1	x
NCAM1	Neural cell adhesion molecule 1	9.09	2	6.7	64	30.2	5.2	
NBL1	neuroblastoma suppressor of tumorigenicity 1	3.93	1	2.0		19.1	5.0	
NRP1	neuropilin-1	1.41	1	3.3	56	103.0	5.9	
GANAB	neutral alpha-glucosidase AB isoform 2	3.18	2	7.5		106.9	6.0	x
NHP2L1	NHP2 protein 1	16.44	1	2.9	62	8.0	7.9	
NID1	Nidogen-1	40.32	34	284.9	2709	136.1	5.1	x
Nid1	nidogen-1, partial	61.41	12	170.2	1070	54.6	6.4	x
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9	x
NONO	non-POU domain-containing octamer-binding protein	2.82	1	8.4	48	48.9	8.0	
NSFL1C	NSFL1 cofactor p47 isoform 2	7.57	2	8.3	82	40.7	5.1	x
SGSH	N-sulphoglucosamine sulphohydrolase	6.18	2	7.0	89	56.5	6.5	x
NASP	nuclear autoantigenic sperm protein	1.30	1	2.8		83.4	4.4	
NUDC	Nuclear migration protein nudC	9.22	2	7.2		32.8	6.0	x

YBX1	Nuclease-sensitive element-binding protein 1	16.90	2	9.0	153	32.7	10.1	x
NUCB1	Nucleobindin-1	40.25	10	50.2	427	38.2	5.7	x
NUCB2	nucleobindin-2	31.43	13	58.5	490	50.3	5.1	x
NCL	Nucleolin	5.85	3	7.9	47	52.4	4.5	x
NPM1	Nucleophosmin	8.21	2	6.0	78	31.0	4.7	x
NME1	nucleoside diphosphate kinase A isoform 1	21.05	2	8.2		17.2	6.3	x
NME2	nucleoside diphosphate kinase B	28.29	2	10.9	137	17.3	8.0	x
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7	x
NAP1L4	Nucleosome assembly protein 1 4	11.01	2	11.4	78	39.4	4.7	x
OLA1	Obg ATPase 1	5.17	1	10.4	174	31.9	8.5	
OLFML3	Olfactomedin protein 3	18.47	7	28.9	195	45.9	6.2	x
OAF	Out at first protein homolog	35.92	6	37.8	230	23.8	8.0	x
PPT1	palmitoyl-protein thioesterase 1	7.84	2	2.5	44	34.5	7.9	x
VNN1	Pantetheinase	5.27	2	7.4	131	56.7	5.5	x
PDLIM1	PDZ and LIM domain protein 1	3.65	1	3.2		35.9	7.1	
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	7.29	4	11.0	100	94.7	6.5	x
PPIA	Peptidyl-prolyl cis-trans isomerase	25.61	4	13.0	180	17.9	8.3	x
PPIB	peptidyl-prolyl cis-trans isomerase B	37.04	8	42.7	441	23.6	9.6	x
PPIC	Peptidyl-prolyl cis-trans isomerase C	19.38	2	8.1	95	17.5	6.4	x
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	28.70	2	9.7	88	11.9	8.7	
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3, partial	5.85	1	2.5	43	21.1	9.3	
PXDN	peroxidasin homolog	14.85	17	79.3	766	165.3	7.0	x
PRDX1	Peroxiredoxin-1	47.24	10	59.5	462	22.2	7.7	x
PRDX4	peroxiredoxin-4	8.50	2	13.7	144	38.8	8.4	x
PRDX6	peroxiredoxin-6, partial	12.79	2	6.6	70	24.5	6.8	x
PEBP1	Phosphatidylethanolamine-binding protein 1	16.58	2	4.0	87	20.9	7.1	x
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6	x
PGM1	Phosphoglucomutase-1	2.23	1	3.6	84	58.5	5.6	
PGM2	phosphoglucomutase-2	2.10	1	3.4	80	69.0	6.3	
PGK1	phosphoglycerate kinase 1	5.28	2	5.8	41	44.5	7.9	x
PGAM1	Phosphoglycerate mutase 1	14.61	2	3.4	95	20.2	8.1	x
PLTP	Phospholipid transfer protein	10.89	4		210	50.6	6.0	x
SERPINF1	Pigment epithelium-derived factor	22.73	6	19.0	192	46.4	6.9	x

PIR	pirin	7.59	2	10.6	108	32.1	6.5	x
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2	9.5	69	44.1	10.3	x
PLS3	plastin-3	5.24	3	10.6	129	70.8	5.7	x
PLA2G7	Platelet-activating factor acetylhydrolase	9.62	2	10.0	105	38.2	8.7	x
PAFAH1B2	platelet-activating factor acetylhydrolase IB subunit beta, partial	6.77	1	2.9	63	14.5	6.4	
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8	
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	0.86	1	5.5		129.5	6.3	
PLEC	plectin	0.60	2	6.0		533.6	5.9	
PCBP2	poly(rC)-binding protein 2 isoform 4	9.63	2	8.3	65	33.9	8.2	x
PABPC1	Polyadenylate-binding protein 1	5.84	2	6.3	40	62.7	9.6	x
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9	x
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	3.3	59	23.2	8.8	
N/A	polyubiquitin	32.81	2	4.8		42.9	7.6	x
KCNH4	potassium voltage-gated channel subfamily H member 4	1.51	1	2.6		115.7	8.8	
PFDN2	Prefoldin subunit 2	11.69	1		45	8.4	8.2	
TSR2	Pre-rRNA-processing protein TSR2	13.45	1	4.9	66	13.2	4.4	
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	6.4	63	69.2	8.9	x
CTSH	pro-cathepsin H	7.81	2	6.3	51	37.4	8.5	x
PCOLCE	procollagen C-endopeptidase enhancer 1	24.15	7	43.7	326	50.4	7.9	x
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	7.15	4	15.9	139	83.7	6.6	x
PFN1	Profilin-1	20.00	2	6.9		14.9	8.3	x
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1	
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5	
PA2G4	Proliferation-associated protein 2G4	7.55	2	6.8		41.1	8.0	x
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6	x
PTGR1	prostaglandin reductase 1	10.94	2	7.2	60	35.7	7.2	x
PSME1	Proteasome activator complex subunit 1	12.56	2	7.0	66	24.5	5.4	x
PSME2	proteasome activator complex subunit 2 isoform 2	17.83	3	18.4	213	26.2	5.2	x
PSMA1	proteasome subunit alpha type-1	10.27	2	6.2	47	29.5	6.5	x
PSMA2	proteasome subunit alpha type-2	4.27	1	4.9		25.9	7.4	
PSMA3	proteasome subunit alpha type-3	10.20	2	7.8	109	28.4	5.3	x
PSMA5	proteasome subunit alpha type-5	12.86	2	10.3	72	26.4	4.8	x
PSMA6	proteasome subunit alpha type-6, partial	5.91	1	4.3	74	24.4	6.6	

PSMA7	Proteasome subunit alpha type-7	11.79	2	7.8	86	23.8	8.5	x
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0	x
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5	x
PSMB5	proteasome subunit beta type-5	3.80	1	3.2	42	28.7	7.0	
PSMB6	proteasome subunit beta type-6	8.97	2	6.5	77	24.7	5.1	x
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0	x
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.52	2	5.2	57	40.5	5.6	x
PRMT5	Protein arginine N-methyltransferase 5	1.73	1	3.6	41	66.3	5.7	
CREG1	protein CREG1	9.55	1	3.8		24.1	8.0	
Ctla2b	protein CTLA-2-beta	34.00	2	9.2	91	11.8	5.1	x
CYR61	Protein CYR61	6.50	2	6.9	60	39.1	8.1	x
P4hb	Protein disulfide-isomerase	11.96	2	6.4	74	21.1	4.6	x
PDIA3	Protein disulfide-isomerase A3	5.41	2	9.5	83	50.0	5.7	x
PDIA4	Protein disulfide-isomerase A4	4.83	2	7.2	75	72.5	5.2	x
PDIA6	Protein disulfide-isomerase A6	10.04	2	6.6	77	28.4	4.9	x
PARK7	protein DJ-1	22.22	2	9.9	92	19.9	6.8	x
FAM3C	protein FAM3C	31.72	5	26.5	301	24.7	8.3	x
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3	x
S100A11	protein S100-A11	27.00	2	9.6	66	11.2	7.1	
S100A13	Protein S100-A13	23.47	2	7.3	95	11.2	5.3	x
S100A6	protein S100-A6	19.10	2	8.4	77	10.0	5.5	x
SET	Protein SET	14.53	2	10.7	103	33.3	4.3	x
SHISA5	protein shisa-5	12.81	2	8.1		25.9	6.5	x
TPST1	protein-tyrosine sulfotransferase 1	3.29	1	3.4	47	41.4	9.3	
PNP	Purine nucleoside phosphorylase	7.42	2	10.2	100	31.4	6.7	x
PLBD2	putative phospholipase B 2	31.97	11	83.6	635	65.5	6.3	x
PDXK	Pyridoxal kinase	11.11	1	3.1	67	9.6	10.7	
PKM	pyruvate kinase isozymes M1/M2 isoform 1	14.31	6	20.6	178	57.9	7.3	x
GDI2	rab GDP dissociation inhibitor beta	6.74	2	7.7	82	50.5	6.3	x
RDX	radixin	13.04	3	28.2	197	68.5	6.3	
RANBP1	Ran-specific GTPase-activating protein	11.34	2	6.3		22.6	5.2	x
IQGAP1	Ras GTPase-activating protein IQGAP1	1.29	2	6.3	40	185.6	6.7	x
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.9	60	50.4	5.6	

G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	2.90	1	2.9	53	50.7	5.3	
YPT1	Ras GTP-binding protein YPT1	22.92	2	6.6	80	10.9	5.1	x
RAB11A	ras-related protein Rab-11A isoform 1	5.09	1	2.6		24.4	6.6	
RAB39A	Ras-related protein Rab-39A	12.64	1	3.2	48	10.2	9.5	
RAB7A	ras-related protein Rab-7a	14.98	3	7.8	53	23.5	6.7	x
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.9		20.8	5.8	
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2.92	2	10.2	100	90.9	4.7	x
ATP6AP2	Renin receptor	12.00	3	8.7		33.8	5.2	x
RPA1	Replication protein A 70 kDa DNA-binding subunit	3.39	2	6.1	47	68.5	7.9	
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9	x
RARRES2	Retinoic acid receptor responder protein 2	27.08	2	3.6	47	16.4	9.1	x
SCPEP1	Retinoid-inducible serine carboxypeptidase	9.96	3	16.7	190	50.9	5.7	x
ARHGDIA	Rho GDP-dissociation inhibitor 1	15.20	2	6.6		23.4	5.3	x
RNASE4	ribonuclease 4	36.05	3	16.0	44	17.0	9.3	x
RNH1	Ribonuclease inhibitor	4.33	1	3.4		25.2	4.8	
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7	x
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7	x
SEMA3C	Semaphorin-3C	2.80	2	7.2	78	85.2	8.7	x
SEMA4B	Semaphorin-4B	4.33	2	6.1		49.0	7.2	x
HTRA1	Serine protease HTRA1	41.67	8	35.6	398	34.1	7.2	x
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1	x
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	5.76	2	5.8	40	37.5	6.3	x
SERPINB6	serpin B6 isoform 1	5.29	2	6.9	83	43.1	5.9	x
SERPINH1	Serpin H1	5.76	2	7.4	63	46.5	8.7	x
ESD	S-formylglutathione hydrolase	13.23	2	8.9	60	28.2	6.5	x
SH3BGRL2	SH3 domain-binding glutamic acid-rich protein	20.18	2	6.2	85	12.7	5.1	x
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	13.89	1		55	8.0	6.6	
SIAE	sialate O-acetylesterase	11.45	5	18.7	202	61.4	8.2	x
NEU1	Sialidase-1	6.91	2	7.8	96	36.4	5.5	x
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3	x
SNRPE	small nuclear ribonucleoprotein E	11.96	1	2.6	60	10.8	8.7	

SNRPG	Small nuclear ribonucleoprotein G	13.73	1	2.3		5.7	8.0	
SNRPD2	Small nuclear ribonucleoprotein Sm D2	25.42	3	13.0		13.5	9.8	
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.8	9.0	x
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5	x
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	7.7	65	31.0	7.1	
CANT1	soluble calcium-activated nucleotidase 1	5.75	2	7.1	103	45.2	6.6	x
SORD	sorbitol dehydrogenase	2.24	1	2.8		38.3	7.7	
SPARC	SPARC	25.08	5	32.5	276	34.9	4.8	x
SMPD1	Sphingomyelin phosphodiesterase	6.41	2	7.4	126	66.2	7.0	x
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7	x
U2AF2	Splicing factor U2AF 65 kDa subunit	3.79	1	3.5	42	45.7	4.9	
SFPQ	splicing factor, proline- and glutamine-rich	5.31	2	3.1	57	49.4	7.9	x
STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9	
STIP1	Stress-induced-phosphoprotein 1	6.81	3	10.7	43	62.6	6.8	x
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5	x
Psap	Sulfated glycoprotein 1	17.84	9	67.6	596	58.2	5.5	x
QSOX1	Sulfhydryl oxidase 1	12.02	6	30.8	267	70.3	7.9	x
SULT1C2	sulfotransferase 1C2	4.01	1	2.2		35.3	8.3	
UBE2I	SUMO-conjugating enzyme UBC9	7.59	1	3.4		18.0	8.7	
SOD1	superoxide dismutase	14.88	2	11.5	85	25.9	9.6	x
SBSN	suprabasin	29.00	10	49.1	531	63.3	7.4	x
VAT1	Synaptic vesicle membrane protein VAT-1	15.06	3	11.2	113	28.5	7.6	x
SDC4	syndecan-4	18.81	3	21.6	114	22.2	4.6	x
TCP1	T-complex protein 1 subunit alpha	5.58	2	9.9	141	60.3	6.0	x
CCT2	T-complex protein 1 subunit beta	4.30	2	5.9	48	57.5	6.5	x
CCT4	T-complex protein 1 subunit delta	6.05	2	6.6	51	42.1	8.3	x
CCT5	T-complex protein 1 subunit epsilon isoform 1	4.99	2	10.3	143	59.5	5.5	x
CCT7	T-complex protein 1 subunit eta	4.21	2	5.9	68	54.9	7.4	x
CCT3	T-complex protein 1 subunit gamma	3.85	2	5.5	41	60.6	6.6	x
CCT8	T-complex protein 1 subunit theta	9.57	2	6.7	92	24.8	5.3	x
CCT6A	T-complex protein 1 subunit zeta	4.90	2	5.4		57.9	6.9	x
TXN	thioredoxin	28.92	2	7.9	68	9.1	4.7	x
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5	x

TXNRD1	thioredoxin reductase 1	5.81	2	6.1	64	54.7	6.8	x
ALYREF	THO complex subunit 4	7.01	1	3.4		16.8	10.1	
THBS1	thrombospondin-1	10.94	9	28.9	226	129.6	4.9	x
THBS3	Thrombospondin-3	4.09	2	5.9	54	61.4	4.3	x
FUCA1	Tissue alpha-L-fucosidase	4.37	2	6.5	75	52.8	6.5	x
TFPI	tissue factor pathway inhibitor	3.34	2	3.2	44	34.4	8.2	x
PLAT	Tissue-type plasminogen activator	3.09	1		40	50.8	7.9	
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3	
TALDO1	Transaldolase	17.51	6	23.5	133	37.4	6.7	x
TCEB2	Transcription elongation factor B polypeptide 2	6.78	1	2.3		13.1	5.0	
TAGLN2	transgelin-2	20.60	3	11.4	95	22.4	8.6	x
VCP	Transitional endoplasmic reticulum ATPase	5.83	4	14.1	119	89.3	5.3	x
TKT	transketolase	9.31	3	14.3	102	67.7	7.6	x
TPT1	Translationally-controlled tumor protein	16.20	2	6.6	70	15.9	5.0	x
TPI1	Triosephosphate isomerase	26.67	2	13.9	130	16.4	8.2	x
TPP1	Tripeptidyl-peptidase 1	35.70	12	93.4	880	61.5	6.5	x
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8	x
TPM3	tropomyosin alpha-3 chain isoform 2	10.93	2	8.6	129	28.8	4.8	x
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8	x
TPM2	Tropomyosin beta chain	8.68	2	7.3	71	30.7	4.8	x
TUBA1C	tubulin alpha-1C chain	8.69	3	11.0	105	49.9	5.1	x
TUBB2B	tubulin beta-2B chain	20.54	1	27.0	150	49.6	4.9	
TUBB3	Tubulin beta-3 chain	3.52	1	6.9	71	85.4	6.0	
TUBB4B	tubulin beta-4B chain	19.03	2	15.5	191	41.8	4.9	x
TINAG	tubulointerstitial nephritis antigen	13.55	4	23.4	167	52.5	7.1	x
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	7.7	77	33.6	6.2	
TNFRSF21	Tumor necrosis factor receptor superfamily member 21	4.60	2	7.7		71.3	7.5	
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6	x
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3	x
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0	
UBA1	ubiquitin modifier-activating enzyme 1	2.93	2	7.0		117.6	5.7	x
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0	x
UBE2N	Ubiquitin-conjugating enzyme E2 N	20.39	2	8.0	68	17.1	6.6	x

UBE2V2	ubiquitin-conjugating enzyme E2 variant 2, partial	13.10	2	8.2	52	15.4	4.9	x
UGDH	UDP-glucose 6-dehydrogenase, partial	8.52	2	6.6	74	29.4	7.6	x
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1	
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3	
RAD23B	UV excision repair protein RAD23 homolog B	6.94	3	8.2	71	43.7	4.9	
VPS35	Vacuolar protein sorting-associated protein 35	0.88	1	2.3		91.6	5.4	
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5	
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3	x
VASN	vasorin	13.52	5	32.6	275	72.5	7.5	x
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8	x
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	3.4	85	26.8	7.8	
VIM	vimentin	15.26	6	19.1	138	44.5	4.8	x
VCL	vinculin isoform 1	2.16	2	6.5		116.6	6.0	x
PROS1	Vitamin K-dependent protein S	6.68	4	14.2	145	74.6	5.7	x
ATP6AP1	V-type proton ATPase subunit S1	15.42	5	22.6	179	48.9	6.0	x
WDR1	WD repeat-containing protein 1	5.21	3	8.3	52	58.8	7.1	x
ZNF829	zinc finger protein 829	1.48	1	3.6	77	70.3	8.5	

Table 3.3.36: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to the 37˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	1.34	1	2.3		109.4	5.0
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
RPS4X	40S ribosomal protein S4, X isoform	7.25	2	6.1	41	29.2	10.3
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9
RPL7A	60S ribosomal protein L7a	14.20	2	6.5		19.7	9.7
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	1	6.9	63	28.5	4.1
ACTR2	Actin-related protein 2	8.23	1	5.0		17.7	5.9
ARPC4	Actin-related protein 2/3 complex subunit 4	6.59	1	2.6	40	19.5	8.4
AMPD2	AMP deaminase 2	1.42	1	2.2	50	81.3	6.5
AREG	Amphiregulin	3.48	1	2.6		25.3	8.2
ANG	angiogenin	6.90	1	3.1	42	16.5	9.3
LFNG	beta-1,3-N-acetylglucosaminyltransferase lunatic fringe	3.97	1	3.4	41	41.6	8.7
PNKP	bifunctional polynucleotide phosphatase/kinase	2.68	1	2.6		57.2	8.2
BDNF	Brain-derived neurotrophic factor	6.75	1	3.9		26.6	8.5
CHST11	carbohydrate sulfotransferase 11	6.82	1	3.9		41.6	8.9
N/A	CCHC-type zinc finger	7.93	1	4.3		18.1	7.4
CD81	CD81 antigen isoform 1	6.78	1	2.8		25.8	5.5
CCBE1	Collagen and calcium-binding EGF domain-containing protein 1	4.29	1	2.6		32.5	6.7
C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	9.05	2	5.2	50	25.3	6.4
CFH	complement factor H, partial	4.04	2	7.2	43	72.7	6.7
ABRACL	costars family protein C6orf115 homolog	11.11	1	3.5	52	9.0	5.8
DPP3	dipeptidyl peptidase 3	2.44	2	2.7	46	82.9	5.2
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0
DNAJB9	dnaJ homolog subfamily B member 9	7.21	1	4.8	42	25.6	8.3
DNAJB3	DnaJ subfamily C member 3	1.99	1	3.4	51	57.5	5.8

RAD18	E3 ubiquitin-protein ligase RAD18	2.43	1	2.3		55.8	8.1
EFHD2	EF-hand domain-containing protein D2	25.66	2	4.1	87	12.8	5.4
MAN1B1	endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase, partial	3.86	1		49	56.0	6.4
SGCE	Epsilon-sarcoglycan	3.05	1	2.4		37.1	6.7
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
EIF4A2	eukaryotic initiation factor 4A-II isoform 3	4.17	1	4.7	83	36.2	7.4
EIF3E	Eukaryotic translation initiation factor 3 subunit E	3.42	1	2.4		30.7	6.9
XPO1	exportin-1	2.05	1	5.0		122.9	6.1
FER1L6	Fer-1 protein 6	2.65	1	2.6		36.3	5.2
FTH1	Ferritin heavy chain	20.97	3	14.2	197	21.5	6.2
FLNB	filamin-B isoform 3	0.81	2	6.2		275.1	5.7
FKBP3	FK506-binding protein 3	7.77	1	2.6		10.6	6.8
GGH	Gamma-glutamyl hydrolase	9.96	2	11.8	125	30.9	7.5
USO1	General vesicular transport factor p115	3.42	1	3.0	60	49.6	4.9
GPR56	G-protein coupled receptor 56	1.45	1	2.8	59	77.3	8.8
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	5.1	42	11.3	9.9
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	4.82	1		42	24.5	9.7
N/A	hypothetical protein I79_016815	8.00	1		54	12.8	11.1
N/A	hypothetical protein I79_018775	8.62	1		41	13.1	9.5
N/A	hypothetical protein I79_021924	9.35	1	3.2	40	13.2	4.4
N/A	hypothetical protein LOC100755523	12.50	1	5.6		7.9	7.7
INHBB	inhibin beta B chain	5.35	1	3.8		35.9	7.2
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	2.33	1	3.7	60	55.9	7.3
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
LTBP1	Latent-transforming growth factor beta-binding protein 1	3.89	2	9.0	86	93.7	4.5
LTBP3	latent-transforming growth factor beta-binding protein 3	0.81	1	3.2		146.0	6.4
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4
LOXL1	Lysyl oxidase homolog 1	4.23	1	5.4	76	36.9	6.4
MDP1	Magnesium-dependent phosphatase 1	11.50	1	3.4		12.9	6.5
PRNP	Major prion protein	9.16	1	4.1		15.3	6.8
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA, partial	6.74	3	11.9	129	71.5	6.7

MMP14	Matrix metalloproteinase-14	1.67	1	2.4		60.7	8.5
MBTPS1	Membrane-bound transcription factor site-1 protease	1.85	1	3.0		65.9	9.0
WDR77	Methylosome protein 50	5.30	1	9.3		29.8	4.8
TOMM22	mitochondrial import receptor subunit TOM22 homolog	8.45	1	4.5	76	15.5	4.3
MAPK1	Mitogen-activated protein kinase 1	5.07	2	7.1	41	41.0	7.0
NTN4	Netrin-4	6.27	3	8.7	90	64.0	8.1
SERPINI1	Neuroserpin	8.15	2	4.8		26.6	4.9
SLC1A4	Neutral amino acid transporter A	2.54	1	3.0		41.8	5.1
NCEH1	neutral cholesterol ester hydrolase 1	1.94	1	3.1	50	68.3	7.8
NBR1	Next to BRCA1 gene 1 protein	1.50	1	2.5		95.7	5.6
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
NUTF2	nuclear transport factor 2	11.11	1	4.4		14.4	5.4
GTPBP4	nucleolar GTP-binding protein 1	2.05	1	2.7		74.0	9.5
NIT2	omega-amidase NIT2	3.62	1	2.9	40	30.5	7.4
PPIA	Peptidyl-prolyl cis-trans isomerase A	63.41	8	32.9	211	17.9	8.3
PPID	peptidyl-prolyl cis-trans isomerase D, partial	3.37	1	2.6	50	29.4	6.4
FKBP9	peptidyl-prolyl cis-trans isomerase FKBP9	1.58	1	2.4		63.0	5.1
PIP5K1A	phosphatidylinositol-4-phosphate 5-kinase protein 1	3.54	1	2.3		45.8	9.8
PSPH	Phosphoserine phosphatase	6.38	1	2.4		15.7	6.2
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein	2.73	1	2.4		37.4	7.1
PCBP2	Poly(rC)-binding protein 2	7.79	2	5.9		33.8	8.0
DDX6	probable ATP-dependent RNA helicase DDX6 isoform 1	4.97	1	6.0	51	54.3	8.7
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PSMA4	proteasome subunit alpha type-4	14.56	2	8.6		29.5	7.7
CUTA	Protein CutA	9.79	1	3.5		15.4	5.5
HEG1	protein HEG homolog 1	0.94	1	2.8		113.7	6.2
POMGNT1	protein O-linked-mannose beta-1,2-N-acetylglucosaminyltransferase 1 isoform 2	2.08	1	3.4		71.6	6.6
PPP1R12A	protein phosphatase 1 regulatory subunit 12A	1.23	1	3.5	52	109.5	5.4
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
TANC2	Protein TANC2	0.41	1		50	217.5	7.6
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6

DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.89	1	2.8		61.4	8.6
SLC38A10	putative sodium-coupled neutral amino acid transporter 10 isoform 1	1.01	1	2.7		117.8	5.5
N/A	pyruvate kinase isozymes M1/M2 isoform 2	10.07	4	16.1	138	49.8	6.6
RAC3	ras-related C3 botulinum toxin substrate 3	6.76	1	3.6		16.7	8.6
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	8.43	3	9.7	41	55.5	8.0
SEMA3B	Semaphorin-3B	7.21	2	7.6		37.3	6.8
SEMA3E	Semaphorin-3E	2.57	2	7.1	77	85.2	7.7
PKN1	serine/threonine-protein kinase N1	1.02	1	5.4		109.0	6.6
SLITRK4	SLIT and NTRK protein 4	1.21	1	2.6		92.7	7.9
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	3.42	1		42	40.2	6.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.4	42	22.3	7.9
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1
THOP1	thimet oligopeptidase	6.40	3	8.0	84	78.1	6.0
TXNDC12	Thioredoxin domain-containing protein 12	8.82	1	5.0		19.0	5.8
THBD	Thrombomodulin	4.27	1	4.1		35.4	4.7
THUMPD1	THUMP domain-containing protein 1	3.90	1	2.6		40.3	6.5
PURB	Transcriptional activator protein Pur-beta	10.47	1	2.5		9.6	5.0
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TGFB1	transforming growth factor beta-1, partial	7.35	1	5.3	45	31.2	8.2
TGFB2	Transforming growth factor beta-2	1.55	1	2.3		44.6	8.6
TPM2	tropomyosin beta chain, partial	7.36	1	6.5	47	29.9	4.6
TUBA1A	Tubulin alpha-1A chain	12.90	2		102	20.6	6.2
TUBA4A	tubulin alpha-4A chain	6.24	1	7.5	84	48.3	5.0
TUBB2A	Tubulin beta-2 chain	19.81	2	17.7	159	46.5	5.0
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFRSF12A	tumor necrosis factor receptor superfamily member 12A isoform 1	22.58	1	6.1		13.0	7.6
LSM2	U6 snRNA-associated Sm protein LSm2	12.50	1	3.2		9.9	6.5
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.77	2	5.9	52	42.3	9.3

Table 3.3.37: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to the 31˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8
ADPRH	[Protein ADP-ribosylarginine] hydrolase	3.71	1	4.1	67	38.8	6.3
PSMC6	26S protease regulatory subunit 10B	2.83	1	4.1	66	44.1	7.5
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	2.6		42.3	8.0
RPS15	40S ribosomal protein S15-like	16.96	1	4.5	80	13.0	10.9
FAU	40S ribosomal protein S30	16.95	1	2.4		6.6	12.1
RPL10A	60S ribosomal protein L10a-like	6.19	1	4.9	83	23.4	9.9
RPL11	60S ribosomal protein L11-like, partial	18.18	1	3.7	66	8.8	10.4
RPL13	60S ribosomal protein L13	5.67	1	2.5	44	22.4	11.8
RPL21	60S ribosomal protein L21	8.66	1	2.5		14.7	11.7
RPL26	60S ribosomal protein L26-like	24.14	4	10.6	56	17.2	10.7
RPL27	60S ribosomal protein L27	9.52	1		41	9.4	10.7
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0
RPL31	60S ribosomal protein L31-like, partial	11.29	1	4.4	59	14.3	9.3
RPL8	60S ribosomal protein L8	8.33	1	2.6		14.1	10.6
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	3.40	2	7.0	112	77.3	7.6
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.51	1		49	38.1	5.5
AIMP2	aminoacyl tRNA synthase complex-interacting multifunctional protein 2	7.81	1	5.0		35.4	7.8
ANKS3	ankyrin repeat and SAM domain-containing protein 3	1.68	1	2.3		72.3	5.3
AP1B1	AP-1 complex subunit beta-1-like	1.21	1	2.5		99.6	5.0
AIFM1	apoptosis-inducing factor 1, mitochondrial-like	2.45	1	3.0		66.7	9.0
ARAP2	arf-GAP with Rho-GAP domain, ANK repeat and PH domain-containing protein 2, partial	0.47	1	2.7		169.7	7.3
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	1.21	1	4.2		72.1	6.1
DARS	Aspartyl-tRNA synthetase, cytoplasmic	2.39	1	2.3		47.8	6.3
AKNA	AT-hook-containing transcription factor	1.27	1	2.5		137.0	6.0
ABCF1	ATP-binding cassette sub-family F member 1-like	1.31	1	2.7		95.4	6.5

DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
DDX39A	ATP-dependent RNA helicase DDX39	6.60	3	7.6	60	48.7	5.8
BANF1	barrier-to-autointegration factor	13.48	1	2.7		10.1	6.1
BSG	Basigin	4.02	1	2.6		27.4	5.9
BLVRA	biliverdin reductase A-like	4.75	1	4.8	85	33.2	6.1
CNN2	Calponin-2	5.69	1	3.1		32.5	7.0
CAPRIN1	Caprin-1	3.35	2	5.8	73	73.6	5.2
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
CHMP4B	Charged multivesicular body protein 4b	5.26	1	3.1		21.4	4.7
CBX1	chromobox protein homolog 1	14.59	2	7.7	89	21.4	4.9
CIRBP	Cold-inducible RNA-binding protein	5.98	1	3.5	53	19.8	9.6
COPS4	COP9 signalosome complex subunit 4	2.46	1	3.1	76	46.3	5.8
LAP3	Cytosol aminopeptidase	5.19	2	6.1	48	50.2	6.9
SAT2	diamine acetyltransferase 2-like	4.14	1		47	19.4	7.4
DDB1	DNA damage-binding protein 1-like	0.88	1	2.4		126.8	5.3
APEX1	DNA-(apurinic or apyrimidinic site) lyase	3.47	1	2.9		35.5	8.4
N/A	DNA-binding protein A-like	10.03	1	9.3	122	39.9	10.1
DNAJC8	dnaJ homolog subfamily C member 8-like	3.95	1	3.0		29.8	9.1
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	18.03	1	3.0	50	7.2	9.1
NEDD4	E3 ubiquitin-protein ligase NEDD4-like	2.01	2	5.9	61	108.4	5.7
MAN2B2	Epididymis-specific alpha-mannosidase	1.96	1	4.6	44	111.3	7.5
EIF4A3	Eukaryotic initiation factor 4A-III	3.58	1	2.5		32.4	7.0
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.88	1	3.8		65.3	6.3
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.37	2	15.1	84	91.4	5.1
EIF3L	eukaryotic translation initiation factor 3 subunit L-like	1.77	1	2.7		66.6	6.3
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.20	2	4.9		174.8	5.4
EZR	Ezrin	14.51	3	30.7	161	69.3	6.4
FSIP2	Fibrous sheath-interacting protein 2	0.17	1	2.5		656.4	6.1
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTM5	glutathione S-transferase Mu 5-like	33.92	6	33.7	319	26.9	6.7
Gstm6	glutathione S-transferase Mu 6-like	32.11	5	18.3	159	25.5	6.9
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9
GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4

GSTT2	glutathione S-transferase theta-2-like	5.74	1	3.1		27.8	7.2
Large	glycosyltransferase-like protein LARGE1	2.51	1	2.9		88.0	7.7
NMT2	Glycylpeptide N-tetradecanoyltransferase 2	8.48	1	5.5	72	19.0	5.7
GNG2	guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2-like	10.00	1		41	7.6	7.9
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	4.8		30.5	5.2
H2-D1	h-2 class I histocompatibility antigen, D-B alpha chain-like, partial	6.67	1	3.2	54	21.4	9.2
HSPH1	Heat shock protein 105 kDa	1.29	1	5.0		87.9	5.8
HEBP1	heme-binding protein 1-like	8.42	1		40	21.2	5.3
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	22.92	6	17.1	206	33.1	5.0
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	14.46	4	17.9	65	45.2	7.6
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3
N/A	hypothetical protein I79_015376	2.85	2	9.3	79	231.1	5.6
N/A	hypothetical protein I79_017197	15.79	1	2.4		8.4	7.1
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
IPO4	importin-4	1.02	1	2.2		118.5	5.0
IMPA1	Inositol monophosphatase	4.66	1	3.4	42	25.6	6.8
IAH1	isoamyl acetate-hydrolyzing esterase 1 homolog	6.02	1	3.4		27.8	5.7
IDI1	isopentenyl-diphosphate Delta-isomerase 1-like	5.29	1	3.0		26.3	5.9
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
KRT26	keratin, type I cytoskeletal 26-like, partial	5.20	1	2.2		18.5	7.0
LXN	latexin-like	5.41	1	3.8	83	25.4	6.1
MESDC2	LDLR chaperone MESD-like	4.42	1	2.6		25.1	6.3
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
MRGPRG	mas-related G-protein coupled receptor member G-like	5.52	1	5.1		32.3	8.6
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1
NPTN	neuroplastin	2.68	1	2.5		42.4	8.2
NUDCD2	nudC domain-containing protein 2-like	5.73	1	2.3		17.7	5.1
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8
OSTF1	osteoclast-stimulating factor 1-like	5.61	1	3.4	52	23.7	5.7
PTHLH	Parathyroid hormone-related protein	5.24	1	2.6	42	22.0	10.6
PLIN4	perilipin-4-like	11.52	2	7.9	46	184.1	8.4
PMM2	phosphomannomutase 2-like	4.55	1	2.4		27.7	6.7
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1

PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	3.95	1	2.9	54	25.5	8.6
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
PFDN1	prefoldin subunit 1-like	9.02	1	3.4	60	14.2	6.8
PFDN6	prefoldin subunit 6	7.87	1	2.6		14.4	8.9
PROSC	Proline synthetase co-transcribed bacterial-like protein	7.62	1	3.2		24.8	6.4
PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1
PSMB2	proteasome subunit beta type-2-like	4.98	1	3.0	60	22.8	7.9
PSMB8	Proteasome subunit beta type-8	4.39	1	2.9		25.5	7.1
CNPY2	Protein canopy-like 2	16.49	1	3.8	59	11.0	4.8
FNTB	protein farnesyltransferase subunit beta-like, partial	3.44	1	2.3		55.2	6.1
PCMT1	protein-L-isoaspartate(D-aspartate) O-methyltransferase-like	5.95	1	3.0	52	20.1	8.6
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0
D1Pas1	putative ATP-dependent RNA helicase PI10-like	2.29	1	3.6	47	58.1	7.1
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1
IQGAP2	Ras GTPase-activating-like protein IQGAP2	0.58	1	2.3		177.8	5.6
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RHOC	rho-related GTP-binding protein RhoC precursor	8.81	1	4.0		22.0	6.6
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3
FUS	RNA-binding protein FUS	12.20	2	10.3	75	21.2	10.0
FBLL1	rRNA/tRNA 2'-O-methyltransferase fibrillarin-like protein 1	14.29	1	3.9		10.8	6.8
SEPT11	septin-11-like	4.47	1	5.2	43	49.0	7.0
SEPT9	septin-9	1.77	1	6.4	65	63.7	8.3
STK38	Serine/threonine-protein kinase 38	7.69	1	2.2		15.0	5.4
PPP2R2A	serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	2.41	1	3.9	56	52.9	6.5
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	3.28	1	2.8	49	46.0	7.6
PPP1CB	serine/threonine-protein phosphatase PP1-beta catalytic subunit-like	3.04	1	3.1	41	37.3	7.5
SH2D3C	SH2 domain-containing protein 3C	1.10	1	2.3		90.7	8.5
SMAP	small acidic protein-like	9.34	1	4.6	44	20.1	4.8
SGTA	small glutamine-rich tetratricopeptide repeat-containing protein alpha-like	2.87	1	2.9		34.1	5.0
SPTAN1	Spectrin alpha chain, brain	1.51	3	10.9	61	258.7	5.4

SPIN4	spindlin-4-like	4.02	1	2.4		28.5	8.1
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TES	testin-like isoform 1	2.96	1		51	46.1	7.5
TXNL1	Thioredoxin-like protein 1	5.82	1	2.9		20.8	4.9
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
TANK	TRAF family member-associated NF-kappa-B activator	4.45	1	15.6	97	48.7	5.3
TFAP4	transcription factor AP-4-like	3.25	1	2.4		38.7	6.1
BTF3	Transcription factor BTF3	20.71	1		47	15.4	5.6
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3
TSN	Translin	3.54	1	2.7	60	25.9	8.0
GART	Trifunctional purine biosynthetic protein adenosine-3	0.89	1	2.7		107.5	6.8
TRAIP	TRIP protein	1.69	1	2.9	50	77.1	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	56	14.4	4.8
TTLL12	tubulin--tyrosine ligase-like protein 12	1.56	1	2.6		74.1	5.6
SNRPA1	U2 small nuclear ribonucleoprotein A'	12.63	1	2.3		10.0	8.5
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.80	1	2.9	52	158.1	6.0
N/A	ubc2e ubiquitin conjugating enzyme, isoform CRA_b	10.00	1	2.9		12.6	8.3
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1
C14orf166	UPF0568 protein C14orf166-like	8.18	1	2.7	42	12.3	6.9
C11orf68	UPF0696 protein C11orf68 homolog	4.38	1	2.7		27.5	5.5
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9

Table 3.3.38: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with two or more peptides as being unique to the 37˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7
RPS11	40S ribosomal protein S11	12.03	2	6.0	40	18.3	10.0
RPS12	40S ribosomal protein S12	21.97	2	12.1		14.5	6.7
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2
RPS20	40S ribosomal protein S20	15.00	2	5.6	48	13.4	9.9
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
RPS4X	40S ribosomal protein S4, X isoform	7.25	2	6.1	41	29.2	10.3
RPS9	40S ribosomal protein S9	14.62	2	4.8	56	14.8	10.8
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9
RPL15	60S ribosomal protein L15, partial	10.61	2	7.2	75	23.5	11.6
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3
RPL7A	60S ribosomal protein L7a	14.20	2	6.5		19.7	9.7
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
CRKL	adapter molecule crk	8.56	2	11.9	130	36.1	5.7
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1
MAN2A1	Alpha-mannosidase 2	4.13	2	8.3	92	78.3	8.0
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8
CLN5	Ceroid-lipofuscinosis neuronal protein 5	8.28	2	7.3	56	35.4	7.1
CLTC	clathrin heavy chain 1	1.37	2	7.2	73	191.6	5.8
C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	9.05	2	5.2	50	25.3	6.4
CFH	complement factor H, partial	4.04	2	7.2	43	72.7	6.7
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DPP3	dipeptidyl peptidase 3	2.44	2	2.7	46	82.9	5.2
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1
ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	3.72	2	6.6	64	91.8	7.7
EFHD2	EF-hand domain-containing protein D2	25.66	2	4.1	87	12.8	5.4
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	9.60	2	6.9	42	42.0	5.4
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0

EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7
FTH1	Ferritin heavy chain	20.97	3	14.2	197	21.5	6.2
FLNB	filamin-B isoform 3	0.81	2	6.2		275.1	5.7
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8
GGH	Gamma-glutamyl hydrolase	9.96	2	11.8	125	30.9	7.5
IFI30	gamma-interferon-inducible lysosomal thiol reductase	16.67	2	10.4		27.4	5.2
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	5.1	42	11.3	9.9
CDC37	hsp90 co-chaperone Cdc37	6.86	2	6.9	42	44.4	5.3
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
LTBP1	Latent-transforming growth factor beta-binding protein 1	3.89	2	9.0	86	93.7	4.5
LOXL4	Lysyl oxidase 4	4.49	2	4.8	100	84.7	8.0
KARS	lysyl-tRNA synthetase isoform 1	3.18	2	6.2		67.9	6.2
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA, partial	6.74	3	11.9	129	71.5	6.7
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2
NPPB	natriuretic peptides B	31.40	3	27.3	196	13.4	10.1
NTN4	Netrin-4	6.27	3	8.7	90	64.0	8.1
NCAM1	Neural cell adhesion molecule 1	9.09	2	6.7	64	30.2	5.2
SERPINI1	Neuroserpin	8.15	2	4.8		26.6	4.9
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
PPIA	Peptidyl-prolyl cis-trans isomerase A	63.41	8	32.9	211	17.9	8.3
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8
PLEC	plectin	0.60	2	6.0		533.6	5.9
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5
PSMA4	proteasome subunit alpha type-4	14.56	2	8.6		29.5	7.7
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
S100A11	protein S100-A11	27.00	2	9.6	66	11.2	7.1
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6
N/A	pyruvate kinase isozymes M1/M2 isoform 2	10.07	4	16.1	138	49.8	6.6

RDX	radixin	13.04	3	28.2	197	68.5	6.3
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	8.43	3	9.7	41	55.5	8.0
SEMA3B	Semaphorin-3B	7.21	2	7.6		37.3	6.8
SEMA3E	Semaphorin-3E	2.57	2	7.1	77	85.2	7.7
SNRPD2	Small nuclear ribonucleoprotein Sm D2	25.42	3	13.0		13.5	9.8
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	7.7	65	31.0	7.1
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.4	42	22.3	7.9
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1
STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9
THOP1	thimet oligopeptidase	6.40	3	8.0	84	78.1	6.0
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TUBB2A	Tubulin beta-2 chain	19.81	2	17.7	159	46.5	5.0
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	7.7	77	33.6	6.2
TNFRSF21	Tumor necrosis factor receptor superfamily member 21	4.60	2	7.7		71.3	7.5
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.77	2	5.9	52	42.3	9.3
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5

Table 3.3.39: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with two or more peptides as being unique to the 31˚C culture.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
HSPE1	10 kDa heat shock protein, mitochondrial-like	23.53	2	5.4	81	11.0	9.5
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
PSMD4	26S proteasome non-ATPase regulatory subunit 4	16.84	4	15.2	163	41.1	4.8
RPS19	40S ribosomal protein S19-like, partial	23.53	4	10.2	71	15.1	10.5
RPS21	40S ribosomal protein S21-like	13.25	2	6.1	77	9.1	8.3
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6
RPS26	40S ribosomal protein S26	20.87	2	5.3		13.0	11.0
RPLP1	60S acidic ribosomal protein P1	26.83	2	6.2	53	9.0	5.2
RPL18	60S ribosomal protein L18-like	12.50	2	6.3	78	22.1	11.8
RPL26	60S ribosomal protein L26-like	24.14	4	10.6	56	17.2	10.7
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	3.40	2	7.0	112	77.3	7.6
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	1.85	3	8.7	73	177.6	5.8
NAGLU	alpha-N-acetylglucosaminidase-like	5.68	3	11.5	128	83.4	6.7
DHX9	ATP-dependent RNA helicase A	7.02	8	19.1	148	144.3	6.9
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
DDX39A	ATP-dependent RNA helicase DDX39	6.60	3	7.6	60	48.7	5.8
CAPRIN1	Caprin-1	3.35	2	5.8	73	73.6	5.2
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
CBX1	chromobox protein homolog 1	14.59	2	7.7	89	21.4	4.9
CBX3	chromobox protein homolog 3	16.39	2	11.1	104	20.8	5.3
COL5A1	Collagen alpha-1(V) chain	4.71	2	5.2	54	45.3	5.1
LAP3	Cytosol aminopeptidase	5.19	2	6.1	48	50.2	6.9
PHGDH	d-3-phosphoglycerate dehydrogenase-like	8.82	4	13.8	135	56.5	6.9
NEDD4	E3 ubiquitin-protein ligase NEDD4-like	2.01	2	5.9	61	108.4	5.7
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.37	2	15.1	84	91.4	5.1
EIF3G	eukaryotic translation initiation factor 3 subunit G-like	11.25	3	9.3	44	35.7	5.9
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.20	2	4.9		174.8	5.4
EZR	Ezrin	14.51	3	30.7	161	69.3	6.4
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTM5	glutathione S-transferase Mu 5-like	33.92	6	33.7	319	26.9	6.7
Gstm6	glutathione S-transferase Mu 6-like	32.11	5	18.3	159	25.5	6.9
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9

GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	22.92	6	17.1	206	33.1	5.0
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	14.46	4	17.9	65	45.2	7.6
HNRNPU	heterogeneous nuclear ribonucleoprotein U	6.46	3	11.2	56	69.8	8.9
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3
N/A	hypothetical protein I79_015376	2.85	2	9.3	79	231.1	5.6
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
KRT5	keratin, type II cytoskeletal 5-like	8.40	4	23.0	101	54.4	5.4
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1
NHP2L1	NHP2-like protein 1-like	17.42	2	5.7	49	14.6	8.1
NONO	non-POU domain-containing octamer-binding protein	6.10	2	5.7	51	48.9	8.0
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3-like, partial	11.70	2	8.7	66	21.1	9.3
PLIN4	perilipin-4-like	11.52	2	7.9	46	184.1	8.4
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6
PSMA2	proteasome subunit alpha type-2	32.48	5	20.1	99	25.9	7.4
PSMA6	proteasome subunit alpha type-6-like, partial	19.55	3	7.5	90	24.4	6.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1
PDXK	pyridoxal kinase-like	8.65	2	2.6	64	34.9	6.0
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
RAB11A	ras-related protein Rab-11A isoform 1	9.26	2	5.0		24.4	6.6
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RNH1	ribonuclease inhibitor-like	4.82	2	5.7	54	50.0	4.8
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3
FUS	RNA-binding protein FUS	12.20	2	10.3	75	21.2	10.0
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9
SPTAN1	Spectrin alpha chain, brain	1.51	3	10.9	61	258.7	5.4
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6

SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
TUBB2B	tubulin beta-2B chain-like	28.89	4	51.9	374	49.6	4.9
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1
RAD23B	UV excision repair protein RAD23 homolog B-like	7.85	3	7.8	89	51.7	5.9
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9

Table 3.3.40: HCPs from the cell culture supernatant of a non-producing CHO K1 and an IgG secreting DP12 cell line identified with one or more peptides as being common to both cell lines. Proteins identified with two or more peptides as being common to both cell lines are also indicated.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	4.8	78	11.0	9.5	
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	1.34	1	2.3		109.4	5.0	
YWHAB	14-3-3 protein beta/alpha isoform 2	22.54	3	21.7	241	27.8	4.8	x
YWHAE	14-3-3 protein epsilon, partial	33.33	4	16.5	80	11.9	5.8	x
YWHAH	14-3-3 protein eta	17.89	2	17.9	86	28.2	4.9	x
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0	x
YWHAQ	14-3-3 protein theta	21.63	2	19.3	123	27.7	4.8	x
YWHAZ	14-3-3 protein zeta/delta	17.55	2	11.8	122	27.7	4.8	x
PSMC6	26S protease regulatory subunit 10B	2.83	1	4.1	66	44.1	7.5	
PSMD4	26S proteasome non-ATPase regulatory subunit 4	16.84	4	15.2	163	41.1	4.8	x
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7	
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	2.6		42.3	8.0	
RPS10	40S ribosomal protein S10	4.97	1	2.8	59	20.4	10.1	
RPS11	40S ribosomal protein S11	12.03	2	6.0	40	18.3	10.0	x
RPS12	40S ribosomal protein S12	21.97	2	12.1		14.5	6.7	x
RPS15A	40S ribosomal protein S15a	17.69	2	8.3	66	14.8	10.1	x
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2	
RPS18	40S ribosomal protein S18	28.68	4	12.6	67	15.7	10.4	x
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2	
RPS19	40S ribosomal protein S19, partial	16.91	2	11.9		15.1	10.5	x
RPS2	40S ribosomal protein S2	12.90	2	5.5	40	20.4	9.5	x
RPS20	40S ribosomal protein S20	15.00	2	5.6	48	13.4	9.9	x
RPS21	40S ribosomal protein S21	22.89	2	6.7	51	9.1	8.3	x
RPS25	40S ribosomal protein S25	15.13	2	6.2	56	13.5	10.9	x
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0	
RPS27	40S ribosomal protein S27	22.41	1	3.7	69	6.8	8.0	
RPS3	40S ribosomal protein S3	11.93	2	7.3	66	26.7	9.7	x
FAU	40S ribosomal protein S30	16.95	1	2.4		6.6	12.1	
RPS3A	40S ribosomal protein S3a	7.58	2	8.8	58	29.9	9.7	
RPS3A	40S ribosomal protein S3a, partial	16.83	2	4.7	51	11.4	9.9	x
RPS4X	40S ribosomal protein S4, X isoform	7.25	2	6.1	41	29.2	10.3	x

RPS6	40S ribosomal protein S6	31.34	2	6.2		7.6	5.0	x
RPS8	40S ribosomal protein S8	13.46	2	7.3	47	24.2	10.3	x
RPS9	40S ribosomal protein S9	14.62	2	4.8	56	14.8	10.8	x
RPSA	40S ribosomal protein SA	13.41	2	7.2	61	19.7	9.3	x
SDF4	45 kDa calcium-binding protein	22.82	6	27.6	225	41.2	4.9	x
RPLP0	60S acidic ribosomal protein P0	7.72	2	6.1	43	29.9	8.5	x
RPLP2	60S acidic ribosomal protein P2	25.22	2	8.9	120	11.7	4.5	x
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9	
RPL11	60S ribosomal protein L11	13.17	2	6.2	66	19.0	9.8	x
RPL11	60S ribosomal protein L11-like, partial	18.18	1	3.7	66	8.8	10.4	
RPL12	60S ribosomal protein L12	49.25	3	16.9	121	14.7	9.6	x
RPL13	60S ribosomal protein L13	5.67	1	2.5	44	22.4	11.8	
RPL13A	60S ribosomal protein L13a	9.40	1	2.7	54	13.6	10.6	
RPL15	60S ribosomal protein L15, partial	10.61	2	7.2	75	23.5	11.6	x
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8	
RPL23	60S ribosomal protein L23	25.00	2	9.9	89	14.9	10.5	
RPL23A	60S ribosomal protein L23a	32.84	2	3.3	72	7.6	8.4	x
RPL26	60S ribosomal protein L26-like	24.14	4	10.6	56	17.2	10.7	x
RPL27	60S ribosomal protein L27	9.52	1		41	9.4	10.7	
RPL29	60S ribosomal protein L29	9.65	1	6.0	56	12.4	11.5	
RPL3	60S ribosomal protein L3	7.44	2	7.5	71	46.1	10.2	x
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3	x
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0	
RPL5	60S ribosomal protein L5	9.46	2	6.9		34.2	9.8	x
Rpl6	60S ribosomal protein L6	14.53	2	4.9	41	13.6	9.9	x
RPL7A	60S ribosomal protein L7a	14.20	2	6.5		19.7	9.7	x
RPL8	60S ribosomal protein L8	8.33	1	2.6		14.1	10.6	
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9	
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4.55	2	5.6	45	53.3	6.6	x
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	3.40	2	7.0	112	77.3	7.6	x
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7	1.42	2	7.0	80	177.6	5.8	x
ACAT2	acetyl-CoA acetyltransferase, cytosolic	10.08	2	6.9	100	41.0	7.3	x
ASAH1	Acid ceramidase	11.14	3	11.8	71	44.6	7.9	x
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	1	6.9	63	28.5	4.1	
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0	
ACTA1	actin, alpha skeletal muscle	24.93	1	34.3	212	42.0	5.4	
ACTB	actin, cytoplasmic 1	45.33	5	60.7	531	41.7	5.4	x

ARPC4	Actin-related protein 2/3 complex subunit 4	6.59	1	2.6	40	19.5	8.4	
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	8.0	91	14.4	9.6	x
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.51	1		49	38.1	5.5	
DBI	acyl-CoA-binding protein	32.18	2	5.7	42	10.0	8.8	x
CRKL	adapter molecule crk	8.56	2	11.9	130	36.1	5.7	x
APRT	adenine phosphoribosyltransferase	16.67	2	9.2		19.4	6.0	x
AHCY	adenosylhomocysteinase	4.40	2	5.9	59	47.6	6.5	x
AK2	Adenylate kinase 2, mitochondrial	21.13	2	12.7	49	15.4	7.9	x
ADSL	Adenylosuccinate lyase	4.55	2	4.5		54.9	6.9	x
CAP1	adenylyl cyclase-associated protein 1 isoform 1	6.33	2	7.6	64	51.5	7.3	x
ADM	ADM	22.28	2	9.8	82	20.6	10.2	
ARF1	ADP-ribosylation factor 1, partial	23.08	1	4.1	89	7.3	5.3	
AGRN	agrin isoform 1	1.33	2	8.3	97	217.0	5.8	x
AARS	Alanyl-tRNA synthetase, cytoplasmic	2.73	2	7.3		104.8	5.6	x
AKR1A1	alcohol dehydrogenase	13.27	3	12.6	89	36.5	7.1	x
ADH5	alcohol dehydrogenase class-3	6.68	2	6.5		39.6	7.7	x
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1	
AKR1B1	aldose reductase	8.54	2	8.0	43	35.8	7.4	x
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1	x
ACTN1	Alpha-actinin-1	7.31	2	17.7	239	102.7	5.5	x
ACTN4	Alpha-actinin-4	13.56	2	12.4	154	33.7	4.9	x
ENO1	alpha-enolase	21.21	7	32.4	246	46.7	6.2	x
GLA	Alpha-galactosidase A	13.49	3	11.6	86	38.5	5.0	x
IDUA	alpha-L-iduronidase	4.06	2	2.7	44	72.1	6.8	x
MAN2A1	Alpha-mannosidase 2	4.13	2	8.3	92	78.3	8.0	x
NAGA	alpha-N-acetylgalactosaminidase	22.89	5	29.0	261	47.2	7.8	x
NAGLU	alpha-N-acetylglucosaminidase	2.84	2	3.2	61	83.4	6.7	x
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6	
APP	Amyloid beta A4 protein	24.10	14	75.5	620	84.7	4.8	x
APLP2	Amyloid protein 2	13.48	7	22.5	57	84.8	4.8	x
ANXA1	Annexin A1	13.29	3	13.3	79	38.8	7.0	x
ANXA2	annexin A2, partial	11.89	2	8.4	84	25.4	6.0	x
ANXA5	annexin A5	7.79	2	7.2	69	36.0	5.0	x
AP1B1	AP-1 complex subunit beta-1-like	1.21	1	2.5		99.6	5.0	
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	1.21	1	4.2		72.1	6.1	
ARSA	arylsulfatase A	8.88	2	8.1	94	55.0	5.1	x

GOT1	aspartate aminotransferase, cytoplasmic	6.05	2	7.2	68	46.2	7.2	x
DARS	Aspartyl-tRNA synthetase, cytoplasmic	2.39	1	2.3		47.8	6.3	
ABCF1	ATP-binding cassette sub-family F member 1-like	1.31	1	2.7		95.4	6.5	
DHX9	ATP-dependent RNA helicase A	7.02	8	19.1	148	144.3	6.9	x
DDX39A	ATP-dependent RNA helicase DDX39	6.60	3	7.6	60	48.7	5.8	x
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	23.66	24	450.9	3732	471.6	6.5	x
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8	
B2M	beta-2-microglobulin precursor	27.73	3	53.8	328	13.8	7.4	x
GLB1	Beta-galactosidase	3.38	2	6.0	46	73.6	6.9	x
GUSB	Beta-glucuronidase	8.64	2	8.2		27.9	7.9	x
HEXA	beta-hexosaminidase subunit alpha	5.87	2	7.9	73	60.6	6.5	x
HEXB	Beta-hexosaminidase subunit beta	4.22	2	5.2	44	49.0	6.6	x
ATIC	bifunctional purine biosynthesis protein PURH	3.38	2	5.7		64.6	7.0	x
BLVRA	biliverdin reductase A-like	4.75	1	4.8	85	33.2	6.1	
BTD	biotinidase	5.03	2	7.0	81	60.1	6.1	x
BMP1	bone morphogenetic protein 1	11.78	9	36.1	328	106.1	7.2	x
PRSS22	brain-specific serine protease 4	11.35	3	14.4	103	41.2	7.3	x
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic	2.35	2	7.2	87	101.2	7.8	x
P15156	calcium-dependent serine proteinase	21.29	10	51.6	417	77.4	4.8	x
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3	
CALM1	Calmodulin	15.33	2	7.0	87	16.9	4.2	x
CALR	Calreticulin	9.11	3	10.7	80	48.2	4.5	x
CLSTN1	Calsyntenin-1	9.50	6	32.6	258	92.2	4.8	x
CALU	calumenin	6.03	2	7.4	70	37.0	4.7	x
CAPRIN1	Caprin-1	3.35	2	5.8	73	73.6	5.2	x
CHST11	carbohydrate sulfotransferase 11	6.82	1	3.9		41.6	8.9	
CHST14	carbohydrate sulfotransferase 14	5.59	1	4.1	45	43.0	9.2	
CBR1	Carbonyl reductase	23.24	2	16.9	117	26.7	7.8	x
CAT	catalase	4.74	2	6.7	58	60.0	7.7	x
CTSB	cathepsin B	25.96	7	63.2	564	37.5	6.1	x
CTSD	cathepsin D	14.95	6	22.4	224	44.1	7.0	x
CTSL1	cathepsin L1	30.93	8	47.1	408	37.2	7.2	x
CCL2	c-C motif chemokine 2	11.89	2	13.0	95	15.8	9.2	x
N/A	CCHC-type zinc finger	7.93	1	4.3		18.1	7.4	
ALCAM	CD166 antigen	4.29	2	6.0	75	65.0	6.3	x
CD44	CD44 antigen isoform 5	5.85	2	6.1	65	39.4	5.9	x
CD63	CD63 antigen	4.31	1	3.0	43	25.5	7.6	

CD81	CD81 antigen isoform 1	6.78	1	2.8		25.8	5.5	
CLN5	Ceroid-lipofuscinosis neuronal protein 5	8.28	2	7.3	56	35.4	7.1	x
CLIC1	chloride intracellular channel protein 1	11.20	2	5.8		26.9	5.2	x
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4	x
CSPG4	chondroitin sulfate proteoglycan 4	9.21	15	54.0	446	251.9	5.7	x
CBX1	chromobox protein homolog 1	14.59	2	7.7	89	21.4	4.9	x
CBX3	chromobox protein homolog 3	16.39	2	11.1	104	20.8	5.3	x
CLTC	clathrin heavy chain 1	1.37	2	7.2	73	191.6	5.8	x
CLU	clusterin	37.98	15	155.9	1224	51.5	5.8	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	9.13	2	5.3	44	23.9	9.6	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	11.18	3	12.5	118	38.9	9.4	x
ARCN1	coatomer subunit delta	2.15	1	2.9	57	57.2	6.2	
CFL1	cofilin-1	31.93	3	11.6	60	18.5	8.1	x
CCDC80	coiled-coil domain-containing protein 80	16.14	9	39.6	312	107.4	9.7	x
CIRBP	Cold-inducible RNA-binding protein	5.98	1	3.5	53	19.8	9.6	
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4	
COL6A1	Collagen alpha-1(VI) chain	10.34	7	21.6	179	88.9	6.6	x
COL5A2	Collagen alpha-2(V) chain	5.22	2	6.5	58	40.6	5.9	x
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	9.05	2	5.2	50	25.3	6.4	x
C1ra	Complement C1r-A subcomponent	7.81	4	17.1	208	79.9	6.1	x
C3	Complement C3	4.17	2	5.7	48	59.2	6.6	x
CFH	complement factor H, partial	4.04	2	7.2	43	72.7	6.7	x
COPS4	COP9 signalosome complex subunit 4	2.46	1	3.1	76	46.3	5.8	
CORO1B	coronin-1B	4.55	2	6.2	53	53.8	5.8	x
ABRACL	costars family protein C6orf115 homolog	11.11	1	3.5	52	9.0	5.8	
CAND1	cullin-associated NEDD8-dissociated protein 1	1.91	2	7.6	121	133.5	5.7	x
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8	
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4	
CSRP1	cysteine and glycine-rich protein 1	12.95	2	6.1	45	20.5	8.6	x
CRIP2	cysteine-rich protein 2	10.10	2	6.5	56	22.7	8.6	x
Cycs	cytochrome c, somatic	25.71	2	33.0	199	11.5	9.8	x
LAP3	Cytosol aminopeptidase	5.19	2	6.1	48	50.2	6.9	x
CNDP2	cytosolic non-specific dipeptidase	7.58	3	10.3	78	52.8	5.9	x
PHGDH	d-3-phosphoglycerate dehydrogenase	4.88	2	7.1	82	56.5	6.9	x
DDT	D-dopachrome decarboxylase	24.58	2	5.3	91	13.1	7.1	x

DCN	decorin	33.15	10	111.7	720	40.1	8.4	x
DNASE2	Deoxyribonuclease-2-alpha	11.93	3	14.0	97	38.4	7.3	x
DPT	dermatopontin	9.45	2	5.8	48	24.0	4.9	x
DSTN	destrin	12.12	2	5.6	64	18.6	7.7	x
SAT2	diamine acetyltransferase 2-like	4.14	1		47	19.4	7.4	
DKK3	dickkopf-related protein 3	18.39	4	29.6	392	38.3	4.5	x
DPP7	Dipeptidyl peptidase 2	9.92	4	12.1	72	53.1	6.6	x
DPP3	dipeptidyl peptidase 3	2.44	2	2.7	46	82.9	5.2	x
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	3.49	2	8.3	45	83.8	7.8	x
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0	
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1	
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	3.13	2	7.4		106.2	7.5	x
ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	3.72	2	6.6	64	91.8	7.7	x
DDB1	DNA damage-binding protein 1-like	0.88	1	2.4		126.8	5.3	
DNAJC8	dnaJ homolog subfamily C member 8-like	3.95	1	3.0		29.8	9.1	
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	18.03	1	3.0	50	7.2	9.1	
DAG1	Dystroglycan	8.73	5	24.4	203	96.8	8.5	x
NEDD4	E3 ubiquitin-protein ligase NEDD4-like	2.01	2	5.9	61	108.4	5.7	x
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1	
EFHD2	EF-hand domain-containing protein D2	25.66	2	4.1	87	12.8	5.4	x
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	9.60	2	6.9	42	42.0	5.4	x
EEF1A1	elongation factor 1-alpha 1	20.13	6	33.1	174	50.1	9.0	x
EEF1B2	elongation factor 1-beta	12.44	2	9.7	142	24.7	4.7	x
EEF1D	elongation factor 1-delta isoform 1	12.81	2	3.7	58	31.3	5.1	x
EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0	x
EEF1G	Elongation factor 1-gamma	5.72	2	8.1	94	50.0	6.6	x
EEF2	Elongation factor 2	3.61	3	6.5	84	95.2	6.6	x
HSP90B1	Endoplasmin	10.21	5	17.1	109	92.6	4.8	x
NPC2	epididymal secretory protein E1	14.09	2	8.7		16.5	8.0	x
MAN2B2	Epididymis-specific alpha-mannosidase	1.96	1	4.6	44	111.3	7.5	
EIF4A1	Eukaryotic initiation factor 4A-I	7.52	2	12.5	139	40.8	5.5	x
EIF4A3	Eukaryotic initiation factor 4A-III	3.58	1	2.5		32.4	7.0	
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.88	1	3.8		65.3	6.3	
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	8.89	2	6.1		36.1	5.2	x
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.4	x
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.37	2	15.1	84	91.4	5.1	x
EIF3E	Eukaryotic translation initiation factor 3 subunit E	3.42	1	2.4		30.7	6.9	

EIF3G	eukaryotic translation initiation factor 3 subunit G	4.06	1	3.0		35.7	5.9	
EIF3I	eukaryotic translation initiation factor 3 subunit I	3.69	1	6.4		36.3	5.6	
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7	
EIF3L	eukaryotic translation initiation factor 3 subunit L-like	1.77	1	2.7		66.6	6.3	
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.20	2	4.9		174.8	5.4	x
EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0	x
EIF5A	Eukaryotic translation initiation factor 5A-1	45.45	2	14.1	64	7.2	6.5	x
EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7	x
EXT2	Exostosin 2	9.49	2	7.9	94	35.7	8.6	x
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8	
ECM1	extracellular matrix protein 1	1.60	1	2.7		63.2	6.8	
EZR	Ezrin	14.51	3	30.7	161	69.3	6.4	x
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8	
CAPZB	F-actin-capping protein subunit beta	8.91	2	6.2	78	29.0	7.7	x
FDPS	Farnesyl pyrophosphate synthetase	6.13	2	6.8	62	43.2	7.8	x
FASN	Fatty acid synthase	2.02	2	7.8		206.1	6.7	x
FABP4	fatty acid-binding protein, adipocyte	19.70	2	7.2	46	14.7	7.9	x
FTH1	Ferritin heavy chain	14.05	2	11.9	151	21.4	6.2	x
FN1	fibronectin isoform 2	15.03	24	96.6	672	262.9	5.9	x
FLNB	filamin-B isoform 3	0.81	2	6.2		275.1	5.7	x
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8	x
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3	
FSTL1	follistatin-related protein 1	13.40	3	19.0	186	34.6	5.7	x
ALDOA	fructose-bisphosphate aldolase A isoform 1	7.97	2	8.9	127	39.4	8.1	x
LGALS3	galectin-3	8.05	2	6.1	42	27.2	8.9	x
LGALS3BP	galectin-3-binding protein	12.89	5	15.2	191	63.8	5.2	x
GGH	Gamma-glutamyl hydrolase	9.96	2	11.8	125	30.9	7.5	x
IFI30	gamma-interferon-inducible lysosomal thiol reductase	16.67	2	10.4		27.4	5.2	x
GM2A	ganglioside GM2 activator	16.75	2	7.5	95	20.8	6.7	x
USO1	General vesicular transport factor p115	3.42	1	3.0	60	49.6	4.9	
GPI	glucose-6-phosphate isomerase	4.66	2	7.1	88	63.0	7.6	x
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5	x
GBA	glucosylceramidase	24.66	8	40.0	365	57.4	8.1	x
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7	
GSR	Glutathione reductase, mitochondrial	5.24	2	6.8		45.9	7.0	x
Gsta3	glutathione S-transferase alpha-3	17.65	2	8.8	124	25.4	8.0	x
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4	

GSTM2	glutathione S-transferase Mu 2-like	28.50	5	27.2	402	23.6	5.1	
GSTM5	glutathione S-transferase Mu 5-like	33.92	6	33.7	319	26.9	6.7	x
Gstm6	glutathione S-transferase Mu 6-like	32.11	5	18.3	159	25.5	6.9	x
GSTO1	glutathione S-transferase omega-1 isoform 3	11.06	2	5.0	71	23.5	7.7	x
GSTP1	glutathione S-transferase P 1	48.57	8	31.3	253	23.6	7.8	x
Q00285	glutathione S-transferase Y1	29.36	4	22.0	267	26.0	8.4	x
GSS	glutathione synthetase	11.60	4	14.4	92	52.2	5.6	x
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	37.76	7	38.3	449	36.3	8.5	x
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4	
GARS	Glycyl-tRNA synthetase	1.67	1	3.3	54	74.4	6.4	
GPC1	glypican-1	6.27	3	11.8	169	78.5	7.3	x
GLG1	Golgi apparatus protein 1 precursor	1.72	2	6.1	108	132.2	6.8	x
GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2	x
GPR56	G-protein coupled receptor 56	1.45	1	2.8	59	77.3	8.8	
GRN	granulins isoform 2	4.90	2	9.3	51	63.9	6.4	x
GRN	granulins isoform 3	4.55	2	6.0	54	57.0	6.5	x
RAN	GTP-binding nuclear protein Ran	9.72	2	5.5	58	24.5	7.0	x
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0	x
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	4.8		30.5	5.2	
GNB2L1	Guanine nucleotide-binding protein subunit beta-2 1	13.77	2	7.8	54	30.4	7.4	x
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0	x
Cd74	H-2 class II histocompatibility antigen gamma chain	6.38	2	5.3	47	36.3	8.7	x
HSPA13	Heat shock 70 kDa protein 13	11.89	5	21.9	173	51.9	6.7	x
HSPA4	Heat shock 70 kDa protein 4	9.70	6	22.7	148	93.4	5.2	x
HSPA8	heat shock cognate 71 kDa protein	23.37	11	53.3	532	70.8	5.4	x
HSPH1	Heat shock protein 105 kDa	1.29	1	5.0		87.9	5.8	
HSP90AB1	heat shock protein HSP 90-beta	16.71	10	37.5	235	83.1	5.0	x
HPSE	Heparanase	2.59	1	2.3		43.5	9.4	
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	8.53	2	5.1		23.7	9.6	x
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	5.1	42	11.3	9.9	x
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	17.19	4	19.8	115	34.2	9.2	x
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	24.76	2	11.5	97	12.0	6.1	x
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C 1 isoform 2	11.22	3	6.1	130	32.4	5.1	x
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	22.92	6	17.1	206	33.1	5.0	x
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	14.10	2	11.1	96	25.6	8.6	x
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	8.17	2	6.0		45.8	5.6	
RBMX	heterogeneous nuclear ribonucleoprotein G	9.00	2	7.8	84	31.5	9.8	x

HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	14.46	4	17.9	65	45.2	7.6	x
HNRNPK	heterogeneous nuclear ribonucleoprotein K isoform 4	5.69	2	7.0	50	48.5	5.9	x
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4	
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	3.74	2	6.2	89	62.6	7.6	x
HNRNPU	heterogeneous nuclear ribonucleoprotein U	6.46	3	11.2	56	69.8	8.9	x
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	8.67	2	5.6	44	32.3	9.1	x
HMGB1	High mobility group protein B1	17.50	3	15.7	140	27.8	6.3	x
HMGB2	High mobility group protein B2	5.03	1	2.6		18.2	5.4	
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1	4.2	68	8.0	6.8	
H1F0	Histone H1.0	11.34	2	9.2	108	20.9	10.9	x
HIST1H2AG	Histone H2A type 1	20.24	3	29.4	114	34.2	11.1	x
HIST1H2AG	Histone H2B type 1	26.98	2	10.8	169	13.9	10.3	x
HIST1H3A	Histone H3	19.10	2	28.4	104	29.6	11.1	x
HIST3H3	Histone H3.1t	9.69	1	6.4	167	35.8	10.7	
HIST1H4A	Histone H4	21.36	2	6.5	61	11.4	11.4	x
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3	
RBBP7	histone-binding protein RBBP7	4.35	2	4.7	44	43.6	5.1	x
ST13	Hsc70-interacting protein	18.55	2	5.2	48	13.9	6.8	x
CDC37	hsp90 co-chaperone Cdc37	6.86	2	6.9	42	44.4	5.3	x
HAPLN1	hyaluronan and proteoglycan link protein 1	2.54	1	2.2		40.3	7.8	
HAPLN4	hyaluronan and proteoglycan link protein 4	9.59	3	7.2	120	46.2	8.0	x
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic	4.62	2	5.4		57.3	5.7	x
N/A	hypothetical protein I79_015376	2.85	2	9.3	79	231.1	5.6	x
N/A	hypothetical protein I79_018775	8.62	1		41	13.1	9.5	
N/A	hypothetical protein LOC100766349	10.13	2	6.4	80	25.5	9.9	x
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.2	97	19.7	8.7	x
HPRT1	hypoxanthine-guanine phosphoribosyltransferase	12.15	2	7.8	52	24.2	7.0	x
HYOU1	Hypoxia up-regulated protein 1	2.50	2	5.7	72	111.4	5.2	x
KPNB1	Importin subunit beta-1	4.34	3	9.5	49	97.1	4.8	x
IPO5	importin-5	2.15	2	7.9	134	120.3	4.9	x
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7	
PPA1	Inorganic pyrophosphatase	11.00	2	10.3		34.9	5.6	x
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	2.33	1	3.7	60	55.9	7.3	
IMPA1	Inositol monophosphatase	4.66	1	3.4	42	25.6	6.8	
ISYNA1	Inositol-3-phosphate synthase 1	3.46	1	2.3		50.3	5.6	
IGFBP4	insulin growth factor-binding protein 4	15.35	3	12.2	40	27.7	7.1	x
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	26.89	20	94.0	618	106.5	8.3	x

IFNAR2	Interferon-alpha/beta receptor beta chain	8.30	2	7.4	87	28.7	5.6	x
ILF2	interleukin enhancer-binding factor 2	6.15	2	7.6	105	43.0	5.3	x
ILF3	interleukin enhancer-binding factor 3	3.23	3	8.4	63	95.8	8.7	x
IL1R1	Interleukin-1 receptor 1	11.18	5	43.3	227	37.6	9.0	x
IDH1	isocitrate dehydrogenase	5.56	2	7.4	119	46.7	7.0	x
IDI1	isopentenyl-diphosphate Delta-isomerase 1-like	5.29	1	3.0		26.3	5.9	
KRT10	Keratin, type I cytoskeletal 10	12.35	3	7.1	120	27.8	4.5	x
KRT26	keratin, type I cytoskeletal 26-like, partial	5.20	1	2.2		18.5	7.0	
KRT77	Keratin, type II cytoskeletal 1b	5.39	2	10.8	113	93.4	5.5	x
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1	
KRT71	Keratin, type II cytoskeletal 71	4.41	2	26.1	157	133.3	6.6	x
MFGE8	Lactadherin	27.63	9	44.2	467	47.1	7.9	x
MFGE8	lactadherin, partial	11.37	3	10.2	172	32.3	5.7	x
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1	x
LMNA	Lamin-A/C	6.04	3	10.0	101	64.0	8.0	x
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9	x
LAMA5	laminin subunit alpha-5 isoform 1	15.98	44	183.9	1491	405.6	6.9	x
LAMB1	Laminin subunit beta-1	18.21	32	120.1	838	202.0	4.9	x
LAMC1	Laminin subunit gamma-1	17.82	19	78.5	695	170.3	5.1	x
N/A	Lamin-L(I)	2.28	1	3.1	53	54.9	4.9	
LTBP1	Latent-transforming growth factor beta-binding protein 1	3.89	2	9.0	86	93.7	4.5	x
MESDC2	LDLR chaperone MESD-like	4.42	1	2.6		25.1	6.3	
LGMN	legumain	33.33	9	76.3	618	49.6	6.6	x
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9	
SERPINB1	Leukocyte elastase inhibitor A	6.33	2	7.3		42.9	6.2	x
LASP1	LIM and SH3 domain protein 1	19.38	4	13.8	86	25.8	5.9	x
LPL	Lipoprotein lipase	46.67	16	171.0	1083	50.5	7.9	x
LDHA	L-lactate dehydrogenase A chain	8.13	2	10.6	148	36.5	7.4	x
LDLR	low-density lipoprotein receptor precursor	4.57	3	11.5	143	94.5	4.9	x
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4	
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase	7.05	2	8.4	96	45.6	7.7	x
GAA	lysosomal alpha-glucosidase	13.91	9	29.1	241	105.8	6.0	x
MAN2B1	Lysosomal alpha-mannosidase	3.07	2	3.8	82	88.8	7.7	x
CTSA	Lysosomal protective protein	11.16	4	22.7	176	54.2	6.1	x
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	8.6	75	55.4	6.7	x
LOXL4	Lysyl oxidase 4	4.49	2	4.8	100	84.7	8.0	x
LOXL3	Lysyl oxidase homolog 3	12.81	2	8.7		23.5	6.4	x

KARS	lysyl-tRNA synthetase isoform 1	3.18	2	6.2		67.9	6.2	x
CSF1	macrophage colony-stimulating factor 1 isoform 2	7.39	2	6.4		29.5	7.4	x
MIF	macrophage migration inhibitory factor	17.39	2	3.0	185	12.4	7.3	x
CAPG	Macrophage-capping protein	7.87	2	6.1	67	33.3	5.8	x
MDH1	malate dehydrogenase, cytoplasmic	14.07	3	11.6	57	36.4	6.6	x
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7	
EPDR1	Mammalian ependymin-related protein 1	9.96	2	6.6	82	27.5	6.7	x
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	4.67	2	7.1	119	56.0	6.5	x
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA, partial	6.74	3	11.9	129	71.5	6.7	x
MMP19	matrix metalloproteinase-19	31.43	11	53.4	439	58.9	7.9	x
MMP9	matrix metalloproteinase-9	10.00	6	20.0	104	78.8	5.9	x
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8	
TIMP1	metalloproteinase inhibitor 1	17.24	3	45.1	427	22.4	8.5	x
TIMP2	Metalloproteinase inhibitor 2	15.59	2	11.4	158	20.9	6.7	x
CLNS1A	methylosome subunit pICln	5.51	1	4.1	80	26.1	4.1	
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0	
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0	
MAP6	microtubule-associated protein 6, partial	7.56	1	2.3		50.2	9.2	
MSN	moesin	3.36	2	5.9	80	66.5	6.3	x
PAICS	Multifunctional protein ADE2	12.64	1	2.9	64	9.5	7.9	
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2	
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1	
MYL6	Myosin light polypeptide 6	19.08	2	7.8	62	17.3	4.6	x
MTPN	myotrophin	17.53	1	4.1	57	10.4	6.5	
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 1	21.68	3	16.3	237	37.2	7.5	x
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	14.98	4	15.9	142	34.2	6.9	x
GNS	N-acetylglucosamine-6-sulfatase	6.75	3	8.9		53.7	6.9	x
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.23	2	12.6	175	47.5	7.5	x
NACA	nascent polypeptide-associated complex subunit alpha	13.49	2	9.8	143	23.4	4.6	x
NPPB	natriuretic peptides B	31.40	3	27.3	196	13.4	10.1	x
NEO1	Neogenin	1.94	2	6.0	57	113.1	7.1	x
NTN4	Netrin-4	6.27	3	8.7	90	64.0	8.1	x
NCAM1	Neural cell adhesion molecule 1	9.09	2	6.7	64	30.2	5.2	x
NBL1	neuroblastoma suppressor of tumorigenicity 1	3.93	1	2.0		19.1	5.0	
NRP1	neuropilin-1	1.41	1	3.3	56	103.0	5.9	
SERPINI1	Neuroserpin	8.15	2	4.8		26.6	4.9	x
GANAB	neutral alpha-glucosidase AB isoform 2	3.18	2	7.5		106.9	6.0	x

NCEH1	neutral cholesterol ester hydrolase 1	1.94	1	3.1	50	68.3	7.8	
NHP2L1	NHP2 protein 1	16.44	1	2.9	62	8.0	7.9	
NID1	Nidogen-1	40.32	34	284.9	2709	136.1	5.1	x
Nid1	nidogen-1, partial	61.41	12	170.2	1070	54.6	6.4	x
NONO	non-POU domain-containing octamer-binding protein	6.10	2	5.7	51	48.9	8.0	x
NSFL1C	NSFL1 cofactor p47 isoform 2	7.57	2	8.3	82	40.7	5.1	x
SGSH	N-sulphoglucosamine sulphohydrolase	6.18	2	7.0	89	56.5	6.5	x
NASP	nuclear autoantigenic sperm protein	1.30	1	2.8		83.4	4.4	
NUDC	Nuclear migration protein nudC	9.22	2	7.2		32.8	6.0	x
YBX1	Nuclease-sensitive element-binding protein 1	16.90	2	9.0	153	32.7	10.1	x
NUCB1	Nucleobindin-1	40.25	10	50.2	427	38.2	5.7	x
NUCB2	nucleobindin-2	31.43	13	58.5	490	50.3	5.1	x
NCL	Nucleolin	5.85	3	7.9	47	52.4	4.5	x
NPM1	Nucleophosmin	8.21	2	6.0	78	31.0	4.7	x
NME1	nucleoside diphosphate kinase A isoform 1	21.05	2	8.2		17.2	6.3	x
NME2	nucleoside diphosphate kinase B	28.29	2	10.9	137	17.3	8.0	x
NAP1L4	Nucleosome assembly protein 1 4	11.01	2	11.4	78	39.4	4.7	x
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8	
OLFML3	Olfactomedin protein 3	18.47	7	28.9	195	45.9	6.2	x
NIT2	omega-amidase NIT2	3.62	1	2.9	40	30.5	7.4	
OSTF1	osteoclast-stimulating factor 1-like	5.61	1	3.4	52	23.7	5.7	
OAF	Out at first protein homolog	35.92	6	37.8	230	23.8	8.0	x
PPT1	palmitoyl-protein thioesterase 1	7.84	2	2.5	44	34.5	7.9	x
VNN1	Pantetheinase	5.27	2	7.4	131	56.7	5.5	x
PDLIM1	PDZ and LIM domain protein 1	3.65	1	3.2		35.9	7.1	
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	7.29	4	11.0	100	94.7	6.5	x
PPIA	Peptidyl-prolyl cis-trans isomerase	25.61	4	13.0	180	17.9	8.3	x
PPIA	Peptidyl-prolyl cis-trans isomerase A	63.41	8	32.9	211	17.9	8.3	x
PPIB	peptidyl-prolyl cis-trans isomerase B	37.04	8	42.7	441	23.6	9.6	x
PPIC	Peptidyl-prolyl cis-trans isomerase C	19.38	2	8.1	95	17.5	6.4	x
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	28.70	2	9.7	88	11.9	8.7	
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3, partial	15.43	2	6.7		21.1	9.3	x
FKBP9	peptidyl-prolyl cis-trans isomerase FKBP9	1.58	1	2.4		63.0	5.1	
PLIN4	perilipin-4-like	11.52	2	7.9	46	184.1	8.4	x
PXDN	peroxidasin homolog	14.85	17	79.3	766	165.3	7.0	x
PRDX1	Peroxiredoxin-1	47.24	10	59.5	462	22.2	7.7	x
PRDX4	peroxiredoxin-4	8.50	2	13.7	144	38.8	8.4	x

PRDX6	peroxiredoxin-6, partial	12.79	2	6.6	70	24.5	6.8	x
PEBP1	Phosphatidylethanolamine-binding protein 1	16.58	2	4.0	87	20.9	7.1	x
PGM1	Phosphoglucomutase-1	2.23	1	3.6	84	58.5	5.6	
PGM2	phosphoglucomutase-2	2.10	1	3.4	80	69.0	6.3	
PGK1	phosphoglycerate kinase 1	5.28	2	5.8	41	44.5	7.9	x
PGAM1	Phosphoglycerate mutase 1	14.61	2	3.4	95	20.2	8.1	x
PLTP	Phospholipid transfer protein	10.89	4		210	50.6	6.0	x
PSPH	Phosphoserine phosphatase	6.38	1	2.4		15.7	6.2	
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein	2.73	1	2.4		37.4	7.1	
SERPINF1	Pigment epithelium-derived factor	22.73	6	19.0	192	46.4	6.9	x
PIR	pirin	7.59	2	10.6	108	32.1	6.5	x
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2	9.5	69	44.1	10.3	x
PLS3	plastin-3	5.24	3	10.6	129	70.8	5.7	x
PLA2G7	Platelet-activating factor acetylhydrolase	9.62	2	10.0	105	38.2	8.7	x
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8	x
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3	
PLEC	plectin	0.60	2	6.0		533.6	5.9	x
PCBP2	Poly(rC)-binding protein 2	7.79	2	5.9		33.8	8.0	
PCBP2	poly(rC)-binding protein 2 isoform 4	9.63	2	8.3	65	33.9	8.2	x
PABPC1	Polyadenylate-binding protein 1	5.84	2	6.3	40	62.7	9.6	x
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9	
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	3.3	59	23.2	8.8	
N/A	polyubiquitin	32.81	2	4.8		42.9	7.6	x
PFDN1	prefoldin subunit 1-like	9.02	1	3.4	60	14.2	6.8	
PFDN2	Prefoldin subunit 2	11.69	1		45	8.4	8.2	
TSR2	Pre-rRNA-processing protein TSR2	13.45	1	4.9	66	13.2	4.4	
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	6.4	63	69.2	8.9	x
CTSH	pro-cathepsin H	7.81	2	6.3	51	37.4	8.5	x
PCOLCE	procollagen C-endopeptidase enhancer 1	24.15	7	43.7	326	50.4	7.9	x
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	7.15	4	15.9	139	83.7	6.6	x
PFN1	Profilin-1	20.00	2	6.9		14.9	8.3	x
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1	
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5	x
PA2G4	Proliferation-associated protein 2G4	7.55	2	6.8		41.1	8.0	x
PROSC	Proline synthetase co-transcribed bacterial-like protein	7.62	1	3.2		24.8	6.4	
PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6	
PTGR1	prostaglandin reductase 1	10.94	2	7.2	60	35.7	7.2	x

PSME1	Proteasome activator complex subunit 1	12.56	2	7.0	66	24.5	5.4	x
PSME2	proteasome activator complex subunit 2 isoform 2	17.83	3	18.4	213	26.2	5.2	x
PSMA1	proteasome subunit alpha type-1	10.27	2	6.2	47	29.5	6.5	x
PSMA2	proteasome subunit alpha type-2	32.48	5	20.1	99	25.9	7.4	x
PSMA3	proteasome subunit alpha type-3	10.20	2	7.8	109	28.4	5.3	x
PSMA4	proteasome subunit alpha type-4	14.56	2	8.6		29.5	7.7	x
PSMA5	proteasome subunit alpha type-5	12.86	2	10.3	72	26.4	4.8	x
PSMA6	proteasome subunit alpha type-6, partial	5.91	1	4.3	74	24.4	6.6	
PSMA7	Proteasome subunit alpha type-7	11.79	2	7.8	86	23.8	8.5	x
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1	
PSMB2	proteasome subunit beta type-2-like	4.98	1	3.0	60	22.8	7.9	
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0	
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5	
PSMB5	proteasome subunit beta type-5	3.80	1	3.2	42	28.7	7.0	
PSMB6	proteasome subunit beta type-6	8.97	2	6.5	77	24.7	5.1	x
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0	x
PSMB8	Proteasome subunit beta type-8	4.39	1	2.9		25.5	7.1	
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.52	2	5.2	57	40.5	5.6	x
PRMT5	Protein arginine N-methyltransferase 5	1.73	1	3.6	41	66.3	5.7	
CNPY2	Protein canopy-like 2	16.49	1	3.8	59	11.0	4.8	
CREG1	protein CREG1	9.55	1	3.8		24.1	8.0	
Ctla2b	protein CTLA-2-beta	34.00	2	9.2	91	11.8	5.1	x
CYR61	Protein CYR61	6.50	2	6.9	60	39.1	8.1	x
P4hb	Protein disulfide-isomerase	11.96	2	6.4	74	21.1	4.6	x
PDIA3	Protein disulfide-isomerase A3	5.41	2	9.5	83	50.0	5.7	x
PDIA4	Protein disulfide-isomerase A4	4.83	2	7.2	75	72.5	5.2	x
PDIA6	Protein disulfide-isomerase A6	10.04	2	6.6	77	28.4	4.9	x
PARK7	protein DJ-1	22.22	2	9.9	92	19.9	6.8	x
FAM3C	protein FAM3C	31.72	5	26.5	301	24.7	8.3	x
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3	
S100A11	protein S100-A11	27.00	2	9.6	66	11.2	7.1	x
S100A13	Protein S100-A13	23.47	2	7.3	95	11.2	5.3	x
S100A6	protein S100-A6	19.10	2	8.4	77	10.0	5.5	x
SET	Protein SET	14.53	2	10.7	103	33.3	4.3	x
SHISA5	protein shisa-5	12.81	2	8.1		25.9	6.5	x
TANC2	Protein TANC2	0.41	1		50	217.5	7.6	
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0	

PNP	Purine nucleoside phosphorylase	7.42	2	10.2	100	31.4	6.7	x
D1Pas1	putative ATP-dependent RNA helicase Pl10-like	2.29	1	3.6	47	58.1	7.1	
PLBD2	putative phospholipase B 2	31.97	11	83.6	635	65.5	6.3	x
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.89	1	2.8		61.4	8.6	
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1	
LUC7L2	putative RNA-binding protein Luc7-like 2 isoform 3	4.56	1	5.1	66	39.4	10.1	
PDXK	Pyridoxal kinase	12.81	2	3.1	111	27.0	5.5	x
PKM	pyruvate kinase isozymes M1/M2 isoform 1	14.31	6	20.6	178	57.9	7.3	x
N/A	pyruvate kinase isozymes M1/M2 isoform 2	10.07	4	16.1	138	49.8	6.6	x
GDI2	rab GDP dissociation inhibitor beta	6.74	2	7.7	82	50.5	6.3	x
RDX	radixin	13.04	3	28.2	197	68.5	6.3	x
RANBP1	Ran-specific GTPase-activating protein	11.34	2	6.3		22.6	5.2	x
IQGAP1	Ras GTPase-activating protein IQGAP1	1.29	2	6.3	40	185.6	6.7	x
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.9	60	50.4	5.6	
YPT1	Ras GTP-binding protein YPT1	22.92	2	6.6	80	10.9	5.1	x
RAB11A	ras-related protein Rab-11A isoform 1	9.26	2	5.0		24.4	6.6	x
RAB5A	ras-related protein Rab-5A	5.12	1	2.6		23.5	8.1	
RAB7A	ras-related protein Rab-7a	14.98	3	7.8	53	23.5	6.7	x
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.9		20.8	5.8	
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2.92	2	10.2	100	90.9	4.7	x
ATP6AP2	Renin receptor	12.00	3	8.7		33.8	5.2	x
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8	
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	8.43	3	9.7	41	55.5	8.0	x
RARRES2	Retinoic acid receptor responder protein 2	27.08	2	3.6	47	16.4	9.1	x
SCPEP1	Retinoid-inducible serine carboxypeptidase	9.96	3	16.7	190	50.9	5.7	x
ARHGDIA	Rho GDP-dissociation inhibitor 1	15.20	2	6.6		23.4	5.3	x
RHOC	rho-related GTP-binding protein RhoC precursor	8.81	1	4.0		22.0	6.6	
RNASE4	ribonuclease 4	36.05	3	16.0	44	17.0	9.3	x
RNH1	ribonuclease inhibitor	4.82	2	6.0	69	50.0	4.8	x
PRPS1	ribose-phosphate pyrophosphokinase 1-like	6.60	2	5.8	53	34.7	6.8	
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7	
RRBP1	ribosome-binding protein 1	0.89	1	3.4		158.2	9.0	
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7	
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3	
FUS	RNA-binding protein FUS	12.20	2	10.3	75	21.2	10.0	x
SEMA3B	Semaphorin-3B	7.21	2	7.6		37.3	6.8	x
SEMA3C	Semaphorin-3C	2.80	2	7.2	78	85.2	8.7	x

SEMA3E	Semaphorin-3E	2.57	2	7.1	77	85.2	7.7	x
SEMA4B	Semaphorin-4B	4.33	2	6.1		49.0	7.2	x
SEPT11	septin-11-like	4.47	1	5.2	43	49.0	7.0	
SEPT9	septin-9	1.77	1	6.4	65	63.7	8.3	
HTRA1	Serine protease HTRA1	41.67	8	35.6	398	34.1	7.2	x
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1	x
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	5.76	2	5.8	40	37.5	6.3	x
SERPINB6	serpin B6 isoform 1	5.29	2	6.9	83	43.1	5.9	x
SERPINH1	Serpin H1	5.76	2	7.4	63	46.5	8.7	x
ESD	S-formylglutathione hydrolase	13.23	2	8.9	60	28.2	6.5	x
SH2D3C	SH2 domain-containing protein 3C	1.10	1	2.3		90.7	8.5	
SH3BGRL2	SH3 domain-binding glutamic acid-rich protein	20.18	2	6.2	85	12.7	5.1	x
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	13.89	1		55	8.0	6.6	
SIAE	sialate O-acetylesterase	11.45	5	18.7	202	61.4	8.2	x
NEU1	Sialidase-1	6.91	2	7.8	96	36.4	5.5	x
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3	
SLITRK4	SLIT and NTRK protein 4	1.21	1	2.6		92.7	7.9	
SGTA	small glutamine-rich tetratricopeptide repeat-containing protein alpha-like	2.87	1	2.9		34.1	5.0	
SNRPD2	Small nuclear ribonucleoprotein Sm D2	25.42	3	13.0		13.5	9.8	x
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.8	9.0	x
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5	
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	7.7	65	31.0	7.1	x
CANT1	soluble calcium-activated nucleotidase 1	5.75	2	7.1	103	45.2	6.6	x
SORD	sorbitol dehydrogenase	2.24	1	2.8		38.3	7.7	
SPARC	SPARC	25.08	5	32.5	276	34.9	4.8	x
SPTAN1	Spectrin alpha chain, brain	1.51	3	10.9	61	258.7	5.4	x
SMPD1	Sphingomyelin phosphodiesterase	6.41	2	7.4	126	66.2	7.0	x
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7	
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6	
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7	x
U2AF2	Splicing factor U2AF 65 kDa subunit	3.79	1	3.5	42	45.7	4.9	
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.4	42	22.3	7.9	x
SFPQ	splicing factor, proline- and glutamine-rich	5.31	2	3.1	57	49.4	7.9	x
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1	

STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9	x
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2	
STIP1	Stress-induced-phosphoprotein 1	6.81	3	10.7	43	62.6	6.8	x
Psap	Sulfated glycoprotein 1	17.84	9	67.6	596	58.2	5.5	x
QSOX1	Sulfhydryl oxidase 1	12.02	6	30.8	267	70.3	7.9	x
SULT1C2	sulfotransferase 1C2	4.01	1	2.2		35.3	8.3	
SOD1	superoxide dismutase	14.88	2	11.5	85	25.9	9.6	x
SBSN	suprabasin	29.00	10	49.1	531	63.3	7.4	x
VAT1	Synaptic vesicle membrane protein VAT-1	15.06	3	11.2	113	28.5	7.6	x
SDC4	syndecan-4	18.81	3	21.6	114	22.2	4.6	x
TCP1	T-complex protein 1 subunit alpha	5.58	2	9.9	141	60.3	6.0	x
CCT2	T-complex protein 1 subunit beta	4.30	2	5.9	48	57.5	6.5	x
CCT4	T-complex protein 1 subunit delta	6.05	2	6.6	51	42.1	8.3	x
CCT5	T-complex protein 1 subunit epsilon isoform 1	4.99	2	10.3	143	59.5	5.5	x
CCT7	T-complex protein 1 subunit eta	4.21	2	5.9	68	54.9	7.4	x
CCT3	T-complex protein 1 subunit gamma	3.85	2	5.5	41	60.6	6.6	x
CCT8	T-complex protein 1 subunit theta	9.57	2	6.7	92	24.8	5.3	x
CCT6A	T-complex protein 1 subunit zeta	4.90	2	5.4		57.9	6.9	x
THOP1	thimet oligopeptidase	6.40	3	8.0	84	78.1	6.0	x
TXN	thioredoxin	28.92	2	7.9	68	9.1	4.7	x
TXNRD1	thioredoxin reductase 1	5.81	2	6.1	64	54.7	6.8	x
THBS1	thrombospondin-1	10.94	9	28.9	226	129.6	4.9	x
THBS3	Thrombospondin-3	4.09	2	5.9	54	61.4	4.3	x
FUCA1	Tissue alpha-L-fucosidase	4.37	2	6.5	75	52.8	6.5	x
TFPI	tissue factor pathway inhibitor	3.34	2	3.2	44	34.4	8.2	x
PLAT	Tissue-type plasminogen activator	3.09	1		40	50.8	7.9	
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3	
TANK	TRAF family member-associated NF-kappa-B activator	4.45	1	15.6	97	48.7	5.3	
TALDO1	Transaldolase	17.51	6	23.5	133	37.4	6.7	x
TCEB2	Transcription elongation factor B polypeptide 2	6.78	1	2.3		13.1	5.0	
BTF3	Transcription factor BTF3	20.71	1		47	15.4	5.6	
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3	
TAGLN2	transgelin-2	20.60	3	11.4	95	22.4	8.6	x
VCP	Transitional endoplasmic reticulum ATPase	5.83	4	14.1	119	89.3	5.3	x
TKT	transketolase	9.31	3	14.3	102	67.7	7.6	x
TPT1	Translationally-controlled tumor protein	16.20	2	6.6	70	15.9	5.0	x
TSN	Translin	3.54	1	2.7	60	25.9	8.0	

GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	5.7	44	107.5	6.8	x
TPI1	Triosephosphate isomerase	26.67	2	13.9	130	16.4	8.2	x
TPP1	Tripeptidyl-peptidase 1	35.70	12	93.4	880	61.5	6.5	x
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8	x
TPM3	tropomyosin alpha-3 chain isoform 2	10.93	2	8.6	129	28.8	4.8	x
TPM2	Tropomyosin beta chain	8.68	2	7.3	71	30.7	4.8	x
TPM2	tropomyosin beta chain, partial	7.36	1	6.5	47	29.9	4.6	
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	56	14.4	4.8	
TUBA1A	Tubulin alpha-1A chain	12.90	2		102	20.6	6.2	
TUBA1C	tubulin alpha-1C chain	8.69	3	11.0	105	49.9	5.1	x
TUBB2A	Tubulin beta-2 chain	19.81	2	17.7	159	46.5	5.0	x
TUBB2B	tubulin beta-2B chain	29.57	3	347.3	41	49.6	4.9	x
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0	
TUBB4B	tubulin beta-4B chain	19.03	2	15.5	191	41.8	4.9	x
TTLL12	tubulin--tyrosine ligase-like protein 12	1.56	1	2.6		74.1	5.6	
TINAG	tubulointerstitial nephritis antigen	13.55	4	23.4	167	52.5	7.1	x
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	7.7	77	33.6	6.2	x
TNFRSF21	Tumor necrosis factor receptor superfamily member 21	4.60	2	7.7		71.3	7.5	x
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3	
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0	x
SNRPA1	U2 small nuclear ribonucleoprotein A'	12.63	1	2.3		10.0	8.5	
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.80	1	2.9	52	158.1	6.0	
LSM2	U6 snRNA-associated Sm protein LSm2	12.50	1	3.2		9.9	6.5	
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1	
UBA1	ubiquitin modifier-activating enzyme 1	2.93	2	7.0		117.6	5.7	x
UBE2N	Ubiquitin-conjugating enzyme E2 N	20.39	2	8.0	68	17.1	6.6	x
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2, partial	13.10	2	8.2	52	15.4	4.9	x
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.77	2	5.9	52	42.3	9.3	x
UGDH	UDP-glucose 6-dehydrogenase, partial	8.52	2	6.6	74	29.4	7.6	x
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1	x
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4	
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1	
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3	x
C14orf166	UPF0568 protein C14orf166-like	8.18	1	2.7	42	12.3	6.9	
RAD23B	UV excision repair protein RAD23 homolog B	6.94	3	8.2	71	43.7	4.9	x
VPS35	Vacuolar protein sorting-associated protein 35	0.88	1	2.3		91.6	5.4	
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5	

VASN	vasorin	13.52	5	32.6	275	72.5	7.5	
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	3.4	85	26.8	7.8	
VIM	vimentin	15.26	6	19.1	138	44.5	4.8	x
VCL	vinculin isoform 1	2.16	2	6.5		116.6	6.0	x
PROS1	Vitamin K-dependent protein S	6.68	4	14.2	145	74.6	5.7	x
ATP6AP1	V-type proton ATPase subunit S1	15.42	5	22.6	179	48.9	6.0	x
WDR1	WD repeat-containing protein 1	5.21	3	8.3	52	58.8	7.1	x

Table 3.3.41: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
ADPRH	[Protein ADP-ribosylarginine] hydrolase	3.71	1	4.1	67	38.8	6.3
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
PSMD6	26S proteasome non-ATPase regulatory subunit 6	2.83	1	3.6	61	45.5	5.6
RPS15	40S ribosomal protein S15-like	16.96	1	4.5	80	13.0	10.9
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4
RPL10A	60S ribosomal protein L10a-like	6.19	1	4.9	83	23.4	9.9
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8
RPL21	60S ribosomal protein L21	8.66	1	2.5		14.7	11.7
RPL31	60S ribosomal protein L31-like, partial	11.29	1	4.4	59	14.3	9.3
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
ACTR2	Actin-related protein 2	8.23	1	5.0		17.7	5.9
ARF1	ADP-ribosylation factor 1	18.23	2	8.6	104	20.7	6.3
AIMP2	aminoacyl tRNA synthase complex-interacting multifunctional protein 2	7.81	1	5.0		35.4	7.8
AMPD2	AMP deaminase 2	1.42	1	2.2	50	81.3	6.5
AREG	Amphiregulin	3.48	1	2.6		25.3	8.2
ANG	angiogenin	6.90	1	3.1	42	16.5	9.3
ANKS3	ankyrin repeat and SAM domain-containing protein 3	1.68	1	2.3		72.3	5.3
AIFM1	apoptosis-inducing factor 1, mitochondrial-like	2.45	1	3.0		66.7	9.0
ARAP2	arf-GAP with Rho-GAP domain, ANK repeat and PH domain-containing protein 2, partial	0.47	1	2.7		169.7	7.3
AKNA	AT-hook-containing transcription factor	1.27	1	2.5		137.0	6.0
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
BANF1	barrier-to-autointegration factor	13.48	1	2.7		10.1	6.1
BSG	Basigin	4.02	1	2.6		27.4	5.9
LFNG	beta-1,3-N-acetylglucosaminyltransferase lunatic fringe	3.97	1	3.4	41	41.6	8.7
PNKP	bifunctional polynucleotide phosphatase/kinase	2.68	1	2.6		57.2	8.2
BOLA1	BolA-like protein 1	13.60	1		53	13.0	8.6
BDNF	Brain-derived neurotrophic factor	6.75	1	3.9		26.6	8.5

CNN2	Calponin-2	5.69	1	3.1		32.5	7.0
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
CTSF	cathepsin F	3.25	1	4.4		51.6	7.3
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
CHMP4B	Charged multivesicular body protein 4b	5.26	1	3.1		21.4	4.7
CCDC66	coiled-coil domain-containing protein 66	1.36	1	2.9		110.6	8.1
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
CCBE1	Collagen and calcium-binding EGF domain-containing protein 1	4.29	1	2.6		32.5	6.7
C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
CORO1C	coronin-1C	1.69	1	2.2		53.1	7.1
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	2.89	1	3.1	54	43.1	10.4
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
DLG5	disks large homolog 5	2.56	1	2.3		27.8	6.9
APEX1	DNA-(apurinic or apyrimidinic site) lyase	3.47	1	2.9		35.5	8.4
N/A	DNA-binding protein A-like	10.03	1	9.3	122	39.9	10.1
DNAJB9	dnaJ homolog subfamily B member 9	7.21	1	4.8	42	25.6	8.3
DNAJB3	DnaJ subfamily C member 3	1.99	1	3.4	51	57.5	5.8
RAD18	E3 ubiquitin-protein ligase RAD18	2.43	1	2.3		55.8	8.1
MAN1B1	endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase, partial	3.86	1		49	56.0	6.4
SGCE	Epsilon-sarcoglycan	3.05	1	2.4		37.1	6.7
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
EIF4A2	eukaryotic initiation factor 4A-II isoform 3	4.17	1	4.7	83	36.2	7.4
EIF1B	Eukaryotic translation initiation factor 1b	12.39	1	3.9	81	12.8	7.4
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
XPO1	exportin-1	2.05	1	5.0		122.9	6.1
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
FER1L6	Fer-1 protein 6	2.65	1	2.6		36.3	5.2
FERMT2	Fermitin family-like 2	3.30	1	4.7	71	65.6	6.3
FSIP2	Fibrous sheath-interacting protein 2	0.17	1	2.5		656.4	6.1
FKBP3	FK506-binding protein 3	7.77	1	2.6		10.6	6.8
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
GFAP	Glial fibrillary acidic protein	2.58	1	2.9	65	49.0	5.5
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9

GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4
GSTT2	glutathione S-transferase theta-2-like	5.74	1	3.1		27.8	7.2
Large	glycosyltransferase-like protein LARGE1	2.51	1	2.9		88.0	7.7
NMT2	Glycylpeptide N-tetradecanoyltransferase 2	8.48	1	5.5	72	19.0	5.7
GNG2	guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2-like	10.00	1		41	7.6	7.9
H2-D1	h-2 class I histocompatibility antigen, D-B alpha chain-like, partial	6.67	1	3.2	54	21.4	9.2
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
HEBP1	heme-binding protein 1-like	8.42	1		40	21.2	5.3
HDGF	Hepatoma-derived growth factor	10.05	1	5.3		20.9	4.5
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	4.82	1		42	24.5	9.7
N/A	High mobility group protein 1-like 10	11.90	1		54	14.3	4.6
H2AFX	Histone H2A.x	27.27	2	25.0	120	15.1	10.9
N/A	hypothetical protein I79_016815	8.00	1		54	12.8	11.1
N/A	hypothetical protein I79_017197	15.79	1	2.4		8.4	7.1
N/A	hypothetical protein I79_021924	9.35	1	3.2	40	13.2	4.4
N/A	hypothetical protein LOC100755523	12.50	1	5.6		7.9	7.7
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
IPO4	importin-4	1.02	1	2.2		118.5	5.0
INHBB	inhibin beta B chain	5.35	1	3.8		35.9	7.2
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5
IAH1	isoamyl acetate-hydrolyzing esterase 1 homolog	6.02	1	3.4		27.8	5.7
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
N/A	keratin, type II cytoskeletal 2 oral-like isoform 2	5.03	1	7.0	109	63.0	6.5
KRT5	keratin, type II cytoskeletal 5	1.80	1	2.4		54.4	5.4
KRT8	keratin, type II cytoskeletal 8	4.10	1	6.2	72	54.3	5.8
LTBP3	latent-transforming growth factor beta-binding protein 3	0.81	1	3.2		146.0	6.4
LXN	latexin-like	5.41	1	3.8	83	25.4	6.1
ACP1	low molecular weight phosphotyrosine protein phosphatase	7.69	1	4.0	63	18.0	7.7
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
LOXL1	Lysyl oxidase homolog 1	4.23	1	5.4	76	36.9	6.4
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
MDP1	Magnesium-dependent phosphatase 1	11.50	1	3.4		12.9	6.5
PRNP	Major prion protein	9.16	1	4.1		15.3	6.8
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
MRGPRG	mas-related G-protein coupled receptor member G-like	5.52	1	5.1		32.3	8.6
MMP14	Matrix metalloproteinase-14	1.67	1	2.4		60.7	8.5

MBTPS1	Membrane-bound transcription factor site-1 protease	1.85	1	3.0		65.9	9.0
MANF	Mesencephalic astrocyte-derived neurotrophic factor	7.82	1	3.9		20.4	8.3
WDR77	Methylosome protein 50	5.30	1	9.3		29.8	4.8
N/A	Microtubule-actin cross-linking factor 1, isoform 4	0.10	1	2.6		808.9	5.3
eb1	microtubule-associated protein RP/EB family member 1	7.46	1		43	30.0	5.2
TOMM22	mitochondrial import receptor subunit TOM22 homolog	8.45	1	4.5	76	15.5	4.3
MAPK1	Mitogen-activated protein kinase 1	5.07	2	7.1	41	41.0	7.0
Nlrp9a	NACHT, LRR and PYD domains-containing protein 9A	2.29	1	2.7		59.4	6.1
NPTN	neuroplastin	2.68	1	2.5		42.4	8.2
SLC1A4	Neutral amino acid transporter A	2.54	1	3.0		41.8	5.1
NBR1	Next to BRCA1 gene 1 protein	1.50	1	2.5		95.7	5.6
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NUTF2	nuclear transport factor 2	11.11	1	4.4		14.4	5.4
GTPBP4	nucleolar GTP-binding protein 1	2.05	1	2.7		74.0	9.5
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
NUDCD2	nudC domain-containing protein 2-like	5.73	1	2.3		17.7	5.1
OLA1	Obg ATPase 1	5.17	1	10.4	174	31.9	8.5
PTHLH	Parathyroid hormone-related protein	5.24	1	2.6	42	22.0	10.6
PPID	peptidyl-prolyl cis-trans isomerase D, partial	3.37	1	2.6	50	29.4	6.4
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
PIP5K1A	phosphatidylinositol-4-phosphate 5-kinase protein 1	3.54	1	2.3		45.8	9.8
PMM2	phosphomannomutase 2-like	4.55	1	2.4		27.7	6.7
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1
PAFAH1B2	platelet-activating factor acetylhydrolase IB subunit beta, partial	6.77	1	2.9	63	14.5	6.4
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	3.95	1	2.9	54	25.5	8.6
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
KCNH4	potassium voltage-gated channel subfamily H member 4	1.51	1	2.6		115.7	8.8
PFDN6	prefoldin subunit 6	7.87	1	2.6		14.4	8.9
DDX6	probable ATP-dependent RNA helicase DDX6 isoform 1	4.97	1	6.0	51	54.3	8.7
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
CUTA	Protein CutA	9.79	1	3.5		15.4	5.5
FAM3A	protein FAM3A-like	3.48	1	2.5		25.3	8.4

FNTB	protein farnesyltransferase subunit beta-like, partial	3.44	1	2.3		55.2	6.1
HEG1	protein HEG homolog 1	0.94	1	2.8		113.7	6.2
POMGNT1	protein O-linked-mannose beta-1,2-N-acetylglucosaminyltransferase 1 isoform 2	2.08	1	3.4		71.6	6.6
PPP1R12A	protein phosphatase 1 regulatory subunit 12A	1.23	1	3.5	52	109.5	5.4
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
PRR14L	protein PRR14L-like	0.72	1	2.3		216.3	7.2
SFI1	Protein SFI1-like	3.53	1	2.3		35.0	11.3
SEC31B	Protein transport protein Sec31B	3.17	1	2.6		24.8	6.3
PCMT1	protein-L-isoaspartate(D-aspartate) O-methyltransferase-like	5.95	1	3.0	52	20.1	8.6
TPST1	protein-tyrosine sulfotransferase 1	3.29	1	3.4	47	41.4	9.3
PCDHB5	Protocadherin beta-5	3.04	1	2.3		141.9	4.7
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6
SLC38A10	putative sodium-coupled neutral amino acid transporter 10 isoform 1	1.01	1	2.7		117.8	5.5
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3
IQGAP2	Ras GTPase-activating-like protein IQGAP2	0.58	1	2.3		177.8	5.6
RAC3	ras-related C3 botulinum toxin substrate 3	6.76	1	3.6		16.7	8.6
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
RAB39A	Ras-related protein Rab-39A	12.64	1	3.2	48	10.2	9.5
N/A	rCG40478, isoform CRA_b	13.68	1	3.1		12.6	9.3
FTH1	Ferritin heavy chain	20.97	3	14.2	197	21.5	6.2
RPA1	Replication protein A 70 kDa DNA-binding subunit	3.39	2	6.1	47	68.5	7.9
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9
FBLL1	rRNA/tRNA 2'-O-methyltransferase fibrillarin-like protein 1	14.29	1	3.9		10.8	6.8
RUVBL2	RuvB 2	2.38	1	2.2		51.1	5.6
STK38	Serine/threonine-protein kinase 38	7.69	1	2.2		15.0	5.4
PKN1	serine/threonine-protein kinase N1	1.02	1	5.4		109.0	6.6
PPP2R2A	serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	2.41	1	3.9	56	52.9	6.5
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	3.28	1	2.8	49	46.0	7.6
PPP1CB	serine/threonine-protein phosphatase PP1-beta catalytic subunit-like	3.04	1	3.1	41	37.3	7.5
SMAP	small acidic protein-like	9.34	1	4.6	44	20.1	4.8
SNRPE	small nuclear ribonucleoprotein E	11.96	1	2.6	60	10.8	8.7
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9
SPIN4	spindlin-4-like	4.02	1	2.4		28.5	8.1
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7

STX12	Syntaxin-12	3.28	1	2.6		31.2	5.3
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TES	testin-like isoform 1	2.96	1		51	46.1	7.5
TXNDC12	Thioredoxin domain-containing protein 12	8.82	1	5.0		19.0	5.8
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
TXNL1	Thioredoxin-like protein 1	5.82	1	2.9		20.8	4.9
ALYREF	THO complex subunit 4	7.01	1	3.4		16.8	10.1
THBD	Thrombomodulin	4.27	1	4.1		35.4	4.7
THUMPD1	THUMP domain-containing protein 1	3.90	1	2.6		40.3	6.5
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
TFAP4	transcription factor AP-4-like	3.25	1	2.4		38.7	6.1
PURB	Transcriptional activator protein Pur-beta	10.47	1	2.5		9.6	5.0
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TGFB1	transforming growth factor beta-1, partial	7.35	1	5.3	45	31.2	8.2
TGFB2	Transforming growth factor beta-2	1.55	1	2.3		44.6	8.6
TRAIP	TRIP protein	1.69	1	2.9	50	77.1	4.8
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
TUBA4A	tubulin alpha-4A chain	6.24	1	7.5	84	48.3	5.0
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFRSF12A	tumor necrosis factor receptor superfamily member 12A isoform 1	22.58	1	6.1		13.0	7.6
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
TWSG1	Twisted gastrulation protein homolog 1	6.76	1	3.7	57	24.7	5.5
N/A	ubc2e ubiquitin conjugating enzyme, isoform CRA_b	10.00	1	2.9		12.6	8.3
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
C11orf68	UPF0696 protein C11orf68 homolog	4.38	1	2.7		27.5	5.5
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9
ZNF829	zinc finger protein 829	1.48	1	3.6	77	70.3	8.5

Table 3.3.42: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
PSMC1	26S protease regulatory subunit 4	2.73	1	5.9	88	49.2	6.2
PSMC2	26S protease regulatory subunit 7	5.17	2	6.7	45	52.0	5.8
PPID	40 kDa peptidyl-prolyl cis-trans isomerase	4.09	1	2.2		24.0	6.0
RPS13	40S ribosomal protein S13	5.30	1		49	15.2	10.3
RPS23	40S ribosomal protein S23	7.75	1	3.2	56	15.9	9.9
RPL14	60S ribosomal protein L14	4.49	1	3.1	61	29.5	11.0
RPL17	60S ribosomal protein L17	5.05	1	2.6	46	23.0	10.2
RPL27A	60S ribosomal protein L27a	7.63	1	2.4		14.6	9.9
RPL35	60S ribosomal protein L35	8.20	1	2.8		14.4	10.7
RPL4	60S ribosomal protein L4	2.84	1	2.8	49	47.5	11.0
RPL7	60S ribosomal protein L7	12.94	1	3.5	64	10.0	10.0
PFKL	6-phosphofructokinase, liver type	1.15	1	2.5		85.3	7.5
ADAMTS4	A disintegrin and metalloproteinase with thrombospondin motifs 4	2.93	1		42	95.6	8.2
ACTA1	actin, alpha skeletal muscle A	12.64	1	50.9	243	9.7	8.5
ACTG1	Actin, cytoplasmic 2	45.48	15	82.0	755	41.8	5.5
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
ACTR3B	Actin-related protein 3B	3.03	1	2.7	49	41.7	6.6
ADK	Adenosine kinase	3.32	1	3.5		40.2	6.6
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
App	Alzheimer's amyloid beta protein precursor	17.72	1	12.4	529	8.5	7.4
AIMP1	Aminoacyl tRNA synthase complex-interacting multifunctional protein 1	5.61	1	4.6	54	35.2	8.8
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
APOA1	Apolipoprotein A-I-binding protein	5.22	1	2.8		25.4	5.4
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
RARS	Arginyl-tRNA synthetase, cytoplasmic	1.66	1	3.5	43	75.5	7.1
ATXN10	Ataxin-10	3.16	1	2.8	69	53.8	5.2
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
ACTR1B	beta-centractin	2.66	1	3.2		42.2	6.7
BAZ2B	Bromodomain adjacent to zinc finger domain protein 2B	0.54	1	2.3		205.6	6.1

CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
CPD	Carboxypeptidase D	0.90	1	2.8	59	123.4	6.2
CRTAP	Cartilage-associated protein	3.07	1	2.8		30.8	4.9
CSNK2A1	Casein kinase II subunit alpha	3.84	1	3.8		45.1	7.7
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
P21926	CD9 antigen	6.29	1	3.1		17.7	6.7
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
CHD6	Chromodomain-helicase-DNA-binding protein 6	1.72	1	2.3		74.8	5.7
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
COL16A1	collagen alpha-1(XVI) chain	1.13	1	4.7	65	156.3	7.7
CTGF	Connective tissue growth factor	4.60	1	4.3		38.1	7.9
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
SPRR1A	cornifin-A	28.32	1	2.2		12.4	7.9
Q9UEE9	Craniofacial development protein 1	3.38	1	3.0	43	33.0	4.8
ATF4	Cyclic AMP-dependent transcription factor ATF-4	2.30	1	2.3		38.2	4.9
CRIM1	Cysteine-rich motor neuron 1 protein	3.49	1	2.9		37.6	4.9
CRELD1	cysteine-rich with EGF domain protein 1	2.86	1	2.2		45.7	5.1
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
CTBS	Di-N-acetylchitobiase	5.15	1	2.5	57	32.9	5.7
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	110	102.1	5.6
MCM3	DNA replication licensing factor MCM3	2.11	1	3.8		90.7	5.5
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4
DBN1	Drebrin	2.83	1		55	69.5	4.4
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0
EFEMP1	EGF-containing fibulin extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
ELAVL1	ELAV protein 1	3.88	1	3.5	72	37.1	9.2
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
MAN1B1	Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase	3.86	1	3.0		29.7	6.5
EDF1	Endothelial differentiation-related factor 1	14.15	1	12.1	70	11.7	10.0
env	Envelope glycoprotein	2.28	1	4.2	42	73.5	7.7

ETF1	eukaryotic peptide chain release factor subunit 1	3.22	1	3.4	54	45.4	5.5
EIF2S2	Eukaryotic translation initiation factor 2 subunit 2	3.00	1	2.4		38.2	5.8
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
SSRP1	FACT complex subunit SSRP1 isoform 1	1.55	1	2.5		81.0	6.9
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FNDC8	fibronectin type III domain-containing protein 8	3.11	1	4.6		35.9	6.3
FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
gag	Gag polyprotein	6.13	1	2.9		19.6	8.7
TSTA3	GDP-L-fucose synthase	3.74	1	3.6	51	35.8	6.9
GSN	gelsolin	1.98	1	3.8		72.0	6.3
N/A	glutamate	1.11	1	2.4		137.1	8.6
N/A	Glutaminyl-tRNA synthetase	1.29	1	2.4	49	87.7	7.2
GPX1	Glutathione peroxidase 1	8.96	1		45	22.3	7.2
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4
GAPDH	glyceraldehyde-3-phosphate dehydrogenase, partial	32.70	1	7.5	224	33.8	8.5
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
GLIPR2	Golgi-associated plant pathogenesis-related protein 1	8.67	1	3.4	58	16.7	9.2
PLA2G15	group XV phospholipase A2	2.75	1	2.3		33.7	6.5
GNAL	Guanine nucleotide-binding protein G(olf) subunit alpha	6.75	1	3.1	60	18.6	7.9
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
HNRNPM	Heterogeneous nuclear ribonucleoprotein M	3.33	1		43	73.7	8.7
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
H2AFZ	Histone H2A.Z	16.50	1	7.6		11.1	10.3
Hist3h2ba	histone H2B type 3-A	11.90	1	15.2	304	14.0	10.4
HMGCS2	hydroxymethylglutaryl-CoA synthase, mitochondrial	2.17	1	3.4	54	57.2	8.6
N/A	hypothetical protein I79_011206	3.13	1	3.9	45	69.3	6.3
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8
ITPR3	Inositol 1,4,5-trisphosphate receptor type 3	1.67	1	2.3		95.6	6.1
ITM2B	integral membrane protein 2B	4.89	1		46	30.3	5.1
ICAM1	intercellular adhesion molecule 1 precursor	2.66	1	3.5		57.6	7.2
KDELC2	KDEL motif-containing protein 2	1.99	1		41	52.4	7.5

KRT6A	Keratin, type II cytoskeletal 6A	9.19	1	17.1	181	48.5	8.0
KGFLP1	keratinocyte growth factor	4.64	1	2.3		22.4	9.1
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2
LAMA3	laminin subunit alpha-3	0.34	1	3.7	50	350.8	6.8
LTA4H	leukotriene A-4 hydrolase	2.13	1	3.1	48	69.1	6.3
N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
LPCAT1	Lysophosphatidylcholine acyltransferase 1	3.65	1	2.2		21.7	10.3
PPT2	lysosomal thioesterase PPT2	5.96	1	4.4	47	34.3	6.5
MVP	Major vault protein	4.28	1	3.8		40.9	6.0
MSLN	mesothelin	1.92	1	5.7	49	69.8	6.4
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	3.98	1	3.3	42	38.3	5.9
GALNS	N-acetylgalactosamine-6-sulfatase	2.07	1	3.3	54	54.0	6.9
GALNT7	N-acetylgalactosaminyltransferase 7	2.14	1	4.0	70	69.7	7.5
PGLYRP2	N-acetylmuramoyl-L-alanine amidase	2.02	1	2.9	42	64.8	6.9
UBE2M	NEDD8-conjugating enzyme Ubc12	5.42	1	2.8		22.9	4.7
NENF	neudesin	11.29	2	2.7	45	20.4	7.8
ULBP1	NKG2D ligand 1	4.73	1	2.5		19.3	8.4
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	4.53	1	2.3		27.1	5.1
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
OR10X1	olfactory receptor 10X1	3.23	1	8.2		34.4	8.6
OSMR	oncostatin-M-specific receptor subunit beta	1.34	1		40	110.4	6.2
Q86UD1	Out at first protein	21.71	3	7.6		17.7	8.1
PALLD	Palladin	3.17	1	2.3		42.1	8.6
PAPLN	Papilin	2.89	2		79	127.2	7.3
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
FKBP2	peptidyl-prolyl cis-trans isomerase FKBP2 isoform 1	8.57	1	2.2		15.4	9.3
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
PFAS	phosphoribosylformylglycinamidine synthase	0.82	1	3.0	67	144.6	5.6

PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
PABPN1	Polyadenylate-binding protein 2	5.21	1	2.9	43	23.8	9.8
PABPC4	Polyadenylate-binding protein 4	5.34	1	7.5	87	57.9	9.2
PTRF	polymerase I and transcript release factor	4.60	1	4.7	53	43.7	5.5
PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
PFDN4	Prefoldin subunit 4	11.19	1	3.6	62	15.3	4.6
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
PDCD5	programmed cell death protein 5	8.46	1	2.4	43	14.9	6.9
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
PSME3	Proteasome activator complex subunit 3	10.28	1	7.3	107	12.0	8.3
CDV3	protein CDV3 homolog	8.24	1	5.0	41	31.3	7.2
DBF4	Protein DBF4 A	4.19	1	4.0		40.4	5.7
TTLL8	protein monoglycylase TTLL8	1.08	1	2.4		95.4	8.5
PPP1R7	Protein phosphatase 1 regulatory subunit 7	3.05	1	3.4	60	41.6	4.9
PPM1F	Protein phosphatase 1F	11.36	1	4.6	47	19.4	4.9
RCC2	Protein RCC2	3.77	1	3.6	49	31.9	7.0
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
N/A	putative allantoicase	1.10	1	2.3	47	80.2	7.9
MEFV	Pyrin	1.46	1	2.3		76.3	7.1
RSU1	ras suppressor protein 1	3.25	1	2.2		31.5	8.6
Ptprs	Receptor-type tyrosine-protein phosphatase S	1.75	1	2.6		56.0	5.1
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7
RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
RBM39	RNA-binding protein 39 isoform a	2.83	1	2.5	45	59.3	10.1
RUVBL1	ruvB 1	2.63	1	3.3		50.2	6.4
SALL1	Sal protein 1	0.77	1	2.2		137.3	7.0
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9

SRSF5	serine/arginine-rich splicing factor 5	3.35	1	2.8	45	30.9	11.6
PPP2R1A	serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A beta isoform isoform 1	2.00	1	2.9		65.9	5.1
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
NANS	sialic acid synthase	2.79	1		56	40.2	6.9
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9
SNX1	sorting nexin-1 isoform 2	3.06	1	8.1	77	51.7	5.7
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
SPTBN4	spectrin beta chain, brain 4	0.28	1	2.3		403.9	6.3
N/A	Sperm motility kinase X	5.08	1		41	22.1	6.7
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
SRSF7	Splicing factor, arginine/serine-rich 7	5.29	1	11.6	117	26.1	11.9
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
O60687	Sushi repeat-containing protein SRPX2	4.24	1	3.2		32.2	7.8
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TTC25	tetratricopeptide repeat protein 25	1.09	1	2.5	43	73.3	5.6
TGFBR2	TGF-beta receptor type-2 isoform 1	2.65	1	12.3		64.3	6.0
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9
TRA2B	transformer-2 protein homolog beta isoform 1	5.56	1	2.9	75	33.6	11.3
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
TSKU	tsukushin	3.95	1	4.0		38.1	6.6
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7
TWF1	Twinfilin-1	2.57	1	2.9	42	40.0	6.5
ZRSR1	U2 small nuclear ribonucleoprotein auxiliary factor 35 kDa subunit-related protein 1	2.34	1	2.3		51.0	9.1
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8
UCHL5	Ubiquitin carboxyl-terminal hydrolase isozyme L5	3.50	1	2.9		35.9	5.1
UFD1L	Ubiquitin fusion degradation protein 1 homolog	4.23	1	2.3		34.5	6.7

Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3
UBAP2	Ubiquitin-associated protein 2	4.36	1	3.9	55	49.3	8.7
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2	13.10	2	5.5	57	15.4	4.9
UBXN1	UBX domain-containing protein 1, partial	10.08	1	2.3		13.0	5.5
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
N/A	uncharacterized protein C12orf29 homolog	4.31	1	2.3		37.3	7.3
N/A	Uncharacterized protein KIAA0319	2.11	1		62	104.3	6.1
N/A	uncharacterized protein KIAA0586, partial	0.75	1	2.2		161.7	6.1
PLAUR	Urokinase plasminogen activator surface receptor	5.38	1	2.3	43	20.3	5.1
NSF	Vesicle-fusing ATPase	26.00	1	3.5	46	5.5	6.6
NSF	vesicle-fusing ATPase, partial	14.29	1	2.6		8.6	5.4
LMAN2	vesicular integral-membrane protein VIP36	5.62	2	6.1	53	40.2	6.9
XPNPEP1	xaa-Pro aminopeptidase 1	1.77	1	2.7		69.8	5.5
ZEB2	zinc finger E-box-binding homeobox 2	0.91	1	2.5		135.4	6.1
EIF3C	eukaryotic translation initiation factor 3 subunit C, partial	3.44	2	7.1		84.0	5.5
ALDH1A1	Retinal dehydrogenase 1	7.43	2	6.2	57	29.0	7.0
SPTBN1	spectrin beta chain, brain 1 isoform 2	0.74	2	4.7		250.9	5.6
TLN1	Talin-1	1.68	3	8.0	82	199.0	5.3
N/A	Tubulin beta-6 chain	9.30	2	86.1	878	24.6	4.9
PAM	peptidyl-glycine alpha-amidating monooxygenase-like isoform 4	7.83	4	4.5	152	96.7	6.6
LMNA	prelamin-A/C-like isoform 2	27.64	15	61.0	543	73.7	8.0
RPL18A	60S ribosomal protein L18a	5.68	1	2.2		20.3	10.6
Aldh1a7	Aldehyde dehydrogenase, cytosolic 1	2.17	1	2.4		45.4	6.6
COPB1	Coatomer subunit beta'	1.14	1	2.3		89.4	5.5
ACOT7	Cytosolic acyl coenzyme A thioester hydrolase	3.43	1	2.4		35.6	7.5
FBXW7	F-box/WD repeat-containing protein 7 isoform 1	2.07	1	2.5		70.5	8.4
HDAC2	Histone deacetylase 2	2.62	1	3.3	50	51.9	5.7
KPNA2	importin subunit alpha-2	3.40	1	3.7	56	57.8	5.3
NAA15	N-alpha-acetyltransferase 15, NatA auxiliary subunit	1.10	1	2.3		95.3	7.0
NOLC1	Nucleolar phosphoprotein p130	2.15	1	2.8		73.4	9.5
SIL1	Nucleotide exchange factor SIL1	2.32	1	2.3		44.0	4.9
PLOD2	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 2	2.39	1	3.2		67.1	7.5
PCMTD2	protein-L-isoaspartate O-methyltransferase domain-containing protein 2	3.62	1	4.5		40.8	6.7
PM20D1	putative carboxypeptidase PM20D1	2.62	1	2.5		55.0	6.9
RRS1	ribosome biogenesis regulatory protein homolog, partial	4.46	1	2.8		22.4	11.3
SEPP1	Selenoprotein P	5.82	1	3.1	40	21.8	9.1
PPP2R2A	Serine/threonine-protein phosphatase 2A regulatory subunit B'	7.22	1	2.3		20.4	6.5

SUMF1	Sulfatase-modifying factor 1	5.28	1	3.4	50	31.7	6.3
TNPO1	Transportin-1	1.73	1	2.8	50	79.2	5.1
VWA5A	von Willebrand factor A domain-containing protein 5A	1.89	1	2.3		58.9	4.7
ATP6V1B2	V-type proton ATPase subunit B, brain isoform	2.24	1	2.6		49.8	5.3
ALDH16A1	aldehyde dehydrogenase family 16 member A1 isoform 2	1.60	1	3.1	51	79.9	7.1
CLTB	Clathrin light chain B	6.62	1	2.3		17.4	5.5
COPA	coatomer subunit alpha isoform 1	0.82	1	2.8		138.2	7.6
DENR	Density-regulated protein	5.26	1	2.4		17.2	6.8
EIF3K	Eukaryotic translation initiation factor 3 subunit K	6.32	1	2.9		19.9	4.8
EIF4E	Eukaryotic translation initiation factor 4E	9.40	1	2.6	64	13.4	8.3
FST	Follistatin	4.11	1	3.8	57	34.8	5.8
GMFB	Glia maturation factor beta	8.26	1	2.6		12.7	9.4
KDM5A	Lysine-specific demethylase 5A	0.62	1	2.4		182.6	6.4
TIM13	Mitochondrial import inner membrane translocase subunit Tim13	19.18	1	3.7	84	8.5	9.1
TIMM8A	Mitochondrial import inner membrane translocase subunit Tim8 A	22.00	1	3.2	43	5.7	5.2
NPLOC4	nuclear protein localization protein 4 homolog	1.45	1	3.1		76.5	7.0
PPIH	Peptidyl-prolyl cis-trans isomerase H	6.72	1	2.4		14.6	8.4
PRPF8	Pre-mRNA-processing-splicing factor 8	2.65	1	2.7	51	30.1	7.2
CWC25	pre-mRNA-splicing factor CWC25 homolog	1.67	1	2.3		49.1	10.1
ROGDI	protein rogdi homolog	3.78	1	2.2		32.8	8.3
TFG	Protein TFG	13.89	1	2.9		8.4	7.3
PDE6G	retinal rod rhodopsin-sensitive cGMP 3',5'-cyclic phosphodiesterase subunit gamma	12.64	1	2.3		9.7	9.5
SMARCC2	SWI/SNF complex subunit SMARCC2	0.89	1	2.3		121.9	5.4
SWAP70	switch-associated protein 70	1.71	1	3.3	44	68.7	6.2
SNRPB2	U2 small nuclear ribonucleoprotein B"	6.11	1	3.2		20.1	9.7
PSMD3	26S proteasome non-ATPase regulatory subunit 3-like, partial	8.62	1	3.4	57	20.0	9.6
Rps8	40S ribosomal protein S8-like, partial	6.75	1	12.7	40	19.1	10.8
ACTG2	actin, gamma-enteric smooth muscle-like isoform 2	24.80	1	42.5	495	41.7	6.0
ARPC5	actin-related protein 2/3 complex subunit 5-like	11.88	1	3.7	84	10.8	9.8
UPB1	beta-ureidopropionase-like	4.58	1	3.9		44.3	7.1
PRKACA	cAMP-dependent protein kinase catalytic subunit alpha-like isoform 1	2.65	1	2.4		39.4	8.8
CCDC58	coiled-coil domain-containing protein 58-like	7.64	1	2.6	49	16.6	7.3
ATOX1	copper transport protein ATOX1-like	19.12	1	3.8	61	7.4	7.2
Cul5	cullin-5-like isoform 2	1.28	1	2.3		90.9	7.9
CKAP5	cytoskeleton-associated protein 5-like	0.59	1	5.5	54	225.4	7.8
QDPR	dihydropteridine reductase-like	6.64	1		47	25.6	7.8
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2 precursor	13.54	1	15.7	75	49.4	4.9

EEF1D	elongator complex protein 2-like isoform 3	1.70	1	3.3		85.4	5.9
RAN	GTP-binding nuclear protein Ran-like, partial	24.83	1	14.7	159	17.0	6.3
HNRPDL	heterogeneous nuclear ribonucleoprotein D-like	9.59	1	9.1	110	30.2	8.7
HIST1H1D	histone H1.3-like	6.28	1		76	20.5	11.0
CUX1	homeobox protein cut-like 1	0.41	1	2.3		186.7	6.4
IL11	interleukin-11-like	4.04	1	2.5		21.3	8.1
KRT24	keratin, type I cytoskeletal 24-like isoform 2	3.18	1	2.2		22.0	8.2
LPHN2	latrophilin-2-like	0.87	1	3.3	46	166.7	6.6
SON	protein SON-like	0.41	1	2.4		263.6	5.6
SNRNP40	U5 small nuclear ribonucleoprotein 40 kDa protein-like	7.13	1	3.8	41	48.3	8.9
VCAM1	vascular cell adhesion protein 1-like, partial	2.61	1	2.9		42.5	4.8
TCIRG1	V-type proton ATPase 116 kDa subunit a isoform 3-like	1.56	1	2.2		93.3	6.7
N/A	WD repeat-containing protein 61-like isoform 1	3.93	1	2.6		33.6	5.6

Table 3.3.43: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
HSPE1	10 kDa heat shock protein, mitochondrial-like	23.53	2	5.4	81	11.0	9.5
EIF3G	eukaryotic translation initiation factor 3 subunit G-like	7.19	2	6.8	80	35.7	5.9
KRT5	keratin, type II cytoskeletal 5-like	8.40	4	23.0	101	54.4	5.4
NHP2L1	NHP2-like protein 1-like	17.42	2	5.4	62	14.6	8.1
PSMA6	proteasome subunit alpha type-6-like, partial	11.36	2	3.7	113	24.4	6.6
PSMB8	Proteasome subunit beta type-8	10.96	2	7.8	65	25.5	7.1
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
ADM	ADM	22.28	2	9.8	82	20.6	10.2
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4
C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0

EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1

PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1

PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9
PRPS1	ribose-phosphate pyrophosphokinase 1-like	6.60	2	5.8	53	34.7	6.8
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3
FTH1	Ferritin heavy chain	20.97	3	14.2	197	21.5	6.2
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8

VASN	vasorin	13.52	5	32.6	275	72.5	7.5
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8

Table 3.3.44: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6
SORD	sorbitol dehydrogenase	6.44	2	2.4	47	38.3	7.7
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9
NENF	neudesin	11.29	2	2.7	45	20.4	7.8
BTF3	transcription factor BTF3	17.90	2	2.7	65	17.7	6.9
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8
ISYNA1	Inositol-3-phosphate synthase 1	8.37	2	3.1	81	46.9	5.7
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.18	2	4.6		54.4	6.4
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3
PSPH	phosphoserine phosphatase	7.56	2	4.8	46	25.0	5.5
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
PLAT	tissue-type plasminogen activator	4.29	2	5.4	73	63.0	8.2
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2
NASP	nuclear autoantigenic sperm protein	2.47	2	5.5	56	83.4	4.4
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
CNPY2	Protein canopy 2	26.80	2	5.6	48	11.0	4.8

PFDN2	prefoldin subunit 2	16.88	2	5.6	82	16.7	6.6
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	2	5.7	76	28.5	4.1
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4
VPS35	vacuolar protein sorting-associated protein 35	3.11	2	5.8	41	96.0	5.5
GARS	glycyl-tRNA synthetase	3.10	2	5.9	53	79.8	6.8
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4
SEPT11	septin-11	4.47	2	5.9	53	49.0	7.0
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
LMAN2	vesicular integral-membrane protein VIP36	5.62	2	6.1	53	40.2	6.9
SEPT9	septin-9	3.71	2	6.1	42	63.7	8.3
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
RPL13	60S ribosomal protein L13	11.34	2	6.2	73	22.4	11.8
HPSE	heparanase	4.83	2	6.3		60.9	9.0
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	2.26	2	6.3	78	109.4	5.0
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
PGM1	Phosphoglucomutase-1	4.90	2	6.6	105	62.8	5.9
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
PSMB5	proteasome subunit beta type-5	8.75	2	6.6	77	28.7	7.0
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
N/A	Lamin-L(I)	4.76	2	6.9	72	54.9	4.9
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9

PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
ECM1	extracellular matrix protein 1	4.09	2	7.0	70	63.2	6.8
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
RPL27	60S ribosomal protein L27	15.45	2	7.1	45	12.1	10.1
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	1.82	2	7.1	52	158.1	6.0
EIF3I	eukaryotic translation initiation factor 3 subunit I	8.62	2	7.2	55	36.3	5.6
CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8
DDB1	DNA damage-binding protein 1	2.54	3	7.4		126.8	5.3
AHSA1	Activator of 90 kDa heat shock protein ATPase homolog 1	8.88	3	7.4	45	38.1	5.5
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
NRP1	neuropilin-1	3.90	2	7.6	98	103.0	5.9
MAN2B2	Epididymis-specific alpha-mannosidase	2.99	2	7.6	69	111.3	7.5
Q86UD1	Out at first protein	21.71	3	7.6		17.7	8.1
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	29.63	3	7.8	118	11.9	8.7
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
PROSC	Proline synthetase co-transcribed bacterial protein	11.21	2	8.3	56	24.8	6.4
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
HMGB2	High mobility group protein B2	20.13	3	9.0		18.2	5.4
D1Pas1	putative ATP-dependent RNA helicase Pl10	6.49	2	9.1	103	58.1	7.1
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	6.49	3	9.2		63.0	5.1
POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9

TTLL12	tubulin--tyrosine ligase protein 12	5.31	3	10.1	58	74.1	5.6
PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	6.03	2	10.4	43	55.9	7.3
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
TPM2	tropomyosin beta chain, partial	13.95	2	10.6	84	29.9	4.6
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	110	102.1	5.6
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
TUBA1A	Tubulin alpha-1A chain	19.29	6	21.6	250	50.1	5.1
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
GPR56	G-protein coupled receptor 56	3.20	2	32.4	290	77.3	8.8
FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
AP1B1	AP-1 complex subunit beta-1	2.23	2	2.3	43	103.9	5.2
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1
EFEMP1	EGF-containing fibulin extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
PAICS	Multifunctional protein ADE2	5.41	2	5.5	55	47.1	7.2
ALDH1A1	Retinal dehydrogenase 1	7.43	2	6.2	57	29.0	7.0
PSMB2	Proteasome subunit beta type-2	8.96	2	5.5	63	22.8	7.9
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
ARPC4	Actin-related protein 2/3 complex subunit 4	13.17	2	6.1	74	19.5	8.4
TLN1	Talin-1	1.68	3	8.0	82	199.0	5.3

COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
PAM	peptidyl-glycine alpha-amidating monooxygenase-like isoform 4	7.83	4	4.5	152	96.7	6.6
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
LMNA	prelamin-A/C-like isoform 2	27.64	15	61.0	543	73.7	8.0
N/A	Tubulin beta-6 chain	9.30	2	86.1	878	24.6	4.9
EIF3C	eukaryotic translation initiation factor 3 subunit C, partial	3.44	2	7.1		84.0	5.5
PAPLN	Papilin	2.89	2		79	127.2	7.3
PRMT5	Protein arginine N-methyltransferase 5	3.14	2	5.9		72.7	6.2
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	31.18	2		77	10.4	4.8
SPTBN1	spectrin beta chain, brain 1 isoform 2	0.74	2	4.7		250.9	5.6

Table 3.3.45: HCPs from the cell culture supernatant of a non-producing CHO K1 and an IgG secreting DP12 cell line identified with one or more peptides as being common to both cell lines at 37˚C. Proteins identified with two or more peptides as being common to both cell lines are also indicated.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
YWHAB	14-3-3 protein beta/alpha isoform 2	22.54	3	21.7	241	27.8	4.8	x
YWHAE	14-3-3 protein epsilon, partial	33.33	4	16.5	80	11.9	5.8	x
YWHAH	14-3-3 protein eta	17.89	2	17.9	86	28.2	4.9	x
YWHAQ	14-3-3 protein theta	21.63	2	19.3	123	27.7	4.8	x
YWHAZ	14-3-3 protein zeta/delta	17.55	2	11.8	122	27.7	4.8	x
PSMD4	26S proteasome non-ATPase regulatory subunit 4	2.65	1	3.6	63	40.7	4.8	
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7	
RPS11	40S ribosomal protein S11	12.03	2	6.0	40	18.3	10.0	x
RPS12	40S ribosomal protein S12	21.97	2	12.1		14.5	6.7	x
RPS15A	40S ribosomal protein S15a	17.69	2	8.3	66	14.8	10.1	x
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2	
RPS18	40S ribosomal protein S18	28.68	4	12.6	67	15.7	10.4	x
RPS19	40S ribosomal protein S19-like, partial	7.35	1	2.3	45	15.1	10.5	
RPS2	40S ribosomal protein S2	12.90	2	5.5	40	20.4	9.5	x
RPS20	40S ribosomal protein S20	15.00	2	5.6	48	13.4	9.9	x
RPS21	40S ribosomal protein S21-like	22.89	2	6.7	51	9.1	8.3	x
RPS25	40S ribosomal protein S25	15.13	2	6.2	56	13.5	10.9	x
RPS26	40S ribosomal protein S26	10.47	1	2.3	41	9.7	9.9	
RPS27	40S ribosomal protein S27	22.41	1	3.7	69	6.8	8.0	
RPS3	40S ribosomal protein S3	11.93	2	7.3	66	26.7	9.7	x
RPS3A	40S ribosomal protein S3a	7.58	2	8.8	58	29.9	9.7	
RPS4X	40S ribosomal protein S4, X isoform	7.25	2	6.1	41	29.2	10.3	x
RPS6	40S ribosomal protein S6	31.34	2	6.2		7.6	5.0	x
RPS8	40S ribosomal protein S8	13.46	2	7.3	47	24.2	10.3	x
RPS9	40S ribosomal protein S9	14.62	2	4.8	56	14.8	10.8	x
RPSA	40S ribosomal protein SA	13.41	2	7.2	61	19.7	9.3	x
SDF4	45 kDa calcium-binding protein	22.82	6	27.6	225	41.2	4.9	x
RPLP0	60S acidic ribosomal protein P0	7.72	2	6.1	43	29.9	8.5	x
RPLP2	60S acidic ribosomal protein P2	25.22	2	8.9	120	11.7	4.5	x
RPL11	60S ribosomal protein L11	13.17	2	6.2	66	19.0	9.8	x

RPL12	60S ribosomal protein L12	49.25	3	16.9	121	14.7	9.6	x
RPL15	60S ribosomal protein L15, partial	10.61	2	7.2	75	23.5	11.6	x
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8	
RPL23	60S ribosomal protein L23	25.00	2	9.9	89	14.9	10.5	
RPL23A	60S ribosomal protein L23a	32.84	2	3.3	72	7.6	8.4	x
RPL29	60S ribosomal protein L29	9.65	1	6.0	56	12.4	11.5	
RPL3	60S ribosomal protein L3	7.44	2	7.5	71	46.1	10.2	x
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3	
RPL5	60S ribosomal protein L5	9.46	2	6.9		34.2	9.8	x
Rpl6	60S ribosomal protein L6	14.53	2	4.9	41	13.6	9.9	x
RPL7A	60S ribosomal protein L7a	14.20	2	6.5		19.7	9.7	x
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9	
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4.55	2	5.6	45	53.3	6.6	x
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	0.68	1	3.5	56	177.6	5.8	
ACAT2	acetyl-CoA acetyltransferase, cytosolic	10.08	2	6.9	100	41.0	7.3	x
ASAH1	Acid ceramidase	11.14	3	11.8	71	44.6	7.9	x
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	1	6.9	63	28.5	4.1	
ACTA1	actin, alpha skeletal muscle	24.93	1	34.3	212	42.0	5.4	
ACTB	actin, cytoplasmic 1	45.33	5	60.7	531	41.7	5.4	x
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	8.0	91	14.4	9.6	x
DBI	acyl-CoA-binding protein	32.18	2	5.7	42	10.0	8.8	x
CRKL	adapter molecule crk	8.56	2	11.9	130	36.1	5.7	x
APRT	adenine phosphoribosyltransferase	16.67	2	9.2		19.4	6.0	x
AHCY	adenosylhomocysteinase	4.40	2	5.9	59	47.6	6.5	x
AK2	Adenylate kinase 2, mitochondrial	21.13	2	12.7	49	15.4	7.9	x
ADSL	Adenylosuccinate lyase	4.55	2	4.5		54.9	6.9	x
CAP1	adenylyl cyclase-associated protein 1 isoform 1	6.33	2	7.6	64	51.5	7.3	x
AGRN	agrin isoform 1	1.33	2	8.3	97	217.0	5.8	x
AARS	Alanyl-tRNA synthetase, cytoplasmic	2.73	2	7.3		104.8	5.6	x
AKR1A1	alcohol dehydrogenase	13.27	3	12.6	89	36.5	7.1	x
ADH5	alcohol dehydrogenase class-3	6.68	2	6.5		39.6	7.7	x
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1	
AKR1B1	aldose reductase	8.54	2	8.0	43	35.8	7.4	x
ACTN1	Alpha-actinin-1	7.31	2	17.7	239	102.7	5.5	x
ACTN4	Alpha-actinin-4	13.56	2	12.4	154	33.7	4.9	x
ENO1	alpha-enolase	21.21	7	32.4	246	46.7	6.2	x
GLA	Alpha-galactosidase A	13.49	3	11.6	86	38.5	5.0	x

IDUA	alpha-L-iduronidase	4.06	2	2.7	44	72.1	6.8	x
MAN2A1	Alpha-mannosidase 2	4.13	2	8.3	92	78.3	8.0	x
NAGA	alpha-N-acetylgalactosaminidase	22.89	5	29.0	261	47.2	7.8	x
NAGLU	alpha-N-acetylglucosaminidase-like	1.76	1	2.7	42	83.4	6.7	
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6	
APP	Amyloid beta A4 protein	24.10	14	75.5	620	84.7	4.8	x
APLP2	Amyloid protein 2	13.48	7	22.5	57	84.8	4.8	x
ANXA1	Annexin A1	13.29	3	13.3	79	38.8	7.0	x
ANXA2	annexin A2, partial	11.89	2	8.4	84	25.4	6.0	x
ANXA5	annexin A5	7.79	2	7.2	69	36.0	5.0	x
ARSA	arylsulfatase A	8.88	2	8.1	94	55.0	5.1	x
GOT1	aspartate aminotransferase, cytoplasmic	6.05	2	7.2	68	46.2	7.2	x
DHX9	ATP-dependent RNA helicase A	1.34	1	2.9		133.1	6.6	
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	23.66	24	450.9	3732	471.6	6.5	x
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8	
B2M	beta-2-microglobulin precursor	27.73	3	53.8	328	13.8	7.4	x
GLB1	Beta-galactosidase	3.38	2	6.0	46	73.6	6.9	x
GUSB	Beta-glucuronidase	8.64	2	8.2		27.9	7.9	x
HEXA	beta-hexosaminidase subunit alpha	5.87	2	7.9	73	60.6	6.5	x
HEXB	Beta-hexosaminidase subunit beta	4.22	2	5.2	44	49.0	6.6	x
BTD	biotinidase	5.03	2	7.0	81	60.1	6.1	x
BMP1	bone morphogenetic protein 1	11.78	9	36.1	328	106.1	7.2	x
PRSS22	brain-specific serine protease 4	11.35	3	14.4	103	41.2	7.3	x
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic	2.35	2	7.2	87	101.2	7.8	x
P15156	calcium-dependent serine proteinase	21.29	10	51.6	417	77.4	4.8	x
CALM1	Calmodulin	15.33	2	7.0	87	16.9	4.2	x
CALR	Calreticulin	9.11	3	10.7	80	48.2	4.5	x
CLSTN1	Calsyntenin-1	9.50	6	32.6	258	92.2	4.8	x
CALU	calumenin	6.03	2	7.4	70	37.0	4.7	x
CHST11	carbohydrate sulfotransferase 11	6.82	1	3.9		41.6	8.9	
CHST14	carbohydrate sulfotransferase 14	5.59	1	4.1	45	43.0	9.2	
CBR1	Carbonyl reductase	23.24	2	16.9	117	26.7	7.8	x
CAT	catalase	4.74	2	6.7	58	60.0	7.7	x
CTSB	cathepsin B	25.96	7	63.2	564	37.5	6.1	x
CTSD	cathepsin D	14.95	6	22.4	224	44.1	7.0	x
CTSL1	cathepsin L1	30.93	8	47.1	408	37.2	7.2	x
CCL2	c-C motif chemokine 2	11.89	2	13.0	95	15.8	9.2	x

N/A	CCHC-type zinc finger	7.93	1	4.3		18.1	7.4	
ALCAM	CD166 antigen	4.29	2	6.0	75	65.0	6.3	x
CD44	CD44 antigen isoform 5	5.85	2	6.1	65	39.4	5.9	x
CD63	CD63 antigen	4.31	1	3.0	43	25.5	7.6	
CLN5	Ceroid-lipofuscinosis neuronal protein 5	8.28	2	7.3	56	35.4	7.1	x
CLIC1	chloride intracellular channel protein 1	11.20	2	5.8		26.9	5.2	x
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4	x
CSPG4	chondroitin sulfate proteoglycan 4	9.21	15	54.0	446	251.9	5.7	x
CBX3	Chromobox protein homolog 3	7.82	1	5.4	70	20.4	5.3	
CLTC	clathrin heavy chain 1	1.37	2	7.2	73	191.6	5.8	x
CLU	clusterin	37.98	15	155.9	1224	51.5	5.8	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	9.13	2	5.3	44	23.9	9.6	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	11.18	3	12.5	118	38.9	9.4	x
CFL1	cofilin-1	31.93	3	11.6	60	18.5	8.1	x
CCDC80	coiled-coil domain-containing protein 80	16.14	9	39.6	312	107.4	9.7	x
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4	
COL6A1	Collagen alpha-1(VI) chain	10.34	7	21.6	179	88.9	6.6	x
COL5A2	Collagen alpha-2(V) chain	5.22	2	6.5	58	40.6	5.9	x
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	9.05	2	5.2	50	25.3	6.4	x
C1ra	Complement C1r-A subcomponent	7.81	4	17.1	208	79.9	6.1	x
C3	Complement C3	4.17	2	5.7	48	59.2	6.6	x
CFH	complement factor H, partial	4.04	2	7.2	43	72.7	6.7	x
CORO1B	coronin-1B	4.55	2	6.2	53	53.8	5.8	x
ABRACL	costars family protein C6orf115 homolog	11.11	1	3.5	52	9.0	5.8	
CAND1	cullin-associated NEDD8-dissociated protein 1	1.91	2	7.6	121	133.5	5.7	x
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8	
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4	
CSRP1	cysteine and glycine-rich protein 1	12.95	2	6.1	45	20.5	8.6	x
CRIP2	cysteine-rich protein 2	10.10	2	6.5	56	22.7	8.6	x
Cycs	cytochrome c, somatic	25.71	2	33.0	199	11.5	9.8	x
CNDP2	cytosolic non-specific dipeptidase	7.58	3	10.3	78	52.8	5.9	x
PHGDH	d-3-phosphoglycerate dehydrogenase-like	2.06	1	3.7	63	56.5	6.9	
DDT	D-dopachrome decarboxylase	24.58	2	5.3	91	13.1	7.1	x
DCN	decorin	33.15	10	111.7	720	40.1	8.4	x
DNASE2	Deoxyribonuclease-2-alpha	11.93	3	14.0	97	38.4	7.3	x

DPT	dermatopontin	9.45	2	5.8	48	24.0	4.9	x
DSTN	destrin	12.12	2	5.6	64	18.6	7.7	x
DKK3	dickkopf-related protein 3	18.39	4	29.6	392	38.3	4.5	x
DPP7	Dipeptidyl peptidase 2	9.92	4	12.1	72	53.1	6.6	x
DPP3	dipeptidyl peptidase 3	2.44	2	2.7	46	82.9	5.2	x
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	3.49	2	8.3	45	83.8	7.8	x
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0	
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1	
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	3.13	2	7.4		106.2	7.5	x
ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	3.72	2	6.6	64	91.8	7.7	x
DAG1	Dystroglycan	8.73	5	24.4	203	96.8	8.5	x
EFHD2	EF-hand domain-containing protein D2	25.66	2	4.1	87	12.8	5.4	x
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	9.60	2	6.9	42	42.0	5.4	x
EEF1A1	elongation factor 1-alpha 1	20.13	6	33.1	174	50.1	9.0	x
EEF1B2	elongation factor 1-beta	12.44	2	9.7	142	24.7	4.7	x
EEF1D	elongation factor 1-delta isoform 1	12.81	2	3.7	58	31.3	5.1	x
EEF1G	Elongation factor 1-gamma	5.72	2	8.1	94	50.0	6.6	x
EEF2	Elongation factor 2	3.61	3	6.5	84	95.2	6.6	x
HSP90B1	Endoplasmin	10.21	5	17.1	109	92.6	4.8	x
NPC2	epididymal secretory protein E1	14.09	2	8.7		16.5	8.0	x
EIF4A1	Eukaryotic initiation factor 4A-I	7.52	2	12.5	139	40.8	5.5	x
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	8.89	2	6.1		36.1	5.2	x
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.4	x
EIF3G	eukaryotic translation initiation factor 3 subunit G-like	4.06	1	3.0		35.7	5.9	
EIF3I	eukaryotic translation initiation factor 3 subunit I	3.69	1	6.4		36.3	5.6	
EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0	x
EIF5A	Eukaryotic translation initiation factor 5A-1	45.45	2	14.1	64	7.2	6.5	x
EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7	x
EXT2	Exostosin 2	9.49	2	7.9	94	35.7	8.6	x
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8	
ECM1	extracellular matrix protein 1	1.60	1	2.7		63.2	6.8	
CAPZB	F-actin-capping protein subunit beta	8.91	2	6.2	78	29.0	7.7	x
FDPS	Farnesyl pyrophosphate synthetase	6.13	2	6.8	62	43.2	7.8	x
FASN	Fatty acid synthase	2.02	2	7.8		206.1	6.7	x
FABP4	fatty acid-binding protein, adipocyte	19.70	2	7.2	46	14.7	7.9	
FTH1	Ferritin heavy chain	14.05	2	11.9	151	21.4	6.2	x
FN1	fibronectin isoform 2	15.03	24	96.6	672	262.9	5.9	x

FLNB	filamin-B isoform 3	0.81	2	6.2		275.1	5.7	x
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8	x
FSTL1	follistatin-related protein 1	13.40	3	19.0	186	34.6	5.7	x
ALDOA	fructose-bisphosphate aldolase A isoform 1	7.97	2	8.9	127	39.4	8.1	x
LGALS3	galectin-3	8.05	2	6.1	42	27.2	8.9	x
LGALS3BP	galectin-3-binding protein	12.89	5	15.2	191	63.8	5.2	x
GGH	Gamma-glutamyl hydrolase	9.96	2	11.8	125	30.9	7.5	x
IFI30	gamma-interferon-inducible lysosomal thiol reductase	16.67	2	10.4		27.4	5.2	x
GM2A	ganglioside GM2 activator	16.75	2	7.5	95	20.8	6.7	x
USO1	General vesicular transport factor p115	3.42	1	3.0	60	49.6	4.9	
GPI	glucose-6-phosphate isomerase	4.66	2	7.1	88	63.0	7.6	
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5	
GBA	glucosylceramidase	24.66	8	40.0	365	57.4	8.1	x
GSTP1	glutathione S-transferase P 1	48.57	8	31.3	253	23.6	7.8	x
Q00285	glutathione S-transferase Y1	29.36	4	22.0	267	26.0	8.4	x
GSS	glutathione synthetase	11.60	4	14.4	92	52.2	5.6	x
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	37.76	7	38.3	449	36.3	8.5	x
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4	
GARS	Glycyl-tRNA synthetase	1.67	1	3.3	54	74.4	6.4	
GPC1	glypican-1	6.27	3	11.8	169	78.5	7.3	x
GLG1	Golgi apparatus protein 1 precursor	1.72	2	6.1	108	132.2	6.8	x
GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2	x
GPR56	G-protein coupled receptor 56	1.45	1	2.8	59	77.3	8.8	
GRN	granulins isoform 2	4.90	2	9.3	51	63.9	6.4	x
GRN	granulins isoform 3	4.55	2	6.0	54	57.0	6.5	x
RAN	GTP-binding nuclear protein Ran	9.72	2	5.5	58	24.5	7.0	x
GNB2L1	Guanine nucleotide-binding protein subunit beta-2 1	13.77	2	7.8	54	30.4	7.4	x
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0	x
Cd74	H-2 class II histocompatibility antigen gamma chain	6.38	2	5.3	47	36.3	8.7	x
HSPA13	Heat shock 70 kDa protein 13	11.89	5	21.9	173	51.9	6.7	x
HSPA4	Heat shock 70 kDa protein 4	9.70	6	22.7	148	93.4	5.2	x
HSPA8	heat shock cognate 71 kDa protein	23.37	11	53.3	532	70.8	5.4	x
HSP90AB1	heat shock protein HSP 90-beta	16.71	10	37.5	235	83.1	5.0	x
HPSE	Heparanase	2.59	1	2.3		43.5	9.4	
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	8.53	2	5.1		23.7	9.6	x
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	5.1	42	11.3	9.9	
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	17.19	4	19.8	115	34.2	9.2	x

HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	24.76	2	11.5	97	12.0	6.1	x
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C 1 isoform 2	11.22	3	6.1	130	32.4	5.1	x
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	14.10	2	11.1	96	25.6	8.6	x
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	8.17	2	6.0		45.8	5.6	
RBMX	heterogeneous nuclear ribonucleoprotein G	9.00	2	7.8	84	31.5	9.8	x
HNRNPK	heterogeneous nuclear ribonucleoprotein K isoform 4	5.69	2	7.0	50	48.5	5.9	x
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4	
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	3.74	2	6.2	89	62.6	7.6	x
HNRNPU	heterogeneous nuclear ribonucleoprotein U	1.62	1	3.2		69.8	8.9	
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	8.67	2	5.6	44	32.3	9.1	x
HMGB1	High mobility group protein B1	17.50	3	15.7	140	27.8	6.3	x
HMGB2	High mobility group protein B2	5.03	1	2.6		18.2	5.4	
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1	4.2	68	8.0	6.8	
H1F0	Histone H1.0	11.34	2	9.2	108	20.9	10.9	x
HIST1H2AG	Histone H2A type 1	20.24	3	29.4	114	34.2	11.1	x
HIST1H2AG	Histone H2B type 1	26.98	2	10.8	169	13.9	10.3	x
HIST1H3A	Histone H3	19.10	2	28.4	104	29.6	11.1	x
HIST1H4A	Histone H4	21.36	2	6.5	61	11.4	11.4	x
RBBP7	histone-binding protein RBBP7	4.35	2	4.7	44	43.6	5.1	x
ST13	Hsc70-interacting protein	18.55	2	5.2	48	13.9	6.8	x
CDC37	hsp90 co-chaperone Cdc37	6.86	2	6.9	42	44.4	5.3	x
HAPLN4	hyaluronan and proteoglycan link protein 4	9.59	3	7.2	120	46.2	8.0	x
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic	4.62	2	5.4		57.3	5.7	x
N/A	hypothetical protein I79_018775	8.62	1		41	13.1	9.5	
N/A	hypothetical protein LOC100766349	10.13	2	6.4	80	25.5	9.9	x
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.2	97	19.7	8.7	x
HPRT1	hypoxanthine-guanine phosphoribosyltransferase	12.15	2	7.8	52	24.2	7.0	x
HYOU1	Hypoxia up-regulated protein 1	2.50	2	5.7	72	111.4	5.2	x
KPNB1	Importin subunit beta-1	4.34	3	9.5	49	97.1	4.8	x
IPO5	importin-5	2.15	2	7.9	134	120.3	4.9	x
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7	
PPA1	Inorganic pyrophosphatase	11.00	2	10.3		34.9	5.6	x
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	2.33	1	3.7	60	55.9	7.3	
ISYNA1	Inositol-3-phosphate synthase 1	3.46	1	2.3		50.3	5.6	
IGFBP4	insulin growth factor-binding protein 4	15.35	3	12.2	40	27.7	7.1	x
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	26.89	20	94.0	618	106.5	8.3	x
IFNAR2	Interferon-alpha/beta receptor beta chain	8.30	2	7.4	87	28.7	5.6	x

ILF2	interleukin enhancer-binding factor 2	6.15	2	7.6	105	43.0	5.3	x
ILF3	interleukin enhancer-binding factor 3	3.23	3	8.4	63	95.8	8.7	
IDH1	isocitrate dehydrogenase	5.56	2	7.4	119	46.7	7.0	
KRT77	Keratin, type II cytoskeletal 1b	5.39	2	10.8	113	93.4	5.5	x
MFGE8	Lactadherin	27.63	9	44.2	467	47.1	7.9	x
MFGE8	lactadherin, partial	11.37	3	10.2	172	32.3	5.7	x
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1	
LMNA	Lamin-A/C	6.04	3	10.0	101	64.0	8.0	x
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9	
LAMA5	laminin subunit alpha-5 isoform 1	15.98	44	183.9	1491	405.6	6.9	x
LAMB1	Laminin subunit beta-1	18.21	32	120.1	838	202.0	4.9	x
LAMC1	Laminin subunit gamma-1	17.82	19	78.5	695	170.3	5.1	x
N/A	Lamin-L(I)	2.28	1	3.1	53	54.9	4.9	
LTBP1	Latent-transforming growth factor beta-binding protein 1	3.89	2	9.0	86	93.7	4.5	x
LGMN	legumain	33.33	9	76.3	618	49.6	6.6	x
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9	
SERPINB1	Leukocyte elastase inhibitor A	6.33	2	7.3		42.9	6.2	x
LASP1	LIM and SH3 domain protein 1	19.38	4	13.8	86	25.8	5.9	x
LPL	Lipoprotein lipase	46.67	16	171.0	1083	50.5	7.9	x
LDHA	L-lactate dehydrogenase A chain	8.13	2	10.6	148	36.5	7.4	x
LDLR	low-density lipoprotein receptor precursor	4.57	3	11.5	143	94.5	4.9	x
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4	
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase	7.05	2	8.4	96	45.6	7.7	x
GAA	lysosomal alpha-glucosidase	13.91	9	29.1	241	105.8	6.0	x
MAN2B1	Lysosomal alpha-mannosidase	3.07	2	3.8	82	88.8	7.7	x
CTSA	Lysosomal protective protein	11.16	4	22.7	176	54.2	6.1	x
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	8.6	75	55.4	6.7	x
LOXL4	Lysyl oxidase 4	4.49	2	4.8	100	84.7	8.0	x
LOXL3	Lysyl oxidase homolog 3	12.81	2	8.7		23.5	6.4	x
KARS	lysyl-tRNA synthetase isoform 1	3.18	2	6.2		67.9	6.2	x
CSF1	macrophage colony-stimulating factor 1 isoform 2	7.39	2	6.4		29.5	7.4	x
MIF	macrophage migration inhibitory factor	17.39	2	3.0	185	12.4	7.3	x
CAPG	Macrophage-capping protein	7.87	2	6.1	67	33.3	5.8	x
MDH1	malate dehydrogenase, cytoplasmic	14.07	3	11.6	57	36.4	6.6	x
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7	
EPDR1	Mammalian ependymin-related protein 1	9.96	2	6.6	82	27.5	6.7	x
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	4.67	2	7.1	119	56.0	6.5	x

MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA, partial	6.74	3	11.9	129	71.5	6.7	x
MMP19	matrix metalloproteinase-19	31.43	11	53.4	439	58.9	7.9	x
MMP9	matrix metalloproteinase-9	10.00	6	20.0	104	78.8	5.9	x
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8	
TIMP1	metalloproteinase inhibitor 1	17.24	3	45.1	427	22.4	8.5	x
TIMP2	Metalloproteinase inhibitor 2	15.59	2	11.4	158	20.9	6.7	x
MAP6	microtubule-associated protein 6, partial	7.56	1	2.3		50.2	9.2	
MSN	moesin	3.36	2	5.9	80	66.5	6.3	x
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2	
MYL6	Myosin light polypeptide 6	19.08	2	7.8	62	17.3	4.6	x
MTPN	myotrophin	17.53	1	4.1	57	10.4	6.5	
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 1	21.68	3	16.3	237	37.2	7.5	x
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	14.98	4	15.9	142	34.2	6.9	x
GNS	N-acetylglucosamine-6-sulfatase	6.75	3	8.9		53.7	6.9	x
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.23	2	12.6	175	47.5	7.5	x
NACA	nascent polypeptide-associated complex subunit alpha	13.49	2	9.8	143	23.4	4.6	x
NPPB	natriuretic peptides B	31.40	3	27.3	196	13.4	10.1	x
NEO1	Neogenin	1.94	2	6.0	57	113.1	7.1	x
NTN4	Netrin-4	6.27	3	8.7	90	64.0	8.1	x
NCAM1	Neural cell adhesion molecule 1	9.09	2	6.7	64	30.2	5.2	x
NBL1	neuroblastoma suppressor of tumorigenicity 1	3.93	1	2.0		19.1	5.0	
NRP1	neuropilin-1	1.41	1	3.3	56	103.0	5.9	
SERPINI1	Neuroserpin	8.15	2	4.8		26.6	4.9	x
GANAB	neutral alpha-glucosidase AB isoform 2	3.18	2	7.5		106.9	6.0	
NCEH1	neutral cholesterol ester hydrolase 1	1.94	1	3.1	50	68.3	7.8	
NHP2L1	NHP2-like protein 1-like	16.44	1	2.9	62	8.0	7.9	
NID1	Nidogen-1	40.32	34	284.9	2709	136.1	5.1	x
Nid1	nidogen-1, partial	61.41	12	170.2	1070	54.6	6.4	x
NONO	non-POU domain-containing octamer-binding protein	2.82	1	8.4	48	48.9	8.0	
NSFL1C	NSFL1 cofactor p47 isoform 2	7.57	2	8.3	82	40.7	5.1	x
SGSH	N-sulphoglucosamine sulphohydrolase	6.18	2	7.0	89	56.5	6.5	x
NASP	nuclear autoantigenic sperm protein	1.30	1	2.8		83.4	4.4	
NUDC	Nuclear migration protein nudC	9.22	2	7.2		32.8	6.0	x
YBX1	Nuclease-sensitive element-binding protein 1	16.90	2	9.0	153	32.7	10.1	x
NUCB1	Nucleobindin-1	40.25	10	50.2	427	38.2	5.7	x
NUCB2	nucleobindin-2	31.43	13	58.5	490	50.3	5.1	x
NCL	Nucleolin	5.85	3	7.9	47	52.4	4.5	x

NPM1	Nucleophosmin	8.21	2	6.0	78	31.0	4.7	x
NME1	nucleoside diphosphate kinase A isoform 1	21.05	2	8.2		17.2	6.3	x
NME2	nucleoside diphosphate kinase B	28.29	2	10.9	137	17.3	8.0	x
NAP1L4	Nucleosome assembly protein 1 4	11.01	2	11.4	78	39.4	4.7	x
OLFML3	Olfactomedin protein 3	18.47	7	28.9	195	45.9	6.2	x
OAF	Out at first protein homolog	35.92	6	37.8	230	23.8	8.0	x
PPT1	palmitoyl-protein thioesterase 1	7.84	2	2.5	44	34.5	7.9	x
VNN1	Pantetheinase	5.27	2	7.4	131	56.7	5.5	x
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	7.29	4	11.0	100	94.7	6.5	x
PPIA	Peptidyl-prolyl cis-trans isomerase	25.61	4	13.0	180	17.9	8.3	x
PPIA	Peptidyl-prolyl cis-trans isomerase A	36.59	6	19.6	172	17.9	8.3	x
PPIB	peptidyl-prolyl cis-trans isomerase B	37.04	8	42.7	441	23.6	9.6	x
PPIC	Peptidyl-prolyl cis-trans isomerase C	19.38	2	8.1	95	17.5	6.4	x
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	28.70	2	9.7	88	11.9	8.7	
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3-like, partial	5.85	1	2.5	43	21.1	9.3	
FKBP9	peptidyl-prolyl cis-trans isomerase FKBP9	1.58	1	2.4		63.0	5.1	
PXDN	peroxidasin homolog	14.85	17	79.3	766	165.3	7.0	x
PRDX1	Peroxiredoxin-1	47.24	10	59.5	462	22.2	7.7	x
PRDX4	peroxiredoxin-4	8.50	2	13.7	144	38.8	8.4	x
PRDX6	peroxiredoxin-6, partial	12.79	2	6.6	70	24.5	6.8	x
PEBP1	Phosphatidylethanolamine-binding protein 1	16.58	2	4.0	87	20.9	7.1	x
PGM1	Phosphoglucomutase-1	2.23	1	3.6	84	58.5	5.6	
PGM2	phosphoglucomutase-2	2.10	1	3.4	80	69.0	6.3	
PGK1	phosphoglycerate kinase 1	5.28	2	5.8	41	44.5	7.9	x
PGAM1	Phosphoglycerate mutase 1	14.61	2	3.4	95	20.2	8.1	x
PLTP	Phospholipid transfer protein	10.89	4		210	50.6	6.0	x
PSPH	Phosphoserine phosphatase	6.38	1	2.4		15.7	6.2	
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein	2.73	1	2.4		37.4	7.1	
SERPINF1	Pigment epithelium-derived factor	22.73	6	19.0	192	46.4	6.9	x
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2	9.5	69	44.1	10.3	x
PLS3	plastin-3	5.24	3	10.6	129	70.8	5.7	x
PLA2G7	Platelet-activating factor acetylhydrolase	9.62	2	10.0	105	38.2	8.7	x
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8	x
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	0.86	1	5.5		129.5	6.3	
PLEC	plectin	0.60	2	6.0		533.6	5.9	x
PCBP2	Poly(rC)-binding protein 2	7.79	2	5.9		33.8	8.0	
PCBP2	poly(rC)-binding protein 2 isoform 4	9.63	2	8.3	65	33.9	8.2	x

PABPC1	Polyadenylate-binding protein 1	5.84	2	6.3	40	62.7	9.6	x
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9	
N/A	polyubiquitin	32.81	2	4.8		42.9	7.6	x
PFDN2	Prefoldin subunit 2	11.69	1		45	8.4	8.2	
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	6.4	63	69.2	8.9	x
CTSH	pro-cathepsin H	7.81	2	6.3	51	37.4	8.5	x
PCOLCE	procollagen C-endopeptidase enhancer 1	24.15	7	43.7	326	50.4	7.9	x
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	7.15	4	15.9	139	83.7	6.6	x
PFN1	Profilin-1	20.00	2	6.9		14.9	8.3	x
PA2G4	Proliferation-associated protein 2G4	7.55	2	6.8		41.1	8.0	x
PTGR1	prostaglandin reductase 1	10.94	2	7.2	60	35.7	7.2	x
PSME1	Proteasome activator complex subunit 1	12.56	2	7.0	66	24.5	5.4	x
PSME2	proteasome activator complex subunit 2 isoform 2	17.83	3	18.4	213	26.2	5.2	x
PSMA1	proteasome subunit alpha type-1	10.27	2	6.2	47	29.5	6.5	x
PSMA2	proteasome subunit alpha type-2	4.27	1	4.9		25.9	7.4	
PSMA3	proteasome subunit alpha type-3	10.20	2	7.8	109	28.4	5.3	x
PSMA4	proteasome subunit alpha type-4	14.56	2	8.6		29.5	7.7	x
PSMA5	proteasome subunit alpha type-5	12.86	2	10.3	72	26.4	4.8	x
PSMA6	proteasome subunit alpha type-6-like, partial	5.91	1	4.3	74	24.4	6.6	
PSMA7	Proteasome subunit alpha type-7	11.79	2	7.8	86	23.8	8.5	x
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0	
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5	
PSMB5	proteasome subunit beta type-5	3.80	1	3.2	42	28.7	7.0	
PSMB6	proteasome subunit beta type-6	8.97	2	6.5	77	24.7	5.1	x
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.52	2	5.2	57	40.5	5.6	x
CREG1	protein CREG1	9.55	1	3.8		24.1	8.0	
CYR61	Protein CYR61	6.50	2	6.9	60	39.1	8.1	x
P4hb	Protein disulfide-isomerase	11.96	2	6.4	74	21.1	4.6	x
PDIA3	Protein disulfide-isomerase A3	5.41	2	9.5	83	50.0	5.7	x
PDIA4	Protein disulfide-isomerase A4	4.83	2	7.2	75	72.5	5.2	
PDIA6	Protein disulfide-isomerase A6	10.04	2	6.6	77	28.4	4.9	x
PARK7	protein DJ-1	22.22	2	9.9	92	19.9	6.8	x
FAM3C	protein FAM3C	31.72	5	26.5	301	24.7	8.3	x
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3	
S100A11	protein S100-A11	27.00	2	9.6	66	11.2	7.1	x
S100A13	Protein S100-A13	23.47	2	7.3	95	11.2	5.3	x
S100A6	protein S100-A6	19.10	2	8.4	77	10.0	5.5	x

SET	Protein SET	14.53	2	10.7	103	33.3	4.3	x
SHISA5	protein shisa-5	12.81	2	8.1		25.9	6.5	x
PNP	Purine nucleoside phosphorylase	7.42	2	10.2	100	31.4	6.7	x
PLBD2	putative phospholipase B 2	31.97	11	83.6	635	65.5	6.3	x
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.89	1	2.8		61.4	8.6	
PDXK	pyridoxal kinase-like	11.11	1	3.1	67	9.6	10.7	
PKM	pyruvate kinase isozymes M1/M2 isoform 1	14.31	6	20.6	178	57.9	7.3	x
N/A	pyruvate kinase isozymes M1/M2 isoform 2	10.07	4	16.1	138	49.8	6.6	x
GDI2	rab GDP dissociation inhibitor beta	6.74	2	7.7	82	50.5	6.3	x
RDX	radixin	13.04	3	28.2	197	68.5	6.3	
RANBP1	Ran-specific GTPase-activating protein	11.34	2	6.3		22.6	5.2	x
IQGAP1	Ras GTPase-activating protein IQGAP1	1.29	2	6.3	40	185.6	6.7	
YPT1	Ras GTP-binding protein YPT1	22.92	2	6.6	80	10.9	5.1	x
RAB11A	ras-related protein Rab-11A isoform 1	5.09	1	2.6		24.4	6.6	
RAB7A	ras-related protein Rab-7a	14.98	3	7.8	53	23.5	6.7	x
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2.92	2	10.2	100	90.9	4.7	x
ATP6AP2	Renin receptor	12.00	3	8.7		33.8	5.2	x
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8	
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	8.43	3	9.7	41	55.5	8.0	x
RARRES2	Retinoic acid receptor responder protein 2	27.08	2	3.6	47	16.4	9.1	x
SCPEP1	Retinoid-inducible serine carboxypeptidase	9.96	3	16.7	190	50.9	5.7	x
ARHGDIA	Rho GDP-dissociation inhibitor 1	15.20	2	6.6		23.4	5.3	x
RNASE4	ribonuclease 4	36.05	3	16.0	44	17.0	9.3	x
RNH1	ribonuclease inhibitor-like	4.33	1	3.4		25.2	4.8	
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7	
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7	
SEMA3B	Semaphorin-3B	7.21	2	7.6		37.3	6.8	x
SEMA3C	Semaphorin-3C	2.80	2	7.2	78	85.2	8.7	x
SEMA3E	Semaphorin-3E	2.57	2	7.1	77	85.2	7.7	x
SEMA4B	Semaphorin-4B	4.33	2	6.1		49.0	7.2	x
HTRA1	Serine protease HTRA1	41.67	8	35.6	398	34.1	7.2	x
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	5.76	2	5.8	40	37.5	6.3	x
SERPINB6	serpin B6 isoform 1	5.29	2	6.9	83	43.1	5.9	x
SERPINH1	Serpin H1	5.76	2	7.4	63	46.5	8.7	
ESD	S-formylglutathione hydrolase	13.23	2	8.9	60	28.2	6.5	x
SH3BGRL2	SH3 domain-binding glutamic acid-rich protein	20.18	2	6.2	85	12.7	5.1	x

SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	13.89	1		55	8.0	6.6	
SIAE	sialate O-acetylesterase	11.45	5	18.7	202	61.4	8.2	x
NEU1	Sialidase-1	6.91	2	7.8	96	36.4	5.5	x
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3	
SLITRK4	SLIT and NTRK protein 4	1.21	1	2.6		92.7	7.9	
SNRPD2	Small nuclear ribonucleoprotein Sm D2	25.42	3	13.0		13.5	9.8	x
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.8	9.0	x
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5	
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	7.7	65	31.0	7.1	x
CANT1	soluble calcium-activated nucleotidase 1	5.75	2	7.1	103	45.2	6.6	x
SORD	sorbitol dehydrogenase	2.24	1	2.8		38.3	7.7	
SPARC	SPARC	25.08	5	32.5	276	34.9	4.8	x
SMPD1	Sphingomyelin phosphodiesterase	6.41	2	7.4	126	66.2	7.0	x
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7	
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	3.42	1		42	40.2	6.7	
U2AF2	Splicing factor U2AF 65 kDa subunit	3.79	1	3.5	42	45.7	4.9	
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.4	42	22.3	7.9	x
SFPQ	splicing factor, proline- and glutamine-rich	5.31	2	3.1	57	49.4	7.9	x
STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9	x
STIP1	Stress-induced-phosphoprotein 1	6.81	3	10.7	43	62.6	6.8	x
Psap	Sulfated glycoprotein 1	17.84	9	67.6	596	58.2	5.5	x
QSOX1	Sulfhydryl oxidase 1	12.02	6	30.8	267	70.3	7.9	x
SULT1C2	sulfotransferase 1C2	4.01	1	2.2		35.3	8.3	
SOD1	superoxide dismutase	14.88	2	11.5	85	25.9	9.6	x
SBSN	suprabasin	29.00	10	49.1	531	63.3	7.4	x
VAT1	Synaptic vesicle membrane protein VAT-1	15.06	3	11.2	113	28.5	7.6	x
SDC4	syndecan-4	18.81	3	21.6	114	22.2	4.6	x
TCP1	T-complex protein 1 subunit alpha	5.58	2	9.9	141	60.3	6.0	x
CCT2	T-complex protein 1 subunit beta	4.30	2	5.9	48	57.5	6.5	x
CCT4	T-complex protein 1 subunit delta	6.05	2	6.6	51	42.1	8.3	x
CCT5	T-complex protein 1 subunit epsilon isoform 1	4.99	2	10.3	143	59.5	5.5	x
CCT7	T-complex protein 1 subunit eta	4.21	2	5.9	68	54.9	7.4	x
CCT3	T-complex protein 1 subunit gamma	3.85	2	5.5	41	60.6	6.6	x
CCT8	T-complex protein 1 subunit theta	9.57	2	6.7	92	24.8	5.3	x
CCT6A	T-complex protein 1 subunit zeta	4.90	2	5.4		57.9	6.9	x
THOP1	thimet oligopeptidase	6.40	3	8.0	84	78.1	6.0	x

TXN	thioredoxin	28.92	2	7.9	68	9.1	4.7	x
TXNRD1	thioredoxin reductase 1	5.81	2	6.1	64	54.7	6.8	x
THBS1	thrombospondin-1	10.94	9	28.9	226	129.6	4.9	x
THBS3	Thrombospondin-3	4.09	2	5.9	54	61.4	4.3	x
FUCA1	Tissue alpha-L-fucosidase	4.37	2	6.5	75	52.8	6.5	x
TFPI	tissue factor pathway inhibitor	3.34	2	3.2	44	34.4	8.2	x
PLAT	Tissue-type plasminogen activator	3.09	1		40	50.8	7.9	
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3	
TALDO1	Transaldolase	17.51	6	23.5	133	37.4	6.7	x
TAGLN2	transgelin-2	20.60	3	11.4	95	22.4	8.6	x
VCP	Transitional endoplasmic reticulum ATPase	5.83	4	14.1	119	89.3	5.3	x
TKT	transketolase	9.31	3	14.3	102	67.7	7.6	x
TPT1	Translationally-controlled tumor protein	16.20	2	6.6	70	15.9	5.0	
TPI1	Triosephosphate isomerase	26.67	2	13.9	130	16.4	8.2	x
TPP1	Tripeptidyl-peptidase 1	35.70	12	93.4	880	61.5	6.5	x
TPM3	tropomyosin alpha-3 chain isoform 2	10.93	2	8.6	129	28.8	4.8	x
TPM2	Tropomyosin beta chain	8.68	2	7.3	71	30.7	4.8	x
TPM2	tropomyosin beta chain, partial	7.36	1	6.5	47	29.9	4.6	
TUBA1A	Tubulin alpha-1A chain	12.90	2		102	20.6	6.2	
TUBA1C	tubulin alpha-1C chain	8.69	3	11.0	105	49.9	5.1	x
TUBB2A	Tubulin beta-2 chain	19.81	2	17.7	159	46.5	5.0	x
TUBB3	Tubulin beta-3 chain	3.52	1	6.9	71	85.4	6.0	
TINAG	tubulointerstitial nephritis antigen	13.55	4	23.4	167	52.5	7.1	x
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	7.7	77	33.6	6.2	x
TNFRSF21	Tumor necrosis factor receptor superfamily member 21	4.60	2	7.7		71.3	7.5	x
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3	
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0	x
UBA1	ubiquitin modifier-activating enzyme 1	2.93	2	7.0		117.6	5.7	x
UBE2N	Ubiquitin-conjugating enzyme E2 N	20.39	2	8.0	68	17.1	6.6	x
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2, partial	13.10	2	8.2	52	15.4	4.9	x
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.77	2	5.9	52	42.3	9.3	x
UGDH	UDP-glucose 6-dehydrogenase, partial	8.52	2	6.6	74	29.4	7.6	x
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1	x
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3	
RAD23B	UV excision repair protein RAD23 homolog B-like	6.94	3	8.2	71	43.7	4.9	
VPS35	Vacuolar protein sorting-associated protein 35	0.88	1	2.3		91.6	5.4	
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5	

VASN	vasorin	13.52	5	32.6	275	72.5	7.5	
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	3.4	85	26.8	7.8	
VIM	vimentin	15.26	6	19.1	138	44.5	4.8	x
VCL	vinculin isoform 1	2.16	2	6.5		116.6	6.0	x
PROS1	Vitamin K-dependent protein S	6.68	4	14.2	145	74.6	5.7	x
ATP6AP1	V-type proton ATPase subunit S1	15.42	5	22.6	179	48.9	6.0	x
WDR1	WD repeat-containing protein 1	5.21	3	8.3	52	58.8	7.1	x

Table 3.3.46: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line at 37˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	4.8	78	11.0	9.5
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	1.34	1	2.3		109.4	5.0
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0
RPS10	40S ribosomal protein S10	4.97	1	2.8	59	20.4	10.1
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2
RPS24	40S ribosomal protein S24	17.24	1	4.2	63	10.0	10.6
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
ACTR2	Actin-related protein 2	8.23	1	5.0		17.7	5.9
ARPC4	Actin-related protein 2/3 complex subunit 4	6.59	1	2.6	40	19.5	8.4
ADM	ADM	22.28	2	9.8	82	20.6	10.2
ARF1	ADP-ribosylation factor 1	18.23	2	8.6	104	20.7	6.3
ARF1	ADP-ribosylation factor 1, partial	23.08	1	4.1	89	7.3	5.3
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1
AMPD2	AMP deaminase 2	1.42	1	2.2	50	81.3	6.5
AREG	Amphiregulin	3.48	1	2.6		25.3	8.2
ANG	angiogenin	6.90	1	3.1	42	16.5	9.3
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
LFNG	beta-1,3-N-acetylglucosaminyltransferase lunatic fringe	3.97	1	3.4	41	41.6	8.7
PNKP	bifunctional polynucleotide phosphatase/kinase	2.68	1	2.6		57.2	8.2
ATIC	bifunctional purine biosynthesis protein PURH	3.38	2	5.7		64.6	7.0
BDNF	Brain-derived neurotrophic factor	6.75	1	3.9		26.6	8.5
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
CD81	CD81 antigen isoform 1	6.78	1	2.8		25.8	5.5
ARCN1	coatomer subunit delta	2.15	1	2.9	57	57.2	6.2
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
CCBE1	Collagen and calcium-binding EGF domain-containing protein 1	4.29	1	2.6		32.5	6.7

C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
CORO1C	coronin-1C	1.69	1	2.2		53.1	7.1
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	2.89	1	3.1	54	43.1	10.4
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
DLG5	disks large homolog 5	2.56	1	2.3		27.8	6.9
DNAJB9	dnaJ homolog subfamily B member 9	7.21	1	4.8	42	25.6	8.3
DNAJB3	DnaJ subfamily C member 3	1.99	1	3.4	51	57.5	5.8
RAD18	E3 ubiquitin-protein ligase RAD18	2.43	1	2.3		55.8	8.1
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1
MAN1B1	endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase, partial	3.86	1		49	56.0	6.4
SGCE	Epsilon-sarcoglycan	3.05	1	2.4		37.1	6.7
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
EIF4A2	eukaryotic initiation factor 4A-II isoform 3	4.17	1	4.7	83	36.2	7.4
EIF1B	Eukaryotic translation initiation factor 1b	12.39	1	3.9	81	12.8	7.4
EIF3E	Eukaryotic translation initiation factor 3 subunit E	3.42	1	2.4		30.7	6.9
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
XPO1	exportin-1	2.05	1	5.0		122.9	6.1
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8
FER1L6	Fer-1 protein 6	2.65	1	2.6		36.3	5.2
FKBP3	FK506-binding protein 3	7.77	1	2.6		10.6	6.8
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GSR	Glutathione reductase, mitochondrial	5.24	2	6.8		45.9	7.0
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
Gsta3	glutathione S-transferase alpha-3	17.65	2	8.8	124	25.4	8.0
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
GSTO1	glutathione S-transferase omega-1 isoform 3	11.06	2	5.0	71	23.5	7.7
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
HDGF	Hepatoma-derived growth factor	10.05	1	5.3		20.9	4.5
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	4.82	1		42	24.5	9.7
H2AFX	Histone H2A.x	27.27	2	25.0	120	15.1	10.9

HIST3H3	Histone H3.1t	9.69	1	6.4	167	35.8	10.7
N/A	hypothetical protein I79_016815	8.00	1		54	12.8	11.1
N/A	hypothetical protein I79_021924	9.35	1	3.2	40	13.2	4.4
N/A	hypothetical protein LOC100755523	12.50	1	5.6		7.9	7.7
INHBB	inhibin beta B chain	5.35	1	3.8		35.9	7.2
IL1R1	Interleukin-1 receptor 1	11.18	5	43.3	227	37.6	9.0
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5
KRT10	Keratin, type I cytoskeletal 10	12.35	3	7.1	120	27.8	4.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
KRT5	keratin, type II cytoskeletal 5	1.80	1	2.4		54.4	5.4
KRT71	Keratin, type II cytoskeletal 71	4.41	2	26.1	157	133.3	6.6
KRT8	keratin, type II cytoskeletal 8	4.10	1	6.2	72	54.3	5.8
LTBP3	latent-transforming growth factor beta-binding protein 3	0.81	1	3.2		146.0	6.4
ACP1	low molecular weight phosphotyrosine protein phosphatase	7.69	1	4.0	63	18.0	7.7
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
LOXL1	Lysyl oxidase homolog 1	4.23	1	5.4	76	36.9	6.4
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
MDP1	Magnesium-dependent phosphatase 1	11.50	1	3.4		12.9	6.5
PRNP	Major prion protein	9.16	1	4.1		15.3	6.8
MMP14	Matrix metalloproteinase-14	1.67	1	2.4		60.7	8.5
MBTPS1	Membrane-bound transcription factor site-1 protease	1.85	1	3.0		65.9	9.0
MANF	Mesencephalic astrocyte-derived neurotrophic factor	7.82	1	3.9		20.4	8.3
WDR77	Methylosome protein 50	5.30	1	9.3		29.8	4.8
CLNS1A	methylosome subunit pICln	5.51	1	4.1	80	26.1	4.1
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
eb1	microtubule-associated protein RP/EB family member 1	7.46	1		43	30.0	5.2
TOMM22	mitochondrial import receptor subunit TOM22 homolog	8.45	1	4.5	76	15.5	4.3
MAPK1	Mitogen-activated protein kinase 1	5.07	2	7.1	41	41.0	7.0
Nlrp9a	NACHT, LRR and PYD domains-containing protein 9A	2.29	1	2.7		59.4	6.1
SLC1A4	Neutral amino acid transporter A	2.54	1	3.0		41.8	5.1
NBR1	Next to BRCA1 gene 1 protein	1.50	1	2.5		95.7	5.6
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NUTF2	nuclear transport factor 2	11.11	1	4.4		14.4	5.4
GTPBP4	nucleolar GTP-binding protein 1	2.05	1	2.7		74.0	9.5

NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
OLA1	Obg ATPase 1	5.17	1	10.4	174	31.9	8.5
NIT2	omega-amidase NIT2	3.62	1	2.9	40	30.5	7.4
PDLIM1	PDZ and LIM domain protein 1	3.65	1	3.2		35.9	7.1
PPID	peptidyl-prolyl cis-trans isomerase D, partial	3.37	1	2.6	50	29.4	6.4
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
PIP5K1A	phosphatidylinositol-4-phosphate 5-kinase protein 1	3.54	1	2.3		45.8	9.8
PIR	pirin	7.59	2	10.6	108	32.1	6.5
PAFAH1B2	platelet-activating factor acetylhydrolase IB subunit beta, partial	6.77	1	2.9	63	14.5	6.4
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	3.3	59	23.2	8.8
KCNH4	potassium voltage-gated channel subfamily H member 4	1.51	1	2.6		115.7	8.8
TSR2	Pre-rRNA-processing protein TSR2	13.45	1	4.9	66	13.2	4.4
DDX6	probable ATP-dependent RNA helicase DDX6 isoform 1	4.97	1	6.0	51	54.3	8.7
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0
PRMT5	Protein arginine N-methyltransferase 5	1.73	1	3.6	41	66.3	5.7
Ctla2b	protein CTLA-2-beta	34.00	2	9.2	91	11.8	5.1
CUTA	Protein CutA	9.79	1	3.5		15.4	5.5
HEG1	protein HEG homolog 1	0.94	1	2.8		113.7	6.2
POMGNT1	protein O-linked-mannose beta-1,2-N-acetylglucosaminyltransferase 1 isoform 2	2.08	1	3.4		71.6	6.6
PPP1R12A	protein phosphatase 1 regulatory subunit 12A	1.23	1	3.5	52	109.5	5.4
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
TANC2	Protein TANC2	0.41	1		50	217.5	7.6
TPST1	protein-tyrosine sulfotransferase 1	3.29	1	3.4	47	41.4	9.3
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6
SLC38A10	putative sodium-coupled neutral amino acid transporter 10 isoform 1	1.01	1	2.7		117.8	5.5
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.9	60	50.4	5.6
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	2.90	1	2.9	53	50.7	5.3
RAC3	ras-related C3 botulinum toxin substrate 3	6.76	1	3.6		16.7	8.6
RAB39A	Ras-related protein Rab-39A	12.64	1	3.2	48	10.2	9.5
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.9		20.8	5.8
RPA1	Replication protein A 70 kDa DNA-binding subunit	3.39	2	6.1	47	68.5	7.9
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9

PKN1	serine/threonine-protein kinase N1	1.02	1	5.4		109.0	6.6
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1
SNRPE	small nuclear ribonucleoprotein E	11.96	1	2.6	60	10.8	8.7
SNRPG	Small nuclear ribonucleoprotein G	13.73	1	2.3		5.7	8.0
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
UBE2I	SUMO-conjugating enzyme UBC9	7.59	1	3.4		18.0	8.7
TXNDC12	Thioredoxin domain-containing protein 12	8.82	1	5.0		19.0	5.8
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
ALYREF	THO complex subunit 4	7.01	1	3.4		16.8	10.1
THBD	Thrombomodulin	4.27	1	4.1		35.4	4.7
THUMPD1	THUMP domain-containing protein 1	3.90	1	2.6		40.3	6.5
TCEB2	Transcription elongation factor B polypeptide 2	6.78	1	2.3		13.1	5.0
PURB	Transcriptional activator protein Pur-beta	10.47	1	2.5		9.6	5.0
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TGFB1	transforming growth factor beta-1, partial	7.35	1	5.3	45	31.2	8.2
TGFB2	Transforming growth factor beta-2	1.55	1	2.3		44.6	8.6
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8
TUBA4A	tubulin alpha-4A chain	6.24	1	7.5	84	48.3	5.0
TUBB2B	tubulin beta-2B chain	20.54	1	27.0	150	49.6	4.9
TUBB4B	tubulin beta-4B chain	19.03	2	15.5	191	41.8	4.9
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFRSF12A	tumor necrosis factor receptor superfamily member 12A isoform 1	22.58	1	6.1		13.0	7.6
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
LSM2	U6 snRNA-associated Sm protein LSm2	12.50	1	3.2		9.9	6.5
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8
ZNF829	zinc finger protein 829	1.48	1	3.6	77	70.3	8.5
PAICS	Multifunctional protein ADE2	12.64	1	2.9	64	9.5	7.9
PTHLH	parathyroid hormone-related protein-like	6.25	1	2.6	42	20.2	10.7

Table 3.3.47: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line at 37˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	5.0		42.3	8.0
PPID	40 kDa peptidyl-prolyl cis-trans isomerase	4.09	1	2.2		24.0	6.0
RPS13	40S ribosomal protein S13	5.30	1		49	15.2	10.3
RPS23	40S ribosomal protein S23	7.75	1	3.2	56	15.9	9.9
RPS3A	40S ribosomal protein S3a, partial	16.83	2	4.7	51	11.4	9.9
RPL13	60S ribosomal protein L13	11.34	2	6.2	73	22.4	11.8
RPL13A	60S ribosomal protein L13a	9.40	1	2.7	54	13.6	10.6
RPL14	60S ribosomal protein L14	4.49	1	3.1	61	29.5	11.0
RPL26	60S ribosomal protein L26	11.03	2	4.7		17.2	10.7
RPL27	60S ribosomal protein L27	15.45	2	7.1	45	12.1	10.1
RPL27A	60S ribosomal protein L27a	7.63	1	2.4		14.6	9.9
RPL31	60S ribosomal protein L31	7.20	1	2.5	58	14.3	10.0
RPL35	60S ribosomal protein L35	8.20	1	2.8		14.4	10.7
RPL7	60S ribosomal protein L7	12.94	1	3.5	64	10.0	10.0
RPL8	60S ribosomal protein L8	8.33	1	2.9	56	14.1	10.6
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	2.98	2	5.1	43	77.3	7.6
ADAMTS4	A disintegrin and metalloproteinase with thrombospondin motifs 4	2.93	1		42	95.6	8.2
ACTA1	actin, alpha skeletal muscle A	12.64	1	50.9	243	9.7	8.5
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
ACTR3B	Actin-related protein 3B	3.03	1	2.7	49	41.7	6.6
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.80	2	6.8		38.1	5.5
ADK	Adenosine kinase	3.32	1	3.5		40.2	6.6
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2, partial	1.21	1	2.4		72.1	6.1
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.18	2	4.6		54.4	6.4
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
BLVRA	biliverdin reductase A	4.75	1	3.4	59	33.2	6.1
BAZ2B	Bromodomain adjacent to zinc finger domain protein 2B	0.54	1	2.3		205.6	6.1

CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3
CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
CAPRIN1	Caprin-1	3.35	2	7.2	86	73.6	5.2
CPD	Carboxypeptidase D	0.90	1	2.8	59	123.4	6.2
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
P21926	CD9 antigen	6.29	1	3.1		17.7	6.7
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
CBX1	chromobox protein homolog 1	14.05	2	7.5	50	21.4	4.9
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
COL16A1	collagen alpha-1(XVI) chain	1.13	1	4.7	65	156.3	7.7
CTGF	Connective tissue growth factor	4.60	1	4.3		38.1	7.9
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
SPRR1A	cornifin-A	28.32	1	2.2		12.4	7.9
CRIM1	Cysteine-rich motor neuron 1 protein	3.49	1	2.9		37.6	4.9
CRELD1	cysteine-rich with EGF domain protein 1	2.86	1	2.2		45.7	5.1
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
LAP3	Cytosol aminopeptidase	6.71	3	8.5	103	50.2	6.9
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
CTBS	Di-N-acetylchitobiase	5.15	1	2.5	57	32.9	5.7
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5
DDB1	DNA damage-binding protein 1	2.54	3	7.4		126.8	5.3
MCM2	DNA replication licensing factor MCM2	2.43	2	7.0	91	102.1	5.6
MCM3	DNA replication licensing factor MCM3	2.11	1	3.8		90.7	5.5
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4
NEDD4	E3 ubiquitin-protein ligase NEDD4	3.07	2	2.8	72	108.4	5.7
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0
EFEMP1	EGF-containing fibulin extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
ELAVL1	ELAV protein 1	3.88	1	3.5	72	37.1	9.2
EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
MAN1B1	Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase	3.86	1	3.0		29.7	6.5
EDF1	Endothelial differentiation-related factor 1	14.15	1	12.1	70	11.7	10.0
env	Envelope glycoprotein	2.28	1	4.2	42	73.5	7.7

MAN2B2	Epididymis-specific alpha-mannosidase	2.99	2	7.6	69	111.3	7.5
EIF4A3	Eukaryotic initiation factor 4A-III	6.45	1	5.1		32.4	7.0
ETF1	eukaryotic peptide chain release factor subunit 1	3.22	1	3.4	54	45.4	5.5
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.12	2	8.5	75	91.4	5.1
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
EIF3L	eukaryotic translation initiation factor 3 subunit L	1.42	1	2.9	48	66.6	6.3
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
gag	Gag polyprotein	6.13	1	2.9		19.6	8.7
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
GSTM2	glutathione S-transferase Mu 2	22.00	0	9.5	106	23.6	5.1
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
PLA2G15	group XV phospholipase A2	2.75	1	2.3		33.7	6.5
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	2.8	59	30.5	5.2
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
HNRNPC	heterogeneous nuclear ribonucleoprotein C 1 isoform 1	7.97	2	7.2	134	33.1	5.0
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	6.27	2	3.2	54	45.2	7.6
H2AFZ	Histone H2A.Z	16.50	1	7.6		11.1	10.3
Hist3h2ba	histone H2B type 3-A	11.90	1	15.2	304	14.0	10.4
RBBP4	Histone-binding protein RBBP4	4.04	1		40	25.3	6.3
HAPLN1	hyaluronan and proteoglycan link protein 1	2.54	1	2.2		40.3	7.8
HMGCS2	hydroxymethylglutaryl-CoA synthase, mitochondrial	2.17	1	3.4	54	57.2	8.6
N/A	hypothetical protein I79_011206	3.13	1	3.9	45	69.3	6.3
N/A	hypothetical protein I79_015376	2.46	4	10.3	114	231.1	5.6
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8
ITM2B	integral membrane protein 2B	4.89	1		46	30.3	5.1
IDI1	isopentenyl-diphosphate Delta-isomerase 1	5.29	1	3.0	52	26.3	5.9
KDELC2	KDEL motif-containing protein 2	1.99	1		41	52.4	7.5
KGFLP1	keratinocyte growth factor	4.64	1	2.3		22.4	9.1
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2
LAMA3	laminin subunit alpha-3	0.34	1	3.7	50	350.8	6.8
LTA4H	leukotriene A-4 hydrolase	2.13	1	3.1	48	69.1	6.3

LPCAT1	Lysophosphatidylcholine acyltransferase 1	3.65	1	2.2		21.7	10.3
PPT2	lysosomal thioesterase PPT2	5.96	1	4.4	47	34.3	6.5
MSLN	mesothelin	1.92	1	5.7	49	69.8	6.4
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6
GALNS	N-acetylgalactosamine-6-sulfatase	2.07	1	3.3	54	54.0	6.9
GALNT7	N-acetylgalactosaminyltransferase 7	2.14	1	4.0	70	69.7	7.5
PGLYRP2	N-acetylmuramoyl-L-alanine amidase	2.02	1	2.9	42	64.8	6.9
UBE2M	NEDD8-conjugating enzyme Ubc12	5.42	1	2.8		22.9	4.7
NENF	neudesin	11.29	2	2.7	45	20.4	7.8
ULBP1	NKG2D ligand 1	4.73	1	2.5		19.3	8.4
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
OR10X1	olfactory receptor 10X1	3.23	1	8.2		34.4	8.6
OSMR	oncostatin-M-specific receptor subunit beta	1.34	1		40	110.4	6.2
Q86UD1	Out at first protein	14.47	2	4.5		17.7	8.1
PALLD	Palladin	3.17	1	2.3		42.1	8.6
PAPLN	Papilin	2.89	2		79	127.2	7.3
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
PLIN4	perilipin-4	14.55	3	8.0	71	184.1	8.4
POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
PFDN1	prefoldin subunit 1	9.02	1	2.8	59	14.2	6.8
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3
PDCD5	programmed cell death protein 5	8.46	1	2.4	43	14.9	6.9
PROSC	Proline synthetase co-transcribed bacterial protein	11.21	2	8.3	56	24.8	6.4
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
PTGES3	prostaglandin E synthase 3	6.21	1	2.6		18.9	4.6
PSME3	Proteasome activator complex subunit 3	10.28	1	7.3	107	12.0	8.3
PSMB1	Proteasome subunit beta type-1	10.00	1	4.5	78	15.6	8.1

TTLL8	protein monoglycylase TTLL8	1.08	1	2.4		95.4	8.5
RCC2	Protein RCC2	3.77	1	3.6	49	31.9	7.0
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
N/A	putative allantoicase	1.10	1	2.3	47	80.2	7.9
MEFV	Pyrin	1.46	1	2.3		76.3	7.1
RSU1	ras suppressor protein 1	3.25	1	2.2		31.5	8.6
Ptprs	Receptor-type tyrosine-protein phosphatase S	1.75	1	2.6		56.0	5.1
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
SEPT11	septin-11	4.47	2	5.9	53	49.0	7.0
SEPT9	septin-9	3.71	2	6.1	42	63.7	8.3
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
SH2D3C	SH2 domain-containing protein 3C	1.10	1	4.7		90.7	8.5
NANS	sialic acid synthase	2.79	1		56	40.2	6.9
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9
SPTAN1	Spectrin alpha chain, brain	1.33	2	3.4	68	258.7	5.4
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9
SPTBN4	spectrin beta chain, brain 4	0.28	1	2.3		403.9	6.3
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
O60687	Sushi repeat-containing protein SRPX2	4.24	1	3.2		32.2	7.8
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TGFBR2	TGF-beta receptor type-2 isoform 1	2.65	1	12.3		64.3	6.0
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9
BTF3	transcription factor BTF3	17.90	2	2.7	65	17.7	6.9
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	5.7	44	107.5	6.8
TSKU	tsukushin	3.95	1	4.0		38.1	6.6
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7

TTLL12	tubulin--tyrosine ligase protein 12	5.31	3	10.1	58	74.1	5.6
ZRSR1	U2 small nuclear ribonucleoprotein auxiliary factor 35 kDa subunit-related protein 1	2.34	1	2.3		51.0	9.1
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3
N/A	uncharacterized protein C12orf29 homolog	4.31	1	2.3		37.3	7.3
N/A	Uncharacterized protein KIAA0319	2.11	1		62	104.3	6.1
PLAUR	Urokinase plasminogen activator surface receptor	5.38	1	2.3	43	20.3	5.1
NSF	Vesicle-fusing ATPase	26.00	1	3.5	46	5.5	6.6
NSF	vesicle-fusing ATPase, partial	14.29	1	2.6		8.6	5.4
LMAN2	vesicular integral-membrane protein VIP36	5.62	2	6.1	53	40.2	6.9
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	19.67	1		45	7.2	9.1
RAN	GTP-binding nuclear protein Ran, partial	24.54	5	13.5	88	24.5	8.3
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	5.85	1	3.2		22.8	5.6
VCAM1	vascular cell adhesion protein 1, partial	2.61	1	2.9		42.5	4.8

Table 3.3.48: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line at 37˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2
SLC3A2	4F2 cell-surface antigen heavy chain	7.54	2	6.1		44.2	5.7
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ABHD14A	Abhydrolase domain-containing protein 14A	12.68	2	6.4		23.9	9.5
ADM	ADM	22.28	2	9.8	82	20.6	10.2
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8
ATIC	bifunctional purine biosynthesis protein PURH	3.38	2	5.7		64.6	7.0
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
C1QTNF1	complement C1q tumor necrosis factor-related protein 1	7.47	2	9.3	85	31.8	6.9
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	12.65	2	11.2	72	45.4	5.0
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8

FABP4	fatty acid-binding protein, adipocyte	19.70	2	7.2	46	14.7	7.9
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GPI	glucose-6-phosphate isomerase	4.66	2	7.1	88	63.0	7.6
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5
GSR	Glutathione reductase, mitochondrial	5.24	2	6.8		45.9	7.0
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
Gsta3	glutathione S-transferase alpha-3	17.65	2	8.8	124	25.4	8.0
GSTO1	glutathione S-transferase omega-1 isoform 3	11.06	2	5.0	71	23.5	7.7
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	5.1	42	11.3	9.9
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5
IDH1	isocitrate dehydrogenase	5.56	2	7.4	119	46.7	7.0
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
KRT71	Keratin, type II cytoskeletal 71	4.41	2	26.1	157	133.3	6.6
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
MAMDC2	MAM domain-containing protein 2	4.05	2	4.9		53.3	5.7
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2
GANAB	neutral alpha-glucosidase AB isoform 2	3.18	2	7.5		106.9	6.0
NHLRC3	NHL repeat-containing protein 3	13.38	2	2.3	49	17.0	6.7
NAMPT	Nicotinamide phosphoribosyltransferase	5.24	2	5.5	59	45.8	6.5
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
PIR	pirin	7.59	2	10.6	108	32.1	6.5

GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	5.02	2	7.7	88	75.6	6.5
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0
Ctla2b	protein CTLA-2-beta	34.00	2	9.2	91	11.8	5.1
PDIA4	Protein disulfide-isomerase A4	4.83	2	7.2	75	72.5	5.2
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6
IQGAP1	Ras GTPase-activating protein IQGAP1	1.29	2	6.3	40	185.6	6.7
RPA3	replication protein A 14 kDa subunit	29.75	2	7.6		13.6	4.8
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7
SERPINH1	Serpin H1	5.76	2	7.4	63	46.5	8.7
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5
CTTN	src substrate cortactin isoform 1	7.29	2	6.6	87	49.0	5.1
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TPT1	Translationally-controlled tumor protein	16.20	2	6.6	70	15.9	5.0
TUBB4B	tubulin beta-4B chain	19.03	2	15.5	191	41.8	4.9
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8

ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1
EIF4A2	eukaryotic initiation factor 4A-II	9.34	3	10.6	125	46.4	5.5
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
ILF3	interleukin enhancer-binding factor 3	3.23	3	8.4	63	95.8	8.7
KRT10	Keratin, type I cytoskeletal 10	12.35	3	7.1	120	27.8	4.5
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6
RDX	radixin	13.04	3	28.2	197	68.5	6.3
FTH1	Ferritin heavy chain	20.97	3	14.2	197	21.5	6.2
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6
IL1R1	Interleukin-1 receptor 1	11.18	5	43.3	227	37.6	9.0
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8
VASN	vasorin	13.52	5	32.6	275	72.5	7.5
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1, partial	14.10	7	29.0	217	81.5	6.6
PPIA	Peptidyl-prolyl cis-trans isomerase A	63.41	8	32.9	211	17.9	8.3
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0

Table 3.3.49: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line at 37˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAE	14-3-3 protein epsilon	60.95	6	19.2	224	11.9	5.8
RPS19	40S ribosomal protein S19-like, partial	16.91	2	11.9		15.1	10.5
RPS3A	40S ribosomal protein S3a-like, partial	16.83	2	4.7	51	11.4	9.9
RPL13	60S ribosomal protein L13	11.34	2	6.2	73	22.4	11.8
RPL27	60S ribosomal protein L27	15.45	2	7.1	45	12.1	10.1
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	2.98	2	5.1	43	77.3	7.6
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	1.42	2	7.0	80	177.6	5.8
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	2	5.7	76	28.5	4.1
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
NAGLU	alpha-N-acetylglucosaminidase-like	2.84	2	3.2	61	83.4	6.7
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9
DHX9	ATP-dependent RNA helicase A	1.30	2	7.8	90	144.3	6.9
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3
CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
CCL7	c-C motif chemokine 7	23.71	2	6.5		11.0	8.9
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
CDNF	cerebral dopamine neurotrophic factor	16.58	2	4.2	45	21.3	5.6
CBX1	chromobox protein homolog 1	14.05	2	7.5	50	21.4	4.9
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6
LAP3	Cytosol aminopeptidase	6.71	3	8.5	103	50.2	6.9
PHGDH	d-3-phosphoglycerate dehydrogenase-like	4.88	2	7.1	82	56.5	6.9
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5

DDB1	DNA damage-binding protein 1-like	2.54	3	7.4		126.8	5.3
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0
EFEMP1	EGF-containing fibulin extracellular matrix protein 1-like, partial	34.55	12	53.9	436	48.9	4.9
EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
MAN2B2	Epididymis-specific alpha-mannosidase	2.99	2	7.6	69	111.3	7.5
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
EIF3I	eukaryotic translation initiation factor 3 subunit I	8.62	2	7.2	55	36.3	5.6
ECM1	extracellular matrix protein 1	4.09	2	7.0	70	63.2	6.8
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
GARS	glycyl-tRNA synthetase	3.10	2	5.9	53	79.8	6.8
GPR56	G-protein coupled receptor 56	3.20	2	32.4	290	77.3	8.8
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
HPSE	heparanase	4.83	2	6.3		60.9	9.0
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	7.97	2	7.2	134	33.1	5.0
HNRNPU	Heterogeneous nuclear ribonucleoprotein U	5.27	2	7.1	115	57.6	9.3
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	6.03	2	10.4	43	55.9	7.3
ISYNA1	Inositol-3-phosphate synthase 1	8.37	2	3.1	81	46.9	5.7
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6
NRP1	neuropilin-1	3.90	2	7.6	98	103.0	5.9
NONO	Non-POU domain-containing octamer-binding protein	4.89	2	9.7	44	69.6	5.2
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4
NASP	nuclear autoantigenic sperm protein	2.47	2	5.5	56	83.4	4.4
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
PAPLN	Papilin	2.89	2		79	127.2	7.3
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
PLIN4	perilipin-4-like	14.55	3	8.0	71	184.1	8.4
POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
PGM1	Phosphoglucomutase-1	4.90	2	6.6	105	62.8	5.9

PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
PSPH	phosphoserine phosphatase	7.56	2	4.8	46	25.0	5.5
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
PFDN2	prefoldin subunit 2	16.88	2	5.6	82	16.7	6.6
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3
PROSC	Proline synthetase co-transcribed bacterial-like protein	11.21	2	8.3	56	24.8	6.4
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
PSMA2	proteasome subunit alpha type-2	15.38	2	10.9	68	25.9	7.4
PSMB5	proteasome subunit beta type-5	8.75	2	6.6	77	28.7	7.0
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
PDXK	pyridoxal kinase-like	12.81	2	3.1	111	27.0	5.5
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
RNH1	ribonuclease inhibitor-like	4.82	2	6.0	69	50.0	4.8
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7
SEPT11	septin-11-like	4.47	2	5.9	53	49.0	7.0
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6
SORD	sorbitol dehydrogenase	6.44	2	2.4	47	38.3	7.7
SPTAN1	Spectrin alpha chain, brain	1.33	2	3.4	68	258.7	5.4
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9
PLAT	tissue-type plasminogen activator	4.29	2	5.4	73	63.0	8.2
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	5.7	44	107.5	6.8
TPM2	tropomyosin beta chain, partial	13.95	2	10.6	84	29.9	4.6
TUBA1A	Tubulin alpha-1A chain	19.29	6	21.6	250	50.1	5.1
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1

TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7
TTLL12	tubulin--tyrosine ligase-like protein 12	5.31	3	10.1	58	74.1	5.6
LMAN2	vesicular integral-membrane protein VIP36	5.62	2	6.1	53	40.2	6.9

Table 3.3.50: HCPs from the cell culture supernatant of a non-producing CHO K1 and an IgG secreting DP12 cell line identified with one or more peptides as being common to both cell lines at 31˚C. Proteins identified with two or more peptides as being common to both cell lines are also indicated.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	2 or more peptides common
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	4.8	78	11.0	9.5	
YWHAB	14-3-3 protein beta/alpha isoform 2	22.54	3	21.7	241	27.8	4.8	x
YWHAE	14-3-3 protein epsilon, partial	33.33	4	16.5	80	11.9	5.8	x
YWHAH	14-3-3 protein eta	17.89	2	17.9	86	28.2	4.9	x
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0	
YWHAQ	14-3-3 protein theta	21.63	2	19.3	123	27.7	4.8	x
YWHAZ	14-3-3 protein zeta/delta	17.55	2	11.8	122	27.7	4.8	x
PSMC6	26S protease regulatory subunit 10B	2.83	1	4.1	66	44.1	7.5	
PSMD4	26S proteasome non-ATPase regulatory subunit 4	16.84	4	15.2	163	41.1	4.8	x
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.7	
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	2.6		42.3	8.0	
RPS10	40S ribosomal protein S10	4.97	1	2.8	59	20.4	10.1	
RPS12	40S ribosomal protein S12	21.97	2	12.1		14.5	6.7	
RPS15A	40S ribosomal protein S15a	17.69	2	8.3	66	14.8	10.1	x
RPS16	40S ribosomal protein S16	16.06	2	6.3	81	15.7	10.2	
RPS18	40S ribosomal protein S18	28.68	4	12.6	67	15.7	10.4	x
RPS19	40S ribosomal protein S19	23.68	2	4.8		8.3	9.2	
RPS19	40S ribosomal protein S19, partial	16.91	2	11.9		15.1	10.5	x
RPS2	40S ribosomal protein S2	12.90	2	5.5	40	20.4	9.5	x
RPS20	40S ribosomal protein S20	15.00	2	5.6	48	13.4	9.9	
RPS21	40S ribosomal protein S21	22.89	2	6.7	51	9.1	8.3	x
RPS25	40S ribosomal protein S25	15.13	2	6.2	56	13.5	10.9	x
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0	
RPS27	40S ribosomal protein S27	22.41	1	3.7	69	6.8	8.0	
RPS3	40S ribosomal protein S3	11.93	2	7.3	66	26.7	9.7	x
FAU	40S ribosomal protein S30	16.95	1	2.4		6.6	12.1	
RPS3A	40S ribosomal protein S3a	7.58	2	8.8	58	29.9	9.7	
RPS6	40S ribosomal protein S6	31.34	2	6.2		7.6	5.0	x
RPS8	40S ribosomal protein S8	13.46	2	7.3	47	24.2	10.3	x
RPS9	40S ribosomal protein S9	14.62	2	4.8	56	14.8	10.8	

RPSA	40S ribosomal protein SA	13.41	2	7.2	61	19.7	9.3	x
SDF4	45 kDa calcium-binding protein	22.82	6	27.6	225	41.2	4.9	x
RPLP0	60S acidic ribosomal protein P0	7.72	2	6.1	43	29.9	8.5	x
RPLP2	60S acidic ribosomal protein P2	25.22	2	8.9	120	11.7	4.5	x
RPL11	60S ribosomal protein L11	13.17	2	6.2	66	19.0	9.8	x
RPL11	60S ribosomal protein L11-like, partial	18.18	1	3.7	66	8.8	10.4	
RPL12	60S ribosomal protein L12	49.25	3	16.9	121	14.7	9.6	x
RPL13	60S ribosomal protein L13	5.67	1	2.5	44	22.4	11.8	
RPL15	60S ribosomal protein L15, partial	10.61	2	7.2	75	23.5	11.6	
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8	
RPL23	60S ribosomal protein L23	25.00	2	9.9	89	14.9	10.5	
RPL23A	60S ribosomal protein L23a	32.84	2	3.3	72	7.6	8.4	x
RPL26	60S ribosomal protein L26-like	24.14	4	10.6	56	17.2	10.7	x
RPL27	60S ribosomal protein L27	9.52	1		41	9.4	10.7	
RPL29	60S ribosomal protein L29	9.65	1	6.0	56	12.4	11.5	
RPL3	60S ribosomal protein L3	7.44	2	7.5	71	46.1	10.2	x
RPL30	60S ribosomal protein L30	42.55	2	11.0	97	10.5	9.3	
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0	
RPL5	60S ribosomal protein L5	9.46	2	6.9		34.2	9.8	x
Rpl6	60S ribosomal protein L6	14.53	2	4.9	41	13.6	9.9	x
PGD	6-phosphogluconate dehydrogenase, decarboxylating	4.55	2	5.6	45	53.3	6.6	x
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	3.40	2	7.0	112	77.3	7.6	x
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7	1.42	2	7.0	80	177.6	5.8	x
ACAT2	acetyl-CoA acetyltransferase, cytosolic	10.08	2	6.9	100	41.0	7.3	x
ASAH1	Acid ceramidase	11.14	3	11.8	71	44.6	7.9	x
ACTA1	actin, alpha skeletal muscle	24.93	1	34.3	212	42.0	5.4	
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.51	1		49	38.1	5.5	
DBI	acyl-CoA-binding protein	32.18	2	5.7	42	10.0	8.8	x
CRKL	adapter molecule crk	8.56	2	11.9	130	36.1	5.7	
APRT	adenine phosphoribosyltransferase	16.67	2	9.2		19.4	6.0	x
AHCY	adenosylhomocysteinase	4.40	2	5.9	59	47.6	6.5	x
AK2	Adenylate kinase 2, mitochondrial	21.13	2	12.7	49	15.4	7.9	x
ADSL	Adenylosuccinate lyase	4.55	2	4.5		54.9	6.9	x
CAP1	adenylyl cyclase-associated protein 1 isoform 1	6.33	2	7.6	64	51.5	7.3	x
ADM	ADM	22.28	2	9.8	82	20.6	10.2	
AARS	Alanyl-tRNA synthetase, cytoplasmic	2.73	2	7.3		104.8	5.6	x
AKR1A1	alcohol dehydrogenase	13.27	3	12.6	89	36.5	7.1	x

AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1	
AKR1B1	aldose reductase	8.54	2	8.0	43	35.8	7.4	x
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1	
ACTN1	Alpha-actinin-1	7.31	2	17.7	239	102.7	5.5	x
ACTN4	Alpha-actinin-4	13.56	2	12.4	154	33.7	4.9	x
ENO1	alpha-enolase	21.21	7	32.4	246	46.7	6.2	x
GLA	Alpha-galactosidase A	13.49	3	11.6	86	38.5	5.0	
IDUA	alpha-L-iduronidase	4.06	2	2.7	44	72.1	6.8	x
NAGA	alpha-N-acetylgalactosaminidase	22.89	5	29.0	261	47.2	7.8	x
NAGLU	alpha-N-acetylglucosaminidase	2.84	2	3.2	61	83.4	6.7	x
APP	Amyloid beta A4 protein	24.10	14	75.5	620	84.7	4.8	x
APLP2	Amyloid protein 2	13.48	7	22.5	57	84.8	4.8	x
ANXA1	Annexin A1	13.29	3	13.3	79	38.8	7.0	x
ANXA2	annexin A2, partial	11.89	2	8.4	84	25.4	6.0	x
ANXA5	annexin A5	7.79	2	7.2	69	36.0	5.0	x
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	1.21	1	4.2		72.1	6.1	
ARSA	arylsulfatase A	8.88	2	8.1	94	55.0	5.1	x
GOT1	aspartate aminotransferase, cytoplasmic	6.05	2	7.2	68	46.2	7.2	x
DARS	Aspartyl-tRNA synthetase, cytoplasmic	2.39	1	2.3		47.8	6.3	
ABCF1	ATP-binding cassette sub-family F member 1-like	1.31	1	2.7		95.4	6.5	
DHX9	ATP-dependent RNA helicase A	7.02	8	19.1	148	144.3	6.9	x
DDX39A	ATP-dependent RNA helicase DDX39	6.60	3	7.6	60	48.7	5.8	x
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	23.66	24	450.9	3732	471.6	6.5	x
GLB1	Beta-galactosidase	3.38	2	6.0	46	73.6	6.9	x
GUSB	Beta-glucuronidase	8.64	2	8.2		27.9	7.9	x
HEXA	beta-hexosaminidase subunit alpha	5.87	2	7.9	73	60.6	6.5	
HEXB	Beta-hexosaminidase subunit beta	4.22	2	5.2	44	49.0	6.6	x
ATIC	bifunctional purine biosynthesis protein PURH	3.38	2	5.7		64.6	7.0	x
BLVRA	biliverdin reductase A-like	4.75	1	4.8	85	33.2	6.1	
BTD	biotinidase	5.03	2	7.0	81	60.1	6.1	x
BMP1	bone morphogenetic protein 1	11.78	9	36.1	328	106.1	7.2	x
PRSS22	brain-specific serine protease 4	11.35	3	14.4	103	41.2	7.3	x
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic	2.35	2	7.2	87	101.2	7.8	x
P15156	calcium-dependent serine proteinase	21.29	10	51.6	417	77.4	4.8	x
CALM1	Calmodulin	15.33	2	7.0	87	16.9	4.2	x

CALR	Calreticulin	9.11	3	10.7	80	48.2	4.5	x
CLSTN1	Calsyntenin-1	9.50	6	32.6	258	92.2	4.8	x
CALU	calumenin	6.03	2	7.4	70	37.0	4.7	x
CAPRIN1	Caprin-1	3.35	2	5.8	73	73.6	5.2	x
CHST14	carbohydrate sulfotransferase 14	5.59	1	4.1	45	43.0	9.2	
CBR1	Carbonyl reductase	23.24	2	16.9	117	26.7	7.8	x
CAT	catalase	4.74	2	6.7	58	60.0	7.7	x
CTSB	cathepsin B	25.96	7	63.2	564	37.5	6.1	x
CTSD	cathepsin D	14.95	6	22.4	224	44.1	7.0	x
CTSL1	cathepsin L1	30.93	8	47.1	408	37.2	7.2	x
CCL2	c-C motif chemokine 2	11.89	2	13.0	95	15.8	9.2	x
CD44	CD44 antigen isoform 5	5.85	2	6.1	65	39.4	5.9	x
CLN5	Ceroid-lipofuscinosis neuronal protein 5	8.28	2	7.3	56	35.4	7.1	
CLIC1	chloride intracellular channel protein 1	11.20	2	5.8		26.9	5.2	x
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4	
CSPG4	chondroitin sulfate proteoglycan 4	9.21	15	54.0	446	251.9	5.7	x
CBX1	chromobox protein homolog 1	14.59	2	7.7	89	21.4	4.9	x
CBX3	chromobox protein homolog 3	16.39	2	11.1	104	20.8	5.3	x
CLTC	clathrin heavy chain 1	1.37	2	7.2	73	191.6	5.8	
CLU	clusterin	37.98	15	155.9	1224	51.5	5.8	x
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	9.13	2	5.3	44	23.9	9.6	x
ARCN1	coatomer subunit delta	2.15	1	2.9	57	57.2	6.2	
CFL1	cofilin-1	31.93	3	11.6	60	18.5	8.1	x
CCDC80	coiled-coil domain-containing protein 80	16.14	9	39.6	312	107.4	9.7	x
CIRBP	Cold-inducible RNA-binding protein	5.98	1	3.5	53	19.8	9.6	
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4	
COL6A1	Collagen alpha-1(VI) chain	10.34	7	21.6	179	88.9	6.6	x
COL5A2	Collagen alpha-2(V) chain	5.22	2	6.5	58	40.6	5.9	x
C1ra	Complement C1r-A subcomponent	7.81	4	17.1	208	79.9	6.1	x
C3	Complement C3	4.17	2	5.7	48	59.2	6.6	x
COPS4	COP9 signalosome complex subunit 4	2.46	1	3.1	76	46.3	5.8	
CORO1B	coronin-1B	4.55	2	6.2	53	53.8	5.8	x
CAND1	cullin-associated NEDD8-dissociated protein 1	1.91	2	7.6	121	133.5	5.7	
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8	
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4	
CSRP1	cysteine and glycine-rich protein 1	12.95	2	6.1	45	20.5	8.6	

CRIP2	cysteine-rich protein 2	10.10	2	6.5	56	22.7	8.6	
Cycs	cytochrome c, somatic	25.71	2	33.0	199	11.5	9.8	x
LAP3	Cytosol aminopeptidase	5.19	2	6.1	48	50.2	6.9	x
CNDP2	cytosolic non-specific dipeptidase	7.58	3	10.3	78	52.8	5.9	x
PHGDH	d-3-phosphoglycerate dehydrogenase	4.88	2	7.1	82	56.5	6.9	x
DDT	D-dopachrome decarboxylase	24.58	2	5.3	91	13.1	7.1	x
DCN	decorin	33.15	10	111.7	720	40.1	8.4	x
DNASE2	Deoxyribonuclease-2-alpha	11.93	3	14.0	97	38.4	7.3	x
DPT	dermatopontin	9.45	2	5.8	48	24.0	4.9	
DSTN	destrin	12.12	2	5.6	64	18.6	7.7	
DKK3	dickkopf-related protein 3	18.39	4	29.6	392	38.3	4.5	x
DPP7	Dipeptidyl peptidase 2	9.92	4	12.1	72	53.1	6.6	x
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	3.49	2	8.3	45	83.8	7.8	x
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	3.13	2	7.4		106.2	7.5	
ADAM9	Disintegrin and metalloproteinase domain-containing protein 9	3.72	2	6.6	64	91.8	7.7	
DDB1	DNA damage-binding protein 1-like	0.88	1	2.4		126.8	5.3	
DNAJC8	dnaJ homolog subfamily C member 8-like	3.95	1	3.0		29.8	9.1	
DAG1	Dystroglycan	8.73	5	24.4	203	96.8	8.5	x
NEDD4	E3 ubiquitin-protein ligase NEDD4-like	2.01	2	5.9	61	108.4	5.7	x
EFEMP2	EGF-containing fibulin extracellular matrix protein 2	9.60	2	6.9	42	42.0	5.4	
EEF1A1	elongation factor 1-alpha 1	20.13	6	33.1	174	50.1	9.0	x
EEF1B2	elongation factor 1-beta	12.44	2	9.7	142	24.7	4.7	
EEF1D	elongation factor 1-delta isoform 1	12.81	2	3.7	58	31.3	5.1	x
EEF1G	Elongation factor 1-gamma	5.72	2	8.1	94	50.0	6.6	x
EEF2	Elongation factor 2	3.61	3	6.5	84	95.2	6.6	x
HSP90B1	Endoplasmin	10.21	5	17.1	109	92.6	4.8	x
NPC2	epididymal secretory protein E1	14.09	2	8.7		16.5	8.0	
MAN2B2	Epididymis-specific alpha-mannosidase	1.96	1	4.6	44	111.3	7.5	
EIF4A1	Eukaryotic initiation factor 4A-I	7.52	2	12.5	139	40.8	5.5	x
EIF4A3	Eukaryotic initiation factor 4A-III	3.58	1	2.5		32.4	7.0	
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.88	1	3.8		65.3	6.3	
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	8.89	2	6.1		36.1	5.2	x
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.4	
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.37	2	15.1	84	91.4	5.1	x
EIF3I	eukaryotic translation initiation factor 3 subunit I	3.69	1	6.4		36.3	5.6	
EIF3L	eukaryotic translation initiation factor 3 subunit L-like	1.77	1	2.7		66.6	6.3	
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.20	2	4.9		174.8	5.4	x

EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0	
EIF5A	Eukaryotic translation initiation factor 5A-1	45.45	2	14.1	64	7.2	6.5	x
EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7	
ECM1	extracellular matrix protein 1	1.60	1	2.7		63.2	6.8	
EZR	Ezrin	14.51	3	30.7	161	69.3	6.4	x
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8	
CAPZB	F-actin-capping protein subunit beta	8.91	2	6.2	78	29.0	7.7	x
FDPS	Farnesyl pyrophosphate synthetase	6.13	2	6.8	62	43.2	7.8	x
FASN	Fatty acid synthase	2.02	2	7.8		206.1	6.7	x
FABP4	fatty acid-binding protein, adipocyte	19.70	2	7.2	46	14.7	7.9	x
FTH1	Ferritin heavy chain	14.05	2	11.9	151	21.4	6.2	x
FN1	fibronectin isoform 2	15.03	24	96.6	672	262.9	5.9	x
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8	
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3	
FSTL1	follistatin-related protein 1	13.40	3	19.0	186	34.6	5.7	x
ALDOA	fructose-bisphosphate aldolase A isoform 1	7.97	2	8.9	127	39.4	8.1	x
LGALS3BP	galectin-3-binding protein	12.89	5	15.2	191	63.8	5.2	x
IFI30	gamma-interferon-inducible lysosomal thiol reductase	16.67	2	10.4		27.4	5.2	
GM2A	ganglioside GM2 activator	16.75	2	7.5	95	20.8	6.7	x
GPI	glucose-6-phosphate isomerase	4.66	2	7.1	88	63.0	7.6	x
PRKCSH	glucosidase 2 subunit beta isoform 2	5.90	2	10.7	71	59.1	4.5	
GBA	glucosylceramidase	24.66	8	40.0	365	57.4	8.1	x
GSR	Glutathione reductase, mitochondrial	5.24	2	6.8		45.9	7.0	x
Gsta3	glutathione S-transferase alpha-3	17.65	2	8.8	124	25.4	8.0	x
GSTM5	glutathione S-transferase Mu 5-like	33.92	6	33.7	319	26.9	6.7	x
Gstm6	glutathione S-transferase Mu 6-like	32.11	5	18.3	159	25.5	6.9	x
GSTO1	glutathione S-transferase omega-1 isoform 3	11.06	2	5.0	71	23.5	7.7	x
GSTP1	glutathione S-transferase P 1	48.57	8	31.3	253	23.6	7.8	x
Q00285	glutathione S-transferase Y1	29.36	4	22.0	267	26.0	8.4	x
GSS	glutathione synthetase	11.60	4	14.4	92	52.2	5.6	x
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	37.76	7	38.3	449	36.3	8.5	x
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4	
GARS	Glycyl-tRNA synthetase	1.67	1	3.3	54	74.4	6.4	
GPC1	glypican-1	6.27	3	11.8	169	78.5	7.3	x
GLG1	Golgi apparatus protein 1 precursor	1.72	2	6.1	108	132.2	6.8	x
GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2	
GRN	granulins isoform 3	4.55	2	6.0	54	57.0	6.5	x

RAN	GTP-binding nuclear protein Ran	9.72	2	5.5	58	24.5	7.0	x
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	4.8		30.5	5.2	
GNB2L1	Guanine nucleotide-binding protein subunit beta-2 1	13.77	2	7.8	54	30.4	7.4	x
Cd74	H-2 class II histocompatibility antigen gamma chain	6.38	2	5.3	47	36.3	8.7	x
HSPA13	Heat shock 70 kDa protein 13	11.89	5	21.9	173	51.9	6.7	x
HSPA4	Heat shock 70 kDa protein 4	9.70	6	22.7	148	93.4	5.2	x
HSPA8	heat shock cognate 71 kDa protein	23.37	11	53.3	532	70.8	5.4	x
HSP90AB1	heat shock protein HSP 90-beta	16.71	10	37.5	235	83.1	5.0	x
HPSE	Heparanase	2.59	1	2.3		43.5	9.4	
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	8.53	2	5.1		23.7	9.6	x
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	17.19	4	19.8	115	34.2	9.2	x
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	24.76	2	11.5	97	12.0	6.1	x
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C 1 isoform 2	11.22	3	6.1	130	32.4	5.1	x
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	22.92	6	17.1	206	33.1	5.0	x
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	14.10	2	11.1	96	25.6	8.6	x
RBMX	heterogeneous nuclear ribonucleoprotein G	9.00	2	7.8	84	31.5	9.8	x
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	14.46	4	17.9	65	45.2	7.6	x
HNRNPK	heterogeneous nuclear ribonucleoprotein K isoform 4	5.69	2	7.0	50	48.5	5.9	x
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4	
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	3.74	2	6.2	89	62.6	7.6	x
HNRNPU	heterogeneous nuclear ribonucleoprotein U	6.46	3	11.2	56	69.8	8.9	x
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	8.67	2	5.6	44	32.3	9.1	x
HMGB1	High mobility group protein B1	17.50	3	15.7	140	27.8	6.3	x
HMGB2	High mobility group protein B2	5.03	1	2.6		18.2	5.4	
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1	4.2	68	8.0	6.8	
H1F0	Histone H1.0	11.34	2	9.2	108	20.9	10.9	x
HIST1H2AG	Histone H2A type 1	20.24	3	29.4	114	34.2	11.1	x
HIST1H2AG	Histone H2B type 1	26.98	2	10.8	169	13.9	10.3	x
HIST1H3A	Histone H3	19.10	2	28.4	104	29.6	11.1	x
HIST1H4A	Histone H4	21.36	2	6.5	61	11.4	11.4	x
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3	
RBBP7	histone-binding protein RBBP7	4.35	2	4.7	44	43.6	5.1	
ST13	Hsc70-interacting protein	18.55	2	5.2	48	13.9	6.8	x
CDC37	hsp90 co-chaperone Cdc37	6.86	2	6.9	42	44.4	5.3	
HAPLN4	hyaluronan and proteoglycan link protein 4	9.59	3	7.2	120	46.2	8.0	x
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic	4.62	2	5.4		57.3	5.7	x
N/A	hypothetical protein I79_015376	2.85	2	9.3	79	231.1	5.6	x

N/A	hypothetical protein LOC100766349	10.13	2	6.4	80	25.5	9.9	x
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.2	97	19.7	8.7	x
HPRT1	hypoxanthine-guanine phosphoribosyltransferase	12.15	2	7.8	52	24.2	7.0	x
HYOU1	Hypoxia up-regulated protein 1	2.50	2	5.7	72	111.4	5.2	x
KPNB1	Importin subunit beta-1	4.34	3	9.5	49	97.1	4.8	x
IPO5	importin-5	2.15	2	7.9	134	120.3	4.9	x
PRSS35	inactive serine protease 35	8.25	2	8.6	95	46.0	9.7	
PPA1	Inorganic pyrophosphatase	11.00	2	10.3		34.9	5.6	x
IMPA1	Inositol monophosphatase	4.66	1	3.4	42	25.6	6.8	
ISYNA1	Inositol-3-phosphate synthase 1	3.46	1	2.3		50.3	5.6	
IGFBP4	insulin growth factor-binding protein 4	15.35	3	12.2	40	27.7	7.1	x
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	26.89	20	94.0	618	106.5	8.3	x
IFNAR2	Interferon-alpha/beta receptor beta chain	8.30	2	7.4	87	28.7	5.6	
ILF2	interleukin enhancer-binding factor 2	6.15	2	7.6	105	43.0	5.3	
ILF3	interleukin enhancer-binding factor 3	3.23	3	8.4	63	95.8	8.7	x
IL1R1	Interleukin-1 receptor 1	11.18	5	43.3	227	37.6	9.0	x
IDH1	isocitrate dehydrogenase	5.56	2	7.4	119	46.7	7.0	x
IDI1	isopentenyl-diphosphate Delta-isomerase 1-like	5.29	1	3.0		26.3	5.9	
KRT10	Keratin, type I cytoskeletal 10	12.35	3	7.1	120	27.8	4.5	x
KRT77	Keratin, type II cytoskeletal 1b	5.39	2	10.8	113	93.4	5.5	x
KRT71	Keratin, type II cytoskeletal 71	4.41	2	26.1	157	133.3	6.6	x
MFGE8	Lactadherin	27.63	9	44.2	467	47.1	7.9	x
MFGE8	lactadherin, partial	11.37	3	10.2	172	32.3	5.7	x
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1	x
LMNA	Lamin-A/C	6.04	3	10.0	101	64.0	8.0	x
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9	x
LAMA5	laminin subunit alpha-5 isoform 1	15.98	44	183.9	1491	405.6	6.9	x
LAMB1	Laminin subunit beta-1	18.21	32	120.1	838	202.0	4.9	x
LAMC1	Laminin subunit gamma-1	17.82	19	78.5	695	170.3	5.1	x
N/A	Lamin-L(I)	2.28	1	3.1	53	54.9	4.9	
MESDC2	LDLR chaperone MESD-like	4.42	1	2.6		25.1	6.3	
LGMN	legumain	33.33	9	76.3	618	49.6	6.6	x
SERPINB1	Leukocyte elastase inhibitor A	6.33	2	7.3		42.9	6.2	x
LASP1	LIM and SH3 domain protein 1	19.38	4	13.8	86	25.8	5.9	x
LPL	Lipoprotein lipase	46.67	16	171.0	1083	50.5	7.9	x
LDHA	L-lactate dehydrogenase A chain	8.13	2	10.6	148	36.5	7.4	x
LDLR	low-density lipoprotein receptor precursor	4.57	3	11.5	143	94.5	4.9	x

LIPA	lysosomal acid lipase/cholesteryl ester hydrolase	7.05	2	8.4	96	45.6	7.7	x
GAA	lysosomal alpha-glucosidase	13.91	9	29.1	241	105.8	6.0	x
MAN2B1	Lysosomal alpha-mannosidase	3.07	2	3.8	82	88.8	7.7	x
CTSA	Lysosomal protective protein	11.16	4	22.7	176	54.2	6.1	x
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	8.6	75	55.4	6.7	
LOXL4	Lysyl oxidase 4	4.49	2	4.8	100	84.7	8.0	
LOXL3	Lysyl oxidase homolog 3	12.81	2	8.7		23.5	6.4	x
KARS	lysyl-tRNA synthetase isoform 1	3.18	2	6.2		67.9	6.2	
CSF1	macrophage colony-stimulating factor 1 isoform 2	7.39	2	6.4		29.5	7.4	x
MIF	macrophage migration inhibitory factor	17.39	2	3.0	185	12.4	7.3	
CAPG	Macrophage-capping protein	7.87	2	6.1	67	33.3	5.8	x
MDH1	malate dehydrogenase, cytoplasmic	14.07	3	11.6	57	36.4	6.6	x
EPDR1	Mammalian ependymin-related protein 1	9.96	2	6.6	82	27.5	6.7	x
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	4.67	2	7.1	119	56.0	6.5	x
MMP19	matrix metalloproteinase-19	31.43	11	53.4	439	58.9	7.9	x
MMP9	matrix metalloproteinase-9	10.00	6	20.0	104	78.8	5.9	x
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8	
TIMP1	metalloproteinase inhibitor 1	17.24	3	45.1	427	22.4	8.5	x
TIMP2	Metalloproteinase inhibitor 2	15.59	2	11.4	158	20.9	6.7	x
CLNS1A	methylosome subunit pICln	5.51	1	4.1	80	26.1	4.1	
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0	
MSN	moesin	3.36	2	5.9	80	66.5	6.3	x
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.22	2	6.6		31.6	6.2	
MYL6	Myosin light polypeptide 6	19.08	2	7.8	62	17.3	4.6	x
MTPN	myotrophin	17.53	1	4.1	57	10.4	6.5	
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 1	21.68	3	16.3	237	37.2	7.5	x
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	14.98	4	15.9	142	34.2	6.9	x
GNS	N-acetylglucosamine-6-sulfatase	6.75	3	8.9		53.7	6.9	x
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.23	2	12.6	175	47.5	7.5	
NACA	nascent polypeptide-associated complex subunit alpha	13.49	2	9.8	143	23.4	4.6	x
NEO1	Neogenin	1.94	2	6.0	57	113.1	7.1	x
NCAM1	Neural cell adhesion molecule 1	9.09	2	6.7	64	30.2	5.2	
NRP1	neuropilin-1	1.41	1	3.3	56	103.0	5.9	
GANAB	neutral alpha-glucosidase AB isoform 2	3.18	2	7.5		106.9	6.0	x
NHP2L1	NHP2 protein 1	16.44	1	2.9	62	8.0	7.9	
NID1	Nidogen-1	40.32	34	284.9	2709	136.1	5.1	x
Nid1	nidogen-1, partial	61.41	12	170.2	1070	54.6	6.4	x

NONO	non-POU domain-containing octamer-binding protein	6.10	2	5.7	51	48.9	8.0	x
NSFL1C	NSFL1 cofactor p47 isoform 2	7.57	2	8.3	82	40.7	5.1	x
SGSH	N-sulphoglucosamine sulphohydrolase	6.18	2	7.0	89	56.5	6.5	x
NASP	nuclear autoantigenic sperm protein	1.30	1	2.8		83.4	4.4	
NUDC	Nuclear migration protein nudC	9.22	2	7.2		32.8	6.0	x
YBX1	Nuclease-sensitive element-binding protein 1	16.90	2	9.0	153	32.7	10.1	x
NUCB1	Nucleobindin-1	40.25	10	50.2	427	38.2	5.7	x
NUCB2	nucleobindin-2	31.43	13	58.5	490	50.3	5.1	x
NCL	Nucleolin	5.85	3	7.9	47	52.4	4.5	x
NPM1	Nucleophosmin	8.21	2	6.0	78	31.0	4.7	x
NME1	nucleoside diphosphate kinase A isoform 1	21.05	2	8.2		17.2	6.3	x
NME2	nucleoside diphosphate kinase B	28.29	2	10.9	137	17.3	8.0	x
NAP1L4	Nucleosome assembly protein 1 4	11.01	2	11.4	78	39.4	4.7	x
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8	
OLFML3	Olfactomedin protein 3	18.47	7	28.9	195	45.9	6.2	x
OSTF1	osteoclast-stimulating factor 1-like	5.61	1	3.4	52	23.7	5.7	
OAF	Out at first protein homolog	35.92	6	37.8	230	23.8	8.0	x
PPT1	palmitoyl-protein thioesterase 1	7.84	2	2.5	44	34.5	7.9	x
VNN1	Pantetheinase	5.27	2	7.4	131	56.7	5.5	
PDLIM1	PDZ and LIM domain protein 1	3.65	1	3.2		35.9	7.1	
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	7.29	4	11.0	100	94.7	6.5	x
PPIA	Peptidyl-prolyl cis-trans isomerase	25.61	4	13.0	180	17.9	8.3	x
PPIB	peptidyl-prolyl cis-trans isomerase B	37.04	8	42.7	441	23.6	9.6	x
PPIC	Peptidyl-prolyl cis-trans isomerase C	19.38	2	8.1	95	17.5	6.4	x
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	28.70	2	9.7	88	11.9	8.7	
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3, partial	15.43	2	6.7		21.1	9.3	x
PLIN4	perilipin-4-like	11.52	2	7.9	46	184.1	8.4	x
PXDN	peroxidasin homolog	14.85	17	79.3	766	165.3	7.0	x
PRDX1	Peroxiredoxin-1	47.24	10	59.5	462	22.2	7.7	x
PRDX4	peroxiredoxin-4	8.50	2	13.7	144	38.8	8.4	x
PRDX6	peroxiredoxin-6, partial	12.79	2	6.6	70	24.5	6.8	x
PEBP1	Phosphatidylethanolamine-binding protein 1	16.58	2	4.0	87	20.9	7.1	x
PGM1	Phosphoglucomutase-1	2.23	1	3.6	84	58.5	5.6	
PGM2	phosphoglucomutase-2	2.10	1	3.4	80	69.0	6.3	
PGK1	phosphoglycerate kinase 1	5.28	2	5.8	41	44.5	7.9	x
PGAM1	Phosphoglycerate mutase 1	14.61	2	3.4	95	20.2	8.1	x
PLTP	Phospholipid transfer protein	10.89	4		210	50.6	6.0	x

SERPINF1	Pigment epithelium-derived factor	22.73	6	19.0	192	46.4	6.9	x
PIR	pirin	7.59	2	10.6	108	32.1	6.5	x
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2	9.5	69	44.1	10.3	x
PLS3	plastin-3	5.24	3	10.6	129	70.8	5.7	x
PLA2G7	Platelet-activating factor acetylhydrolase	9.62	2	10.0	105	38.2	8.7	x
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3	
PLEC	plectin	0.60	2	6.0		533.6	5.9	
PCBP2	poly(rC)-binding protein 2 isoform 4	9.63	2	8.3	65	33.9	8.2	x
PABPC1	Polyadenylate-binding protein 1	5.84	2	6.3	40	62.7	9.6	x
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	3.3	59	23.2	8.8	
N/A	polyubiquitin	32.81	2	4.8		42.9	7.6	x
PFDN1	prefoldin subunit 1-like	9.02	1	3.4	60	14.2	6.8	
PFDN2	Prefoldin subunit 2	11.69	1		45	8.4	8.2	
TSR2	Pre-rRNA-processing protein TSR2	13.45	1	4.9	66	13.2	4.4	
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	6.4	63	69.2	8.9	x
CTSH	pro-cathepsin H	7.81	2	6.3	51	37.4	8.5	x
PCOLCE	procollagen C-endopeptidase enhancer 1	24.15	7	43.7	326	50.4	7.9	x
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	7.15	4	15.9	139	83.7	6.6	
PFN1	Profilin-1	20.00	2	6.9		14.9	8.3	x
PFN2	profilin-2	13.92	2	6.2	76	17.3	7.1	
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5	
PA2G4	Proliferation-associated protein 2G4	7.55	2	6.8		41.1	8.0	x
PROSC	Proline synthetase co-transcribed bacterial-like protein	7.62	1	3.2		24.8	6.4	
PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6	
PTGR1	prostaglandin reductase 1	10.94	2	7.2	60	35.7	7.2	x
PSME1	Proteasome activator complex subunit 1	12.56	2	7.0	66	24.5	5.4	x
PSME2	proteasome activator complex subunit 2 isoform 2	17.83	3	18.4	213	26.2	5.2	x
PSMA1	proteasome subunit alpha type-1	10.27	2	6.2	47	29.5	6.5	x
PSMA2	proteasome subunit alpha type-2	32.48	5	20.1	99	25.9	7.4	x
PSMA3	proteasome subunit alpha type-3	10.20	2	7.8	109	28.4	5.3	x
PSMA5	proteasome subunit alpha type-5	12.86	2	10.3	72	26.4	4.8	x
PSMA6	proteasome subunit alpha type-6, partial	5.91	1	4.3	74	24.4	6.6	
PSMA7	Proteasome subunit alpha type-7	11.79	2	7.8	86	23.8	8.5	x
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0	
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5	
PSMB5	proteasome subunit beta type-5	3.80	1	3.2	42	28.7	7.0	
PSMB6	proteasome subunit beta type-6	8.97	2	6.5	77	24.7	5.1	x

PSMB8	Proteasome subunit beta type-8	4.39	1	2.9		25.5	7.1	
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.52	2	5.2	57	40.5	5.6	x
CNPY2	Protein canopy-like 2	16.49	1	3.8	59	11.0	4.8	
CREG1	protein CREG1	9.55	1	3.8		24.1	8.0	
Ctla2b	protein CTLA-2-beta	34.00	2	9.2	91	11.8	5.1	x
CYR61	Protein CYR61	6.50	2	6.9	60	39.1	8.1	x
P4hb	Protein disulfide-isomerase	11.96	2	6.4	74	21.1	4.6	x
PDIA3	Protein disulfide-isomerase A3	5.41	2	9.5	83	50.0	5.7	x
PDIA4	Protein disulfide-isomerase A4	4.83	2	7.2	75	72.5	5.2	x
PDIA6	Protein disulfide-isomerase A6	10.04	2	6.6	77	28.4	4.9	x
PARK7	protein DJ-1	22.22	2	9.9	92	19.9	6.8	x
FAM3C	protein FAM3C	31.72	5	26.5	301	24.7	8.3	x
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3	
S100A11	protein S100-A11	27.00	2	9.6	66	11.2	7.1	
S100A13	Protein S100-A13	23.47	2	7.3	95	11.2	5.3	x
S100A6	protein S100-A6	19.10	2	8.4	77	10.0	5.5	x
SET	Protein SET	14.53	2	10.7	103	33.3	4.3	x
SHISA5	protein shisa-5	12.81	2	8.1		25.9	6.5	
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0	
PNP	Purine nucleoside phosphorylase	7.42	2	10.2	100	31.4	6.7	x
D1Pas1	putative ATP-dependent RNA helicase Pl10-like	2.29	1	3.6	47	58.1	7.1	
PLBD2	putative phospholipase B 2	31.97	11	83.6	635	65.5	6.3	x
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1	
PDXK	Pyridoxal kinase	11.11	1	3.1	67	9.6	10.7	
PKM	pyruvate kinase isozymes M1/M2 isoform 1	14.31	6	20.6	178	57.9	7.3	x
GDI2	rab GDP dissociation inhibitor beta	6.74	2	7.7	82	50.5	6.3	x
RDX	radixin	13.04	3	28.2	197	68.5	6.3	
RANBP1	Ran-specific GTPase-activating protein	11.34	2	6.3		22.6	5.2	x
IQGAP1	Ras GTPase-activating protein IQGAP1	1.29	2	6.3	40	185.6	6.7	x
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.9	60	50.4	5.6	
YPT1	Ras GTP-binding protein YPT1	22.92	2	6.6	80	10.9	5.1	x
RAB11A	ras-related protein Rab-11A isoform 1	9.26	2	5.0		24.4	6.6	x
RAB7A	ras-related protein Rab-7a	14.98	3	7.8	53	23.5	6.7	x
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.9		20.8	5.8	
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2.92	2	10.2	100	90.9	4.7	
ATP6AP2	Renin receptor	12.00	3	8.7		33.8	5.2	
RARRES2	Retinoic acid receptor responder protein 2	27.08	2	3.6	47	16.4	9.1	x

SCPEP1	Retinoid-inducible serine carboxypeptidase	9.96	3	16.7	190	50.9	5.7	x
ARHGDIA	Rho GDP-dissociation inhibitor 1	15.20	2	6.6		23.4	5.3	x
RNASE4	ribonuclease 4	36.05	3	16.0	44	17.0	9.3	
RNH1	ribonuclease inhibitor	4.82	2	6.0	69	50.0	4.8	x
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7	
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7	
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3	
FUS	RNA-binding protein FUS	12.20	2	10.3	75	21.2	10.0	x
SEMA3C	Semaphorin-3C	2.80	2	7.2	78	85.2	8.7	x
SEMA4B	Semaphorin-4B	4.33	2	6.1		49.0	7.2	
SEPT11	septin-11-like	4.47	1	5.2	43	49.0	7.0	
SEPT9	septin-9	1.77	1	6.4	65	63.7	8.3	
HTRA1	Serine protease HTRA1	41.67	8	35.6	398	34.1	7.2	x
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	5.76	2	5.8	40	37.5	6.3	x
SERPINB6	serpin B6 isoform 1	5.29	2	6.9	83	43.1	5.9	x
SERPINH1	Serpin H1	5.76	2	7.4	63	46.5	8.7	x
ESD	S-formylglutathione hydrolase	13.23	2	8.9	60	28.2	6.5	x
SH2D3C	SH2 domain-containing protein 3C	1.10	1	2.3		90.7	8.5	
SH3BGRL2	SH3 domain-binding glutamic acid-rich protein	20.18	2	6.2	85	12.7	5.1	x
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	13.89	1		55	8.0	6.6	
SIAE	sialate O-acetylesterase	11.45	5	18.7	202	61.4	8.2	x
NEU1	Sialidase-1	6.91	2	7.8	96	36.4	5.5	x
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3	
SGTA	small glutamine-rich tetratricopeptide repeat-containing protein alpha-like	2.87	1	2.9		34.1	5.0	
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.8	9.0	
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5	
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	7.7	65	31.0	7.1	
CANT1	soluble calcium-activated nucleotidase 1	5.75	2	7.1	103	45.2	6.6	x
SPARC	SPARC	25.08	5	32.5	276	34.9	4.8	x
SPTAN1	Spectrin alpha chain, brain	1.51	3	10.9	61	258.7	5.4	x
SMPD1	Sphingomyelin phosphodiesterase	6.41	2	7.4	126	66.2	7.0	x
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7	
SFPQ	splicing factor, proline- and glutamine-rich	5.31	2	3.1	57	49.4	7.9	x
STIP1	Stress-induced-phosphoprotein 1	6.81	3	10.7	43	62.6	6.8	x
Psap	Sulfated glycoprotein 1	17.84	9	67.6	596	58.2	5.5	x

QSOX1	Sulfhydryl oxidase 1	12.02	6	30.8	267	70.3	7.9	x
SOD1	superoxide dismutase	14.88	2	11.5	85	25.9	9.6	
SBSN	suprabasin	29.00	10	49.1	531	63.3	7.4	x
VAT1	Synaptic vesicle membrane protein VAT-1	15.06	3	11.2	113	28.5	7.6	x
SDC4	syndecan-4	18.81	3	21.6	114	22.2	4.6	
TCP1	T-complex protein 1 subunit alpha	5.58	2	9.9	141	60.3	6.0	x
CCT2	T-complex protein 1 subunit beta	4.30	2	5.9	48	57.5	6.5	x
CCT4	T-complex protein 1 subunit delta	6.05	2	6.6	51	42.1	8.3	x
CCT5	T-complex protein 1 subunit epsilon isoform 1	4.99	2	10.3	143	59.5	5.5	x
CCT7	T-complex protein 1 subunit eta	4.21	2	5.9	68	54.9	7.4	x
CCT3	T-complex protein 1 subunit gamma	3.85	2	5.5	41	60.6	6.6	x
CCT8	T-complex protein 1 subunit theta	9.57	2	6.7	92	24.8	5.3	x
CCT6A	T-complex protein 1 subunit zeta	4.90	2	5.4		57.9	6.9	x
TXN	thioredoxin	28.92	2	7.9	68	9.1	4.7	x
TXNRD1	thioredoxin reductase 1	5.81	2	6.1	64	54.7	6.8	x
THBS1	thrombospondin-1	10.94	9	28.9	226	129.6	4.9	x
THBS3	Thrombospondin-3	4.09	2	5.9	54	61.4	4.3	x
FUCA1	Tissue alpha-L-fucosidase	4.37	2	6.5	75	52.8	6.5	x
TFPI	tissue factor pathway inhibitor	3.34	2	3.2	44	34.4	8.2	x
PLAT	Tissue-type plasminogen activator	3.09	1		40	50.8	7.9	
TANK	TRAF family member-associated NF-kappa-B activator	4.45	1	15.6	97	48.7	5.3	
TALDO1	Transaldolase	17.51	6	23.5	133	37.4	6.7	x
BTF3	Transcription factor BTF3	20.71	1		47	15.4	5.6	
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3	
TAGLN2	transgelin-2	20.60	3	11.4	95	22.4	8.6	x
VCP	Transitional endoplasmic reticulum ATPase	5.83	4	14.1	119	89.3	5.3	x
TKT	transketolase	9.31	3	14.3	102	67.7	7.6	x
TPT1	Translationally-controlled tumor protein	16.20	2	6.6	70	15.9	5.0	x
GART	Trifunctional purine biosynthetic protein adenosine-3	0.89	1	2.7		107.5	6.8	
TPI1	Triosephosphate isomerase	26.67	2	13.9	130	16.4	8.2	x
TPP1	Tripeptidyl-peptidase 1	35.70	12	93.4	880	61.5	6.5	x
TPM3	tropomyosin alpha-3 chain isoform 2	10.93	2	8.6	129	28.8	4.8	x
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	56	14.4	4.8	
TUBA1C	tubulin alpha-1C chain	8.69	3	11.0	105	49.9	5.1	x
TUBB2B	tubulin beta-2B chain	29.57	3	40.9	347	49.6	4.9	x
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0	
TUBB4B	tubulin beta-4B chain	19.03	2	15.5	191	41.8	4.9	x

TTLL12	tubulin--tyrosine ligase-like protein 12	1.56	1	2.6		74.1	5.6	
TINAG	tubulointerstitial nephritis antigen	13.55	4	23.4	167	52.5	7.1	x
TNFSF9	tumor necrosis factor ligand superfamily member 9	8.47	2	7.7	77	33.6	6.2	
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3	
SNRPA1	U2 small nuclear ribonucleoprotein A'	12.63	1	2.3		10.0	8.5	
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.80	1	2.9	52	158.1	6.0	
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1	
UBA1	ubiquitin modifier-activating enzyme 1	2.93	2	7.0		117.6	5.7	x
UBE2N	Ubiquitin-conjugating enzyme E2 N	20.39	2	8.0	68	17.1	6.6	x
UGDH	UDP-glucose 6-dehydrogenase, partial	8.52	2	6.6	74	29.4	7.6	x
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1	
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3	
RAD23B	UV excision repair protein RAD23 homolog B	6.94	3	8.2	71	43.7	4.9	x
VPS35	Vacuolar protein sorting-associated protein 35	0.88	1	2.3		91.6	5.4	
VASN	vasorin	13.52	5	32.6	275	72.5	7.5	
VIM	vimentin	15.26	6	19.1	138	44.5	4.8	x
VCL	vinculin isoform 1	2.16	2	6.5		116.6	6.0	x
PROS1	Vitamin K-dependent protein S	6.68	4	14.2	145	74.6	5.7	x
ATP6AP1	V-type proton ATPase subunit S1	15.42	5	22.6	179	48.9	6.0	x
WDR1	WD repeat-containing protein 1	5.21	3	8.3	52	58.8	7.1	x

Table 3.3.51: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line at 31˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
ADPRH	[Protein ADP-ribosylarginine] hydrolase	3.71	1	4.1	67	38.8	6.3
RPS11	40S ribosomal protein S11	12.03	2	6.0	40	18.3	10.0
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8
RPL21	60S ribosomal protein L21	8.66	1	2.5		14.7	11.7
RPL8	60S ribosomal protein L8	8.33	1	2.6		14.1	10.6
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
ACTB	actin, cytoplasmic 1	45.33	5	60.7	531	41.7	5.4
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	8.0	91	14.4	9.6
ARF1	ADP-ribosylation factor 1	18.23	2	8.6	104	20.7	6.3
ARF1	ADP-ribosylation factor 1, partial	23.08	1	4.1	89	7.3	5.3
AGRN	agrin isoform 1	1.33	2	8.3	97	217.0	5.8
ADH5	alcohol dehydrogenase class-3	6.68	2	6.5		39.6	7.7
MAN2A1	Alpha-mannosidase 2	4.13	2	8.3	92	78.3	8.0
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6
AIMP2	aminoacyl tRNA synthase complex-interacting multifunctional protein 2	7.81	1	5.0		35.4	7.8
ANKS3	ankyrin repeat and SAM domain-containing protein 3	1.68	1	2.3		72.3	5.3
ARAP2	arf-GAP with Rho-GAP domain, ANK repeat and PH domain-containing protein 2, partial	0.47	1	2.7		169.7	7.3
AKNA	AT-hook-containing transcription factor	1.27	1	2.5		137.0	6.0
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
BANF1	barrier-to-autointegration factor	13.48	1	2.7		10.1	6.1
BSG	Basigin	4.02	1	2.6		27.4	5.9
B4GALT1	Beta-1,4-galactosyltransferase 1	7.05	2	2.6	65	26.5	8.8
B2M	beta-2-microglobulin precursor	27.73	3	53.8	328	13.8	7.4
CNN2	Calponin-2	5.69	1	3.1		32.5	7.0
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
ALCAM	CD166 antigen	4.29	2	6.0	75	65.0	6.3

CD63	CD63 antigen	4.31	1	3.0	43	25.5	7.6
CHMP4B	Charged multivesicular body protein 4b	5.26	1	3.1		21.4	4.7
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	11.18	3	12.5	118	38.9	9.4
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
CORO1C	coronin-1C	1.69	1	2.2		53.1	7.1
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	2.89	1	3.1	54	43.1	10.4
CRELD2	cysteine-rich with EGF domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1
DLG5	disks large homolog 5	2.56	1	2.3		27.8	6.9
APEX1	DNA-(apurinic or apyrimidinic site) lyase	3.47	1	2.9		35.5	8.4
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1
EIF1B	Eukaryotic translation initiation factor 1b	12.39	1	3.9	81	12.8	7.4
EIF3G	eukaryotic translation initiation factor 3 subunit G	4.06	1	3.0		35.7	5.9
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7
EXT2	Exostosin 2	9.49	2	7.9	94	35.7	8.6
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
FSIP2	Fibrous sheath-interacting protein 2	0.17	1	2.5		656.4	6.1
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
LGALS3	galectin-3	8.05	2	6.1	42	27.2	8.9
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
NMT2	Glycylpeptide N-tetradecanoyltransferase 2	8.48	1	5.5	72	19.0	5.7
GRN	granulins isoform 2	4.90	2	9.3	51	63.9	6.4
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0
HSPH1	Heat shock protein 105 kDa	1.29	1	5.0		87.9	5.8
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
HDGF	Hepatoma-derived growth factor	10.05	1	5.3		20.9	4.5
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	8.17	2	6.0		45.8	5.6
H2AFX	Histone H2A.x	27.27	2	25.0	120	15.1	10.9
HIST3H3	Histone H3.1t	9.69	1	6.4	167	35.8	10.7
N/A	hypothetical protein I79_017197	15.79	1	2.4		8.4	7.1

N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
IPO4	importin-4	1.02	1	2.2		118.5	5.0
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5
IAH1	isoamyl acetate-hydrolyzing esterase 1 homolog	6.02	1	3.4		27.8	5.7
KRT5	keratin, type II cytoskeletal 5	1.80	1	2.4		54.4	5.4
KRT8	keratin, type II cytoskeletal 8	4.10	1	6.2	72	54.3	5.8
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9
ACP1	low molecular weight phosphotyrosine protein phosphatase	7.69	1	4.0	63	18.0	7.7
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
MANF	Mesencephalic astrocyte-derived neurotrophic factor	7.82	1	3.9		20.4	8.3
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
MAP6	microtubule-associated protein 6, partial	7.56	1	2.3		50.2	9.2
eb1	microtubule-associated protein RP/EB family member 1	7.46	1		43	30.0	5.2
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1
Nlrp9a	NACHT, LRR and PYD domains-containing protein 9A	2.29	1	2.7		59.4	6.1
NPPB	natriuretic peptides B	31.40	3	27.3	196	13.4	10.1
NBL1	neuroblastoma suppressor of tumorigenicity 1	3.93	1	2.0		19.1	5.0
NPTN	neuroplastin	2.68	1	2.5		42.4	8.2
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
OLA1	Obg ATPase 1	5.17	1	10.4	174	31.9	8.5
PTHLH	Parathyroid hormone-related protein	5.24	1	2.6	42	22.0	10.6
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
PAFAH1B2	platelet-activating factor acetylhydrolase IB subunit beta, partial	6.77	1	2.9	63	14.5	6.4
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	3.95	1	2.9	54	25.5	8.6
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9
KCNH4	potassium voltage-gated channel subfamily H member 4	1.51	1	2.6		115.7	8.8
PFDN6	prefoldin subunit 6	7.87	1	2.6		14.4	8.9
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0
PRMT5	Protein arginine N-methyltransferase 5	1.73	1	3.6	41	66.3	5.7
TPST1	protein-tyrosine sulfotransferase 1	3.29	1	3.4	47	41.4	9.3
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3

RAB39A	Ras-related protein Rab-39A	12.64	1	3.2	48	10.2	9.5
RPA1	Replication protein A 70 kDa DNA-binding subunit	3.39	2	6.1	47	68.5	7.9
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9
RHOC	rho-related GTP-binding protein RhoC precursor	8.81	1	4.0		22.0	6.6
STK38	Serine/threonine-protein kinase 38	7.69	1	2.2		15.0	5.4
PPP2R2A	serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	2.41	1	3.9	56	52.9	6.5
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	3.28	1	2.8	49	46.0	7.6
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1
SNRPE	small nuclear ribonucleoprotein E	11.96	1	2.6	60	10.8	8.7
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9
SNRPD2	Small nuclear ribonucleoprotein Sm D2	25.42	3	13.0		13.5	9.8
SORD	sorbitol dehydrogenase	2.24	1	2.8		38.3	7.7
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
U2AF2	Splicing factor U2AF 65 kDa subunit	3.79	1	3.5	42	45.7	4.9
STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
SULT1C2	sulfotransferase 1C2	4.01	1	2.2		35.3	8.3
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
ALYREF	THO complex subunit 4	7.01	1	3.4		16.8	10.1
TOR1B	Torsin-1B	14.19	2	5.9		17.2	7.3
TCEB2	Transcription elongation factor B polypeptide 2	6.78	1	2.3		13.1	5.0
TSN	Translin	3.54	1	2.7	60	25.9	8.0
TRAIP	TRIP protein	1.69	1	2.9	50	77.1	4.8
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8
TPM2	Tropomyosin beta chain	8.68	2	7.3	71	30.7	4.8
TNFRSF21	Tumor necrosis factor receptor superfamily member 21	4.60	2	7.7		71.3	7.5
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0
N/A	ubc2e ubiquitin conjugating enzyme, isoform CRA_b	10.00	1	2.9		12.6	8.3
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2, partial	13.10	2	8.2	52	15.4	4.9
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1
C11orf68	UPF0696 protein C11orf68 homolog	4.38	1	2.7		27.5	5.5
VEGFA	Vascular endothelial growth factor A	17.57	2		62	17.3	9.5

VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	3.4	85	26.8	7.8
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
ZNF829	zinc finger protein 829	1.48	1	3.6	77	70.3	8.5
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
RPS15	40S ribosomal protein S15-like	16.96	1	4.5	80	13.0	10.9
RPL10A	60S ribosomal protein L10a-like	6.19	1	4.9	83	23.4	9.9
RPL31	60S ribosomal protein L31-like, partial	11.29	1	4.4	59	14.3	9.3
AP1B1	AP-1 complex subunit beta-1-like	1.21	1	2.5		99.6	5.0
AIFM1	apoptosis-inducing factor 1, mitochondrial-like	2.45	1	3.0		66.7	9.0
SAT2	diamine acetyltransferase 2-like	4.14	1		47	19.4	7.4
N/A	DNA-binding protein A-like	10.03	1	9.3	122	39.9	10.1
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	18.03	1	3.0	50	7.2	9.1
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4
GSTT2	glutathione S-transferase theta-2-like	5.74	1	3.1		27.8	7.2
Large	glycosyltransferase-like protein LARGE1	2.51	1	2.9		88.0	7.7
GNG2	guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2-like	10.00	1		41	7.6	7.9
H2-D1	h-2 class I histocompatibility antigen, D-B alpha chain-like, partial	6.67	1	3.2	54	21.4	9.2
HEBP1	heme-binding protein 1-like	8.42	1		40	21.2	5.3
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
KRT26	keratin, type I cytoskeletal 26-like, partial	5.20	1	2.2		18.5	7.0
LXN	latexin-like	5.41	1	3.8	83	25.4	6.1
MRGPRG	mas-related G-protein coupled receptor member G-like	5.52	1	5.1		32.3	8.6
NUDCD2	nudC domain-containing protein 2-like	5.73	1	2.3		17.7	5.1
PMM2	phosphomannomutase 2-like	4.55	1	2.4		27.7	6.7
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
PSMB2	proteasome subunit beta type-2-like	4.98	1	3.0	60	22.8	7.9
FNTB	protein farnesyltransferase subunit beta-like, partial	3.44	1	2.3		55.2	6.1
PCMT1	protein-L-isoaspartate(D-aspartate) O-methyltransferase-like	5.95	1	3.0	52	20.1	8.6
IQGAP2	Ras GTPase-activating-like protein IQGAP2	0.58	1	2.3		177.8	5.6
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
FBLL1	rRNA/tRNA 2'-O-methyltransferase fibrillarin-like protein 1	14.29	1	3.9		10.8	6.8
PPP1CB	serine/threonine-protein phosphatase PP1-beta catalytic subunit-like	3.04	1	3.1	41	37.3	7.5

SMAP	small acidic protein-like	9.34	1	4.6	44	20.1	4.8
SPIN4	spindlin-4-like	4.02	1	2.4		28.5	8.1
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
TES	testin-like isoform 1	2.96	1		51	46.1	7.5
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TXNL1	Thioredoxin-like protein 1	5.82	1	2.9		20.8	4.9
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
TFAP4	transcription factor AP-4-like	3.25	1	2.4		38.7	6.1
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4
C14orf166	UPF0568 protein C14orf166-like	8.18	1	2.7	42	12.3	6.9
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9

Table 3.3.52: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line at 31˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	2.26	2	6.3	78	109.4	5.0
PSMC1	26S protease regulatory subunit 4	2.73	1	5.9	88	49.2	6.2
PSMC2	26S protease regulatory subunit 7	5.17	2	6.7	45	52.0	5.8
PPID	40 kDa peptidyl-prolyl cis-trans isomerase	4.09	1	2.2		24.0	6.0
RPS23	40S ribosomal protein S23	7.75	1	3.2	56	15.9	9.9
RPS3A	40S ribosomal protein S3a, partial	16.83	2	4.7	51	11.4	9.9
RPS4X	40S ribosomal protein S4, X isoform	3.44	1	2.6	47	29.2	10.3
RPL13A	60S ribosomal protein L13a	9.40	1	2.7	54	13.6	10.6
RPL14	60S ribosomal protein L14	4.49	1	3.1	61	29.5	11.0
RPL17	60S ribosomal protein L17	5.05	1	2.6	46	23.0	10.2
RPL4	60S ribosomal protein L4	2.84	1	2.8	49	47.5	11.0
RPL7	60S ribosomal protein L7	12.94	1	3.5	64	10.0	10.0
RPL7A	60S ribosomal protein L7a	20.00	2	6.8	62	15.6	11.4
PFKL	6-phosphofructokinase, liver type	1.15	1	2.5		85.3	7.5
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	2	5.7	76	28.5	4.1
ACTA1	actin, alpha skeletal muscle A	12.64	1	50.9	243	9.7	8.5
ACTG1	Actin, cytoplasmic 2	45.48	15	82.0	755	41.8	5.5
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
ACTR3B	Actin-related protein 3B	3.03	1	2.7	49	41.7	6.6
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
App	Alzheimer's amyloid beta protein precursor	17.72	1	12.4	529	8.5	7.4
AIMP1	Aminoacyl tRNA synthase complex-interacting multifunctional protein 1	5.61	1	4.6	54	35.2	8.8
ANXA6	annexin A6 isoform 2	1.63	1	5.2	42	76.1	5.6
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
APOA1	Apolipoprotein A-I-binding protein	5.22	1	2.8		25.4	5.4
RARS	Arginyl-tRNA synthetase, cytoplasmic	1.66	1	3.5	43	75.5	7.1
ATXN10	Ataxin-10	3.16	1	2.8	69	53.8	5.2
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
ACTR1B	beta-centractin	2.66	1	3.2		42.2	6.7
BAZ2B	Bromodomain adjacent to zinc finger domain protein 2B	0.54	1	2.3		205.6	6.1
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3

CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
CPD	Carboxypeptidase D	0.90	1	2.8	59	123.4	6.2
CRTAP	Cartilage-associated protein	3.07	1	2.8		30.8	4.9
CSNK2A1	Casein kinase II subunit alpha	3.84	1	3.8		45.1	7.7
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
CD81	CD81 antigen isoform 1	8.47	1	4.1	74	25.8	5.5
P21926	CD9 antigen	6.29	1	3.1		17.7	6.7
CHD6	Chromodomain-helicase-DNA-binding protein 6	1.72	1	2.3		74.8	5.7
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
C1QTNF5	complement C1q tumor necrosis factor-related protein 5	5.35	1	2.4		25.3	6.4
CFH	complement factor H, partial	2.43	1		50	69.5	6.8
ABRACL	costars family protein C6orf115 homolog	11.11	1	2.6		9.0	5.8
Q9UEE9	Craniofacial development protein 1	3.38	1	3.0	43	33.0	4.8
ATF4	Cyclic AMP-dependent transcription factor ATF-4	2.30	1	2.3		38.2	4.9
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
DPP3	dipeptidyl peptidase 3	7.05	3	12.5	119	82.9	5.2
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	110	102.1	5.6
MCM3	DNA replication licensing factor MCM3	2.11	1	3.8		90.7	5.5
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4
DBN1	Drebrin	2.83	1		55	69.5	4.4
EFHD2	EF-hand domain-containing protein D2	20.86	2	7.7	84	15.9	5.3
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0
ELAVL1	ELAV protein 1	3.88	1	3.5	72	37.1	9.2
EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
EDF1	Endothelial differentiation-related factor 1	14.15	1	12.1	70	11.7	10.0
ETF1	eukaryotic peptide chain release factor subunit 1	3.22	1	3.4	54	45.4	5.5
EIF2S2	Eukaryotic translation initiation factor 2 subunit 2	3.00	1	2.4		38.2	5.8
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
SSRP1	FACT complex subunit SSRP1 isoform 1	1.55	1	2.5		81.0	6.9
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FNDC8	fibronectin type III domain-containing protein 8	3.11	1	4.6		35.9	6.3

FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
FLNB	filamin-B isoform 3	0.85	2	5.4	43	275.1	5.7
TSTA3	GDP-L-fucose synthase	3.74	1	3.6	51	35.8	6.9
GSN	gelsolin	1.98	1	3.8		72.0	6.3
N/A	glutamate	1.11	1	2.4		137.1	8.6
N/A	Glutaminyl-tRNA synthetase	1.29	1	2.4	49	87.7	7.2
GLRX3	glutaredoxin-3	3.83	1	2.4		32.5	5.7
GPX1	Glutathione peroxidase 1	8.96	1		45	22.3	7.2
Gsta5	Glutathione S-transferase alpha-5	7.03	1	2.5		14.5	6.8
GSTM2	glutathione S-transferase Mu 2	22.00	0	9.5	106	23.6	5.1
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4
GAPDH	glyceraldehyde-3-phosphate dehydrogenase, partial	32.70	1	7.5	224	33.8	8.5
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
GLIPR2	Golgi-associated plant pathogenesis-related protein 1	8.67	1	3.4	58	16.7	9.2
GPR56	G-protein coupled receptor 56	3.20	2	32.4	290	77.3	8.8
GNAL	Guanine nucleotide-binding protein G(olf) subunit alpha	6.75	1	3.1	60	18.6	7.9
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	14.69	3	2.3	83	34.1	9.2
HNRNPM	Heterogeneous nuclear ribonucleoprotein M	3.33	1		43	73.7	8.7
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
Hist3h2ba	histone H2B type 3-A	11.90	1	15.2	304	14.0	10.4
HAPLN1	hyaluronan and proteoglycan link protein 1	2.54	1	2.2		40.3	7.8
HMGCS2	hydroxymethylglutaryl-CoA synthase, mitochondrial	2.17	1	3.4	54	57.2	8.6
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
IPO7	importin-7	0.87	1	2.4		119.4	4.8
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	6.03	2	10.4	43	55.9	7.3
ITPR3	Inositol 1,4,5-trisphosphate receptor type 3	1.67	1	2.3		95.6	6.1
ICAM1	intercellular adhesion molecule 1 precursor	2.66	1	3.5		57.6	7.2
KDELC2	KDEL motif-containing protein 2	1.99	1		41	52.4	7.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	10.43	1	17.2	234	45.9	8.1
KRT6A	Keratin, type II cytoskeletal 6A	9.19	1	17.1	181	48.5	8.0
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2
LAMA3	laminin subunit alpha-3	0.34	1	3.7	50	350.8	6.8
LTBP1	Latent-transforming growth factor beta-binding protein 1	2.01	2	3.0	57	130.0	5.1
LTA4H	leukotriene A-4 hydrolase	2.13	1	3.1	48	69.1	6.3

N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
MVP	Major vault protein	4.28	1	3.8		40.9	6.0
MAMDC2	MAM domain-containing protein 2	1.92	1	2.6	46	53.3	5.7
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
MYH9	myosin-9	0.74	1	8.3		217.6	5.6
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	3.98	1	3.3	42	38.3	5.9
PGLYRP2	N-acetylmuramoyl-L-alanine amidase	2.02	1	2.9	42	64.8	6.9
NTN4	Netrin-4	4.01	2	5.1	71	64.0	8.1
NENF	neudesin	11.29	2	2.7	45	20.4	7.8
NCEH1	neutral cholesterol ester hydrolase 1	1.94	1	3.2	54	68.3	7.8
SCP2	non-specific lipid-transfer protein	1.83	1	2.3		58.9	7.4
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	4.53	1	2.3		27.1	5.1
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
OR10X1	olfactory receptor 10X1	3.23	1	8.2		34.4	8.6
Q86UD1	Out at first protein	21.71	3	7.6		17.7	8.1
PALLD	Palladin	3.17	1	2.3		42.1	8.6
PAPLN	Papilin	2.89	2		79	127.2	7.3
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
PPIA	Peptidyl-prolyl cis-trans isomerase A	14.06	2	116.9	1144	14.1	6.8
FKBP2	peptidyl-prolyl cis-trans isomerase FKBP2 isoform 1	8.57	1	2.2		15.4	9.3
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	6.49	3	9.2		63.0	5.1
POSTN	periostin isoform 5	1.46	1	2.5		83.5	8.0
PFAS	phosphoribosylformylglycinamidine synthase	0.82	1	3.0	67	144.6	5.6
PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PSPH	phosphoserine phosphatase	7.56	2	4.8	46	25.0	5.5
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein	2.73	1	2.4		37.4	7.1
SERPINE1	Plasminogen activator inhibitor 1	3.33	1	2.7		30.7	6.2
PCBP2	Poly(rC)-binding protein 2	7.39	1	2.8		18.6	6.4
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
PABPN1	Polyadenylate-binding protein 2	5.21	1	2.9	43	23.8	9.8
PABPC4	Polyadenylate-binding protein 4	5.34	1	7.5	87	57.9	9.2
PTRF	polymerase I and transcript release factor	4.60	1	4.7	53	43.7	5.5

PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
PFDN4	Prefoldin subunit 4	11.19	1	3.6	62	15.3	4.6
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
PCOLCE2	Procollagen C-endopeptidase enhancer 2	3.02	1	3.2		40.3	9.3
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
PDCD5	programmed cell death protein 5	8.46	1	2.4	43	14.9	6.9
LRP1	prolow-density lipoprotein receptor-related protein 1	0.24	1	2.4	45	504.3	5.4
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
PSMA4	proteasome subunit alpha type-4	13.41	2	11.8	127	29.5	7.7
CDV3	protein CDV3 homolog	8.24	1	5.0	41	31.3	7.2
DBF4	Protein DBF4 A	4.19	1	4.0		40.4	5.7
TTLL8	protein monoglycylase TTLL8	1.08	1	2.4		95.4	8.5
PPP1R7	Protein phosphatase 1 regulatory subunit 7	3.05	1	3.4	60	41.6	4.9
PPM1F	Protein phosphatase 1F	11.36	1	4.6	47	19.4	4.9
RCC2	Protein RCC2	3.77	1	3.6	49	31.9	7.0
S100A10	protein S100-A10	10.31	1	3.1		11.2	6.8
TANC2	Protein TANC2	0.41	1	2.2		217.5	7.6
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
N/A	putative allantoicase	1.10	1	2.3	47	80.2	7.9
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.79	1	3.6		82.8	7.1
N/A	pyruvate kinase isozymes M1/M2 isoform 2	9.85	3	19.3	96	49.8	6.6
RSU1	ras suppressor protein 1	3.25	1	2.2		31.5	8.6
RAB5A	ras-related protein Rab-5A	5.12	1	2.6		23.5	8.1
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	4.62	2	5.6	42	55.5	8.0
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7
RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
RRBP1	ribosome-binding protein 1	0.89	1	3.4		158.2	9.0
RBM39	RNA-binding protein 39 isoform a	2.83	1	2.5	45	59.3	10.1
RUVBL1	ruvB 1	2.63	1	3.3		50.2	6.4
SALL1	Sal protein 1	0.77	1	2.2		137.3	7.0
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9
SEMA3B	semaphorin-3B	5.07	3	5.0	41	83.0	8.4
SEMA3E	semaphorin-3E	1.29	1	2.6	43	89.5	7.8
SRSF5	serine/arginine-rich splicing factor 5	3.35	1	2.8	45	30.9	11.6

PPP2R1A	serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A beta isoform isoform 1	2.00	1	2.9		65.9	5.1
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
SLITRK4	SLIT and NTRK protein 4	1.21	1	4.9		92.7	7.9
SNRPD1	small nuclear ribonucleoprotein Sm D1	16.81	1	2.4	82	13.3	11.6
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9
SNX1	sorting nexin-1 isoform 2	3.06	1	8.1	77	51.7	5.7
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
N/A	Sperm motility kinase X	5.08	1		41	22.1	6.7
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.1	40	22.3	7.9
SRSF7	Splicing factor, arginine/serine-rich 7	5.29	1	11.6	117	26.1	11.9
CTTN	src substrate cortactin isoform 1	3.87	1		48	49.0	5.1
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
ACP5	tartrate-resistant acid phosphatase type 5	3.64	1	3.6	55	37.1	8.8
TTC25	tetratricopeptide repeat protein 25	1.09	1	2.5	43	73.3	5.6
THOP1	thimet oligopeptidase	4.51	2	7.6	82	78.1	6.0
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	1.73	1	3.2	55	80.6	6.9
TRA2B	transformer-2 protein homolog beta isoform 1	5.56	1	2.9	75	33.6	11.3
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
TPM2	tropomyosin beta chain, partial	13.95	2	10.6	84	29.9	4.6
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBB2A	Tubulin beta-2 chain	26.57	3	43.4	331	46.5	5.0
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7
TWF1	Twinfilin-1	2.57	1	2.9	42	40.0	6.5
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8
UCHL5	Ubiquitin carboxyl-terminal hydrolase isozyme L5	3.50	1	2.9		35.9	5.1
UFD1L	Ubiquitin fusion degradation protein 1 homolog	4.23	1	2.3		34.5	6.7
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3
UBAP2	Ubiquitin-associated protein 2	4.36	1	3.9	55	49.3	8.7

UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	6.85	1	2.8	44	16.5	8.6
UBXN1	UBX domain-containing protein 1, partial	10.08	1	2.3		13.0	5.5
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
N/A	uncharacterized protein KIAA0586, partial	0.75	1	2.2		161.7	6.1
NSF	Vesicle-fusing ATPase	26.00	1	3.5	46	5.5	6.6
NSF	vesicle-fusing ATPase, partial	14.29	1	2.6		8.6	5.4
LMAN2	vesicular integral-membrane protein VIP36	2.25	1	2.9	53	40.2	6.9
XPNPEP1	xaa-Pro aminopeptidase 1	1.77	1	2.7		69.8	5.5
ZEB2	zinc finger E-box-binding homeobox 2	0.91	1	2.5		135.4	6.1

Table 3.3.53: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of a non-producing CHO K1 cell line at 31˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
HSPE1	10 kDa heat shock protein, mitochondrial	13.73	1	4.8	78	11.0	9.5
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0
RPLP1	60S acidic ribosomal protein P1	66.67	2	9.0	65	11.5	4.4
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8
RPL9	60S ribosomal protein L9	15.10	2	7.1	83	21.9	9.9
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	2.60	2	6.7	71	104.8	7.8
ANP32B	acidic leucine-rich nuclear phosphoprotein 32 family member B	9.92	3	8.7		29.7	4.0
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.47	3	12.1	59	24.1	3.9
ACTB	actin, cytoplasmic 1	45.33	5	60.7	531	41.7	5.4
SUB1	activated RNA polymerase II transcriptional coactivator p15	22.83	2	8.0	91	14.4	9.6
ADM	ADM	22.28	2	9.8	82	20.6	10.2
AGRN	agrin isoform 1	1.33	2	8.3	97	217.0	5.8
ADH5	alcohol dehydrogenase class-3	6.68	2	6.5		39.6	7.7
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1
GLA	Alpha-galactosidase A	13.49	3	11.6	86	38.5	5.0
ABP1	amiloride-sensitive amine oxidase	7.98	5	18.0	152	79.8	6.6
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0
NPPA	Atrial natriuretic factor	10.22	3	54.9	389	40.3	7.5
B2M	beta-2-microglobulin precursor	27.73	3	53.8	328	13.8	7.4
HEXA	beta-hexosaminidase subunit alpha	5.87	2	7.9	73	60.6	6.5
CBR1	carbonyl reductase 1	22.74	4	15.2	135	30.5	7.7
IGF2R	Cation-independent mannose-6-phosphate receptor	1.64	2	5.6		154.2	5.5
ALCAM	CD166 antigen	4.29	2	6.0	75	65.0	6.3
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	11.18	3	12.5	118	38.9	9.4
COL5A1	Collagen alpha-1(V) chain	7.41	2		75	42.2	4.4
COL5A1	collagen alpha-1(V) chain, partial	4.80	3	9.9	79	103.3	5.9
CAND1	cullin-associated NEDD8-dissociated protein 1	1.91	2	7.6	121	133.5	5.7
CXCL3	C-X-C motif chemokine 3 precursor	22.77	2	13.7	89	11.0	8.8
CSTB	cystatin-B	33.67	2	11.1	43	11.2	7.4

CSRP1	cysteine and glycine-rich protein 1	12.95	2	6.1	45	20.5	8.6
CRIP2	cysteine-rich protein 2	10.10	2	6.5	56	22.7	8.6
DPT	dermatopontin	9.45	2	5.8	48	24.0	4.9
DSTN	destrin	12.12	2	5.6	64	18.6	7.7
DHFR	dihydrofolate reductase (EC 1.5.1.3)	12.30	2	3.2	81	21.6	8.0
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	3.13	2	7.4		106.2	7.5
EML2	Echinoderm microtubule-associated protein 2	6.62	2	5.1		32.7	6.1
EEF1B2	elongation factor 1-beta	12.44	2	9.7	142	24.7	4.7
NPC2	epididymal secretory protein E1	14.09	2	8.7		16.5	8.0
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.4
EIF3G	eukaryotic translation initiation factor 3 subunit G	4.06	1	3.0		35.7	5.9
EIF3J	Eukaryotic translation initiation factor 3 subunit J	9.72	2	7.5		24.7	4.7
EXT2	Exostosin 2	9.49	2	7.9	94	35.7	8.6
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6
CSE1L	exportin-2	2.47	2	7.3	60	110.3	5.8
SULF2	extracellular sulfatase Sulf-2	2.86	2	7.2		100.5	9.1
CAPZA1	F-actin-capping protein subunit alpha-1	9.32	2	7.9	105	32.1	6.8
BLVRB	Flavin reductase	45.83	2	10.3	67	8.1	8.3
FAH	fumarylacetoacetase, partial	10.53	3	4.9	49	40.1	6.7
LGALS3	galectin-3	8.05	2	6.1	42	27.2	8.9
G6PD	Glucose-6-phosphate 1-dehydrogenase	15.24	2	5.2	67	18.8	6.4
GSTA4	glutathione S-transferase A4	12.61	2	10.1	74	25.7	6.8
GSTM1	glutathione S-transferase Mu 1	32.57	3	23.0	191	25.5	6.4
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9
GSTO1	glutathione S-transferase omega-1 isoform 1	27.92	6	20.4	80	27.4	8.0
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	9.80	2	7.6	51	29.6	9.4
GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2
GRN	granulins isoform 2	4.90	2	9.3	51	63.9	6.4
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0
HMOX1	heme oxygenase 1	15.86	3	12.7	46	33.0	6.6
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	7.69	2	2.6	41	25.6	5.4
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3
RBBP7	histone-binding protein RBBP7	4.35	2	4.7	44	43.6	5.1
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
IFNAR2	Interferon-alpha/beta receptor beta chain	8.30	2	7.4	87	28.7	5.6
ILF2	interleukin enhancer-binding factor 2	6.15	2	7.6	105	43.0	5.3
IL1RAP	Interleukin-1 receptor accessory protein	5.95	2	5.3	53	41.0	6.5

KRT5	keratin, type II cytoskeletal 5	1.80	1	2.4		54.4	5.4
LIFR	Leukemia inhibitory factor	17.09	2	7.6	43	17.4	8.9
SSB	Lupus La protein	4.91	2	7.3		46.8	9.7
PRCP	lysosomal Pro-X carboxypeptidase	5.69	2	8.6	75	55.4	6.7
CSF1	macrophage colony-stimulating factor 1 isoform 1	7.43	2	8.4	77	60.7	5.5
MIF	macrophage migration inhibitory factor	17.39	2	3.0	185	12.4	7.3
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.23	2	12.6	175	47.5	7.5
NHP2L1	NHP2 protein 1	16.44	1	2.9	62	8.0	7.9
Cald1	non-muscle caldesmon	4.34	2	6.8	44	60.5	6.9
NAP1L1	Nucleosome assembly protein 1 1	13.85	2	9.4	81	27.1	4.7
VNN1	Pantetheinase	5.27	2	7.4	131	56.7	5.5
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	5.05	2	8.3	61	60.9	7.9
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	7.15	4	15.9	139	83.7	6.6
PTGFRN	Prostaglandin F2 receptor negative regulator	2.78	2	4.9	53	81.5	6.6
PSMA6	proteasome subunit alpha type-6, partial	5.91	1	4.3	74	24.4	6.6
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1
PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0
PSMB4	proteasome subunit beta type-4	14.02	2	8.5	109	29.2	5.5
PSMB7	proteasome subunit beta type-7	15.16	2	7.0	47	29.9	8.0
PPM1G	Protein phosphatase 1G	9.88	2	7.5	53	54.0	4.3
SHISA5	protein shisa-5	12.81	2	8.1		25.9	6.5
RBM3	Putative RNA-binding protein 3	35.50	3	17.9	231	18.1	9.1
PDXK	Pyridoxal kinase	11.11	1	3.1	67	9.6	10.7
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	2.92	2	10.2	100	90.9	4.7
ATP6AP2	Renin receptor	12.00	3	8.7		33.8	5.2
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7
RCN3	Reticulocalbin-3	9.26	2	8.1	143	37.5	4.9
RNASE4	ribonuclease 4	36.05	3	16.0	44	17.0	9.3
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7
RBM8A	RNA-binding protein 8A	17.24	2	9.9	79	19.9	5.7

EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3
SEMA4B	Semaphorin-4B	4.33	2	6.1		49.0	7.2
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	7.87	3	5.7	43	59.0	5.1
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.8	9.0
SUMO2	small ubiquitin-related modifier 2	23.16	2	6.1	41	10.8	5.5
DDX39B	Spliceosome RNA helicase BAT1	9.35	3	6.9	50	49.0	5.7
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7
SOD1	superoxide dismutase	14.88	2	11.5	85	25.9	9.6
SDC4	syndecan-4	18.81	3	21.6	114	22.2	4.6
TXNDC5	Thioredoxin domain-containing protein 5	8.42	2	6.8		33.4	5.5
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3
TPM1	tropomyosin alpha-1 chain	29.23	6	56.1	224	32.8	4.8
TPM3	tropomyosin alpha-3 chain isoform 3	24.60	5	16.8	189	28.9	4.8
TPM2	Tropomyosin beta chain	8.68	2	7.3	71	30.7	4.8
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0
TNFAIP6	tumor necrosis factor-inducible gene 6 protein	8.73	2	6.5	76	31.0	7.6
AXL	Tyrosine-protein kinase receptor UFO	24.63	2	26.9	223	22.4	5.3
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2, partial	13.10	2	8.2	52	15.4	4.9
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3
VASN	vasorin	13.52	5	32.6	275	72.5	7.5
VAPA	vesicle-associated membrane protein-associated protein A	11.65	2	6.6	57	29.7	8.8
SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
PSMD2	26S proteasome non-ATPase regulatory subunit 2-like	4.52	3	12.2	124	100.1	5.2
RPL31	60S ribosomal protein L31-like	18.40	2	3.5	43	14.3	10.0
GCLM	glutamate--cysteine ligase regulatory subunit-like	8.49	2	5.4	48	30.4	7.0
GSTP1	glutathione S-transferase P 2-like	16.67	2	9.6	137	24.1	8.4
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0

PTGES3	prostaglandin E synthase 3-like	13.66	2	6.1	62	18.9	4.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
FAT1	protocadherin Fat 1-like	1.44	5	18.8	168	506.4	5.0
RAB10	ras-related protein Rab-10-like	16.50	3	8.2	81	22.6	8.4
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6
SDCBP	syntenin-1-like	11.41	2	8.0		32.3	7.2
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TYMS	thymidylate synthase-like	18.24	4	17.6	156	34.8	6.9
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
UBE2L3	ubiquitin-conjugating enzyme E2 L3-like	15.58	2	2.3	42	17.8	8.2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8
CMPK1	UMP-CMP kinase-like	12.14	2	6.2	46	19.9	5.4
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1
HDLBP	vigilin-like	2.21	2	7.2	91	141.6	6.9

Table 3.3.54: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with two or more peptides as being unique to that cell line when compared to the HCP content of an IgG secreting DP12 cell line at 31˚C.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component	2.26	2	6.3	78	109.4	5.0
RPS20	40S ribosomal protein S20	11.03	2	3.8	60	15.2	9.9
RPS3A	40S ribosomal protein S3a, partial	16.83	2	4.7	51	11.4	9.9
RPS9	40S ribosomal protein S9	13.85	2	4.9		14.8	10.8
RPL13	60S ribosomal protein L13	11.34	2	6.2	73	22.4	11.8
RPL15	60S ribosomal protein L15, partial	8.08	2	4.8		23.5	11.6
RPL27	60S ribosomal protein L27	15.45	2	7.1	45	12.1	10.1
RPL30	60S ribosomal protein L30	27.83	3	8.5	59	12.8	9.6
RPL7A	60S ribosomal protein L7a	20.00	2	6.8	62	15.6	11.4
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A	7.69	2	5.7	76	28.5	4.1
ACTG1	actin, cytoplasmic 2, partial	42.82	3	48.9	519	38.5	5.4
AHSA1	Activator of 90 kDa heat shock protein ATPase homolog 1	8.88	3	7.4	45	38.1	5.5
CRKL	adapter molecule crk	11.31	2	8.4	54	36.1	5.7
AGRN	agrin isoform 2	3.21	4	12.8	75	205.7	6.0
GALM	aldose 1-epimerase	8.48	2	6.6	113	37.8	6.6
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	19.67	7	12.1	131	42.3	7.4
ANXA8	Annexin A8	21.09	2	7.7	65	14.5	9.1
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.18	2	4.6		54.4	6.4
B2M	Beta-2-microglobulin	37.04	2	7.9	42	6.4	5.8
CACYBP	Calcyclin-binding protein	8.70	2	4.6	47	21.2	7.3
CAST	calpastatin	3.38	2	7.3	59	82.8	5.3
CD109	CD109 antigen isoform 1	1.76	2	6.3	50	152.9	6.2
COL3A1	collagen alpha-1(III) chain isoform 1	1.57	2	116.4	1321	139.0	6.6
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	5.67	2	9.4	89	72.6	8.7
DPYSL2	dihydropyrimidinase-related protein 2	6.12	2	2.3	52	62.2	6.4
DPP3	dipeptidyl peptidase 3	7.05	3	12.5	119	82.9	5.2
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	6.14	3	15.0	115	73.6	7.5
DDB1	DNA damage-binding protein 1	2.54	3	7.4		126.8	5.3
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	110	102.1	5.6
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4
EFHD2	EF-hand domain-containing protein D2	20.86	2	7.7	84	15.9	5.3
EFEMP1	EGF-containing fibulin extracellular matrix protein 1	7.76	2	3.3	110	48.8	5.0

EEF1D	elongation factor 1-delta isoform 2	8.70	2	6.8	63	30.7	5.0
EMILIN1	EMILIN-1	5.41	5	18.5	158	107.2	5.4
MAN2B2	Epididymis-specific alpha-mannosidase	2.99	2	7.6	69	111.3	7.5
EIF3A	Eukaryotic translation initiation factor 3 subunit A	2.06	3	8.2	73	163.9	6.7
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	6.3	84	28.2	4.8
EIF3I	eukaryotic translation initiation factor 3 subunit I	8.62	2	7.2	55	36.3	5.6
ECM1	extracellular matrix protein 1	4.09	2	7.0	70	63.2	6.8
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FLNA	Filamin-A	1.49	3	32.8	246	263.5	5.8
FLNB	filamin-B isoform 3	0.85	2	5.4	43	275.1	5.7
FKBP4	FK506-binding protein 4	5.60	2	6.9	84	46.6	5.8
PRKCSH	glucosidase 2 subunit beta isoform 2	12.57	6	14.6	110	59.1	4.5
Gstm7	glutathione S-transferase Mu 7	36.70	2	23.8	359	25.9	7.4
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GARS	glycyl-tRNA synthetase	3.10	2	5.9	53	79.8	6.8
GLOD4	glyoxalase domain-containing protein 4	8.39	2	5.9	76	33.2	5.5
GPR56	G-protein coupled receptor 56	3.20	2	32.4	290	77.3	8.8
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5
HSP90AA1	heat shock protein HSP 90-alpha	17.33	5	70.2	673	84.8	5.0
HPSE	heparanase	4.83	2	6.3		60.9	9.0
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	14.69	3	2.3	83	34.1	9.2
HMGB2	High mobility group protein B2	20.13	3	9.0		18.2	5.4
HAT1	Histone acetyltransferase type B catalytic subunit	4.77	2	5.5	78	49.4	6.2
CDC37	hsp90 co-chaperone Cdc37	8.71	2	6.9		44.4	5.3
IGSF8	immunoglobulin superfamily member 8	3.20	2	5.2	69	63.2	8.0
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	6.03	2	10.4	43	55.9	7.3
ISYNA1	Inositol-3-phosphate synthase 1	8.37	2	3.1	81	46.9	5.7
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2
N/A	Lamin-L(I)	4.76	2	6.9	72	54.9	4.9
LTBP1	Latent-transforming growth factor beta-binding protein 1	2.01	2	3.0	57	130.0	5.1
N/A	liver carboxylesterase isoform 2	3.22	2	6.9		58.6	5.9
LOXL4	Lysyl oxidase 4	2.91	2	32.6	364	84.7	8.0
KARS	lysyl-tRNA synthetase isoform 1	6.20	2	4.3	61	67.9	6.2
MYL9	myosin regulatory light polypeptide 9	12.21	2	5.1	40	19.9	4.8
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase isoform 2	8.93	3	10.5	74	36.1	6.8
NTN4	Netrin-4	4.01	2	5.1	71	64.0	8.1

NENF	neudesin	11.29	2	2.7	45	20.4	7.8
NCAM1	Neural cell adhesion molecule 1	1.96	2	6.0	65	114.2	4.8
NRP1	neuropilin-1	3.90	2	7.6	98	103.0	5.9
NASP	nuclear autoantigenic sperm protein	2.47	2	5.5	56	83.4	4.4
NUMA1	nuclear mitotic apparatus protein 1, partial	1.13	2	7.8	71	229.7	5.6
NCL	nucleolin, C23, partial	3.53	2	8.2	81	73.2	4.7
OLFML2B	olfactomedin protein 2B	3.07	2	3.4	67	83.5	4.9
Q86UD1	Out at first protein	21.71	3	7.6		17.7	8.1
PAPLN	Papilin	2.89	2		79	127.2	7.3
PTX3	pentraxin-related protein PTX3	4.99	2	7.0	78	42.2	5.4
PPIA	Peptidyl-prolyl cis-trans isomerase A	14.06	2	116.9	1144	14.1	6.8
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	29.63	3	7.8	118	11.9	8.7
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	16.81	5	7.6	94	51.5	5.5
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	6.49	3	9.2		63.0	5.1
PGM1	Phosphoglucomutase-1	4.90	2	6.6	105	62.8	5.9
PSAT1	Phosphoserine aminotransferase	11.00	3	10.2	103	33.9	8.0
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PSPH	phosphoserine phosphatase	7.56	2	4.8	46	25.0	5.5
PLEC	plectin	0.81	3	13.2	59	533.6	5.9
PABPC1	polyadenylate-binding protein 1, partial	8.41	2	19.8	116	63.4	9.6
PTBP1	Polypyrimidine tract-binding protein 1	5.28	3	7.9		57.0	9.2
PFDN2	prefoldin subunit 2	16.88	2	5.6	82	16.7	6.6
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9
Q8NBJ5	Procollagen galactosyltransferase 1	5.45	2	6.2	89	53.2	7.3
PDCD6IP	Programmed cell death 6-interacting protein	2.97	2	6.5	79	89.1	6.1
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	5.52	2	9.0	134	58.0	5.7
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
PSMA4	proteasome subunit alpha type-4	13.41	2	11.8	127	29.5	7.7
CNPY2	Protein canopy 2	26.80	2	5.6	48	11.0	4.8
S100A11	protein S100-A11	26.00	2	7.3	95	11.2	7.1
PCDH7	Protocadherin-7	3.19	2	6.9	79	105.3	5.2
NPEPPS	puromycin-sensitive aminopeptidase	2.01	2	5.2		105.6	6.1
D1Pas1	putative ATP-dependent RNA helicase Pl10	6.49	2	9.1	103	58.1	7.1
N/A	pyruvate kinase isozymes M1/M2 isoform 2	9.85	3	19.3	96	49.8	6.6
RDX	radixin	7.03	2	18.1	112	68.5	6.3
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	4.62	2	5.6	42	55.5	8.0
RNASET2	ribonuclease T2	10.04	2	4.4	60	29.5	6.7

RPIA	Ribose-5-phosphate isomerase	7.69	2	6.6	70	29.5	7.0
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
SARNP	SAP domain-containing ribonucleoprotein	16.67	2	6.0	106	19.4	5.9
SEMA3B	semaphorin-3B	5.07	3	5.0	41	83.0	8.4
SEPT11	septin-11	4.47	2	5.9	53	49.0	7.0
SEPT9	septin-9	3.71	2	6.1	42	63.7	8.3
STRAP	Serine-threonine kinase receptor-associated protein	7.43	2	5.0	71	38.5	5.1
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	31.18	2		77	10.4	4.8
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9
MTAP	S-methyl-5'-thioadenosine phosphorylase	9.54	2	2.6	47	31.0	7.1
SPTBN1	Spectrin beta chain, brain 1	3.78	2	9.7	146	94.5	5.9
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
SRM	Spermidine synthase	9.06	2	5.4	44	28.7	5.5
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2	2.73	2	4.6		98.2	5.6
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.1	40	22.3	7.9
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	4.23	2	7.0	88	74.7	7.6
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
SRPX	Sushi repeat-containing protein SRPX	6.47	2	8.6	74	37.9	8.4
THOP1	thimet oligopeptidase	4.51	2	7.6	82	78.1	6.0
PLAT	tissue-type plasminogen activator	4.29	2	5.4	73	63.0	8.2
BTF3	transcription factor BTF3	17.90	2	2.7	65	17.7	6.9
TMEM132A	transmembrane protein 132A	4.40	3	11.3	65	110.0	5.3
GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	5.7	44	107.5	6.8
TPM2	tropomyosin beta chain, partial	13.95	2	10.6	84	29.9	4.6
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBB2A	Tubulin beta-2 chain	26.57	3	43.4	331	46.5	5.0
TUBB2A	tubulin beta-2A chain	9.21	2	52.8	357	27.3	5.1
TBCA	Tubulin-specific chaperone A	22.62	2	5.1	77	9.9	4.7
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	1.82	2	7.1	52	158.1	6.0
UCHL3	ubiquitin carboxyl-terminal hydrolase isozyme L3	7.52	2	7.3	71	33.9	5.8
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	3.89	2	2.8	79	78.4	5.5
D17Wsu104e	UPF0556 protein C19orf10 homolog	18.82	3	7.9	58	18.4	6.8
VPS35	vacuolar protein sorting-associated protein 35	3.11	2	5.8	41	96.0	5.5

Table 3.3.55: Table displaying the number of proteins identified in the conditioned media of a CHO K1 cell line grown under temperature shift and non-temperature shift cultures with samples taken at 24, 72, 96 and 120 hours post temperature shift. RAW files from the mass spectral analysis were searched against the CHO NCBI and CHO BB protein databases. Columns are divided into those proteins identified by 1 peptide and proteins identified by 2 or more peptides.

	1 Peptide	**2 or more peptides**	**Total**
CHO NCBI	364	602	966
CHO BB	225	544	769

Table 3.3.56: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being common to both NCBI and CHO BB databases.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	No. of peptides used for ID from BB Database	No. of peptides used for ID from NCBI Database
HSPE1	10 kDa heat shock protein, mitochondrial-like	9.80	1	2.4		11.0	8.9	1	1
YWHAE	14-3-3 protein epsilon	57.14	4	7.8	65	7.9	6.5	≥2	≥2
YWHAH	14-3-3 protein eta	21.19	3	13.5	111	27.1	5.0	≥2	≥2
YWHAQ	14-3-3 protein theta-like	24.90	5	22.8	203	27.7	4.8	≥2	≥2
YWHAZ	14-3-3 protein zeta/delta-like	33.88	5	20.8	266	27.7	4.8	≥2	≥2
PSMC1	26S protease regulatory subunit 4	2.52	1	5.9	85	53.3	5.8	1	1
PSMC2	26S protease regulatory subunit 7	5.17	2	6.7	45	52.0	5.8	≥2	1
PSMD4	26S proteasome non-ATPase regulatory subunit 4	5.79	2	10.7	124	41.1	4.8	≥2	≥2
PSMD9	26S proteasome non-ATPase regulatory subunit 9-like	5.41	1	2.4		24.6	6.7	1	1
RPS10	40S ribosomal protein S10	3.98	1	3.1	70	26.1	9.4	1	1
RPS11	40S ribosomal protein S11-like	12.03	2	5.7	56	18.3	10.0	≥2	≥2
RPS12	40S ribosomal protein S12	15.70	2	5.5	54	13.5	7.9	≥2	≥2
RPS13	40S ribosomal protein S13	5.30	1		49	15.2	10.3	1	1
RPS15A	40S ribosomal protein S15a	30.77	4	9.6	41	14.8	10.1	≥2	≥2
RPS16	40S ribosomal protein S16	11.52	2	5.7	63	18.5	10.3	≥2	1
RPS18	40S ribosomal protein S18	17.70	2	5.4	47	13.1	9.9	≥2	≥2
RPS19	40S ribosomal protein S19	25.61	5	13.6	108	18.0	10.2	≥2	1
RPS2	40S ribosomal protein S2	24.20	3	8.8	76	16.9	9.8	≥2	≥2
RPS20	40S ribosomal protein S20	11.03	2		70	15.2	9.9	≥2	≥2
RPS21	40S ribosomal protein S21	39.76	3	8.8	102	9.1	8.3	≥2	1
RPS25	40S ribosomal protein S25	24.39	3	5.8	76	13.5	10.1	≥2	≥2
RPS26	40S ribosomal protein S26	10.47	1	2.4		9.7	9.9	1	1
RPS27	40S ribosomal protein S27	22.41	1	3.3	67	6.8	8.0	1	1
RPS3A	40S ribosomal protein S3a	21.59	6	16.6	70	29.9	9.7	≥2	1
RPS3	40S ribosomal protein S3-like	34.82	7	24.0	172	27.0	9.3	≥2	≥2
RPS6	40S ribosomal protein S6	29.85	2	7.0		7.6	5.0	≥2	≥2
RPS8	40S ribosomal protein S8	31.25	5	16.9	200	24.2	10.3	≥2	≥2

RPS9	40S ribosomal protein S9	20.77	3	7.4	41	14.8	10.8	≥2	≥2
RPSA	40S ribosomal protein SA	27.37	4	22.3	309	19.7	9.3	≥2	≥2
SDF4	45 kDa calcium-binding protein	24.51	7	24.3	166	41.2	4.9	≥2	≥2
RPLP0	60S acidic ribosomal protein P0	23.53	5	20.1	180	29.9	8.5	≥2	≥2
RPLP2	60S acidic ribosomal protein P2	57.39	5	21.6	228	11.7	4.6	≥2	1
RPL10	60S ribosomal protein L10	5.52	1	2.5		18.6	9.9	1	1
RPL11	60S ribosomal protein L11	19.76	3	8.5	81	19.0	9.8	≥2	≥2
RPL12	60S ribosomal protein L12	26.12	2	3.5	94	14.7	9.6	≥2	≥2
RPL13	60S ribosomal protein L13	16.49	3	7.9	80	22.4	11.8	≥2	≥2
RPL13A	60S ribosomal protein L13a	9.40	1	6.2	91	13.6	10.6	1	1
RPL14	60S ribosomal protein L14	4.49	1	3.4	66	29.5	11.0	1	1
RPL17	60S ribosomal protein L17	4.27	1	2.6	46	26.5	10.0	1	1
RPL18A	60S ribosomal protein L18a	15.48	1	3.3	53	10.0	11.2	1	1
RPL19	60S ribosomal protein L19	15.52	1	2.9	51	6.9	9.8	1	1
RPL23	60S ribosomal protein L23	17.86	2	10.8	117	14.9	10.5	≥2	1
RPL23A	60S ribosomal protein L23a	33.97	5	17.0	175	17.7	10.4	≥2	≥2
RPL26	60S ribosomal protein L26	17.93	4	10.7	47	17.2	10.6	≥2	1
RPL27	60S ribosomal protein L27	15.45	2	4.6	41	12.1	10.1	≥2	≥2
RPL27A	60S ribosomal protein L27a	7.63	1	2.4		14.6	9.9	1	1
RPL29	60S ribosomal protein L29	9.65	1	3.2	62	12.4	11.5	1	1
RPL3	60S ribosomal protein L3	7.20	3	6.5	119	46.1	10.2	1	≥2
RPL30	60S ribosomal protein L30	12.77	2	6.7		10.5	9.3	≥2	≥2
RPL31	60S ribosomal protein L31-like	7.20	1	3.0	65	14.4	10.5	≥2	1
RPL35	60S ribosomal protein L35	8.20	1	2.8		14.4	10.7	1	1
RPL4	60S ribosomal protein L4	5.56	1	3.4	44	21.9	10.2	1	1
RPL5	60S ribosomal protein L5	16.50	4	11.6	68	34.4	9.7	≥2	1
Rpl6	60S ribosomal protein L6	9.97	2	6.3		32.8	10.5	≥2	≥2
RPL7	60S ribosomal protein L7	12.94	1	3.4	74	10.0	10.0	1	1
RPL7A	60S ribosomal protein L7a	15.56	2	7.4	107	19.8	10.6	≥2	≥2
RPL8	60S ribosomal protein L8	8.33	1	2.9	56	14.1	10.6	1	1
RPL9	60S ribosomal protein L9	5.21	1	2.5	55	21.9	9.9	1	1
PFKL	6-phosphofructokinase, liver type	1.21	1	3.0		81.5	7.4	1	1
PGD	6-phosphogluconate dehydrogenase, decarboxylating-like	11.80	5	18.3	171	53.3	6.6	≥2	≥2
ACAT2	acetyl-CoA acetyltransferase, cytosolic-like	7.05	2		87	41.0	7.3	≥2	≥2

ASAH1	acid ceramidase-like	22.78	9	23.1	159	44.7	7.9	≥2	≥2
ANP32A	acidic leucine-rich nuclear phosphoprotein 32 family member A-like	10.93	3	8.6	102	28.5	4.1	≥2	≥2
ANP32B	Acidic leucine-rich nuclear phosphoprotein 32 family member B	7.34	1	2.3		12.4	6.6	1	1
ACTG1	Actin, cytoplasmic 2	45.48	15	82.0	755	41.8	5.5	≥2	1
SUB1	Activated RNA polymerase II transcriptional coactivator p15	22.83	2	6.0	85	14.4	9.6	≥2	1
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	8.88	3	7.4	45	38.1	5.5	≥2	≥2
DBI	acyl-CoA-binding protein	41.38	3	5.7	65	10.0	8.8	≥2	≥2
CRKL	adapter molecule crk-like	17.13	4	16.1	140	36.1	5.7	≥2	≥2
APRT	adenine phosphoribosyltransferase-like	13.89	2	6.7	51	19.4	6.0	≥2	≥2
ADK	Adenosine kinase	3.32	1	3.5		40.2	6.6	1	1
AHCY	adenosylhomocysteinase	17.59	7	25.1	193	47.6	6.5	≥2	≥2
AK2	Adenylate kinase 2, mitochondrial	15.49	2	8.5	80	15.4	7.9	≥2	≥2
ADSL	Adenylosuccinate lyase	4.55	2	6.2	66	54.9	6.9	≥2	≥2
AARS	alanyl-tRNA synthetase, cytoplasmic-like	5.99	5	17.4	121	106.8	5.6	≥2	≥2
ADH5	Alcohol dehydrogenase class-3	11.35	2	3.0	123	34.1	7.2	≥2	≥2
GALM	aldose 1-epimerase-like	11.40	3	10.5	165	37.8	6.6	≥2	≥2
Akr1b1	aldose reductase-like	24.68	7	25.8	184	35.8	7.4	≥2	≥2
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	20.23	7	12.1	117	41.1	7.1	≥2	≥2
ACTN1	Alpha-actinin-1	16.06	10	34.1	301	104.5	5.8	≥2	≥2
ACTN4	Alpha-actinin-4	29.49	4	18.8	182	26.2	4.8	≥2	≥2
ENO1	alpha-enolase	52.45	21	79.4	834	46.7	6.2	≥2	≥2
GLA	Alpha-galactosidase A	16.13	4	16.4	134	38.5	5.0	≥2	≥2
IDUA	alpha-L-iduronidase	9.36	5	8.8	83	72.1	6.8	≥2	≥2
MAN2A1	Alpha-mannosidase 2	2.18	2	6.5	79	125.3	7.5	≥2	≥2
NAGA	alpha-N-acetylgalactosaminidase-like	32.05	10	38.8	383	47.2	7.8	≥2	≥2
NAGLU	alpha-N-acetylglucosaminidase-like	11.76	8	20.3	157	83.4	6.7	≥2	≥2
AIMP1	aminoacyl tRNA synthase complex-interacting multifunctional protein 1	5.01	1	4.0	40	39.6	9.3	1	1
APP	amyloid beta A4 protein	23.61	16	74.8	590	85.0	4.9	≥2	≥2
APLP2	Amyloid-like protein 2	19.35	11	32.0	343	78.3	4.9	≥2	≥2
ANXA1	annexin A1-like	52.60	15	53.3	529	38.8	7.0	≥2	≥2
ANXA5	annexin A5-like	20.25	6	18.1	127	36.0	5.0	≥2	≥2
ANXA8	annexin A8-like	8.26	2	7.7	65	36.7	5.9	≥2	≥2
AP1B1	AP-1 complex subunit beta-1-like	2.32	2	2.3	43	99.6	5.0	≥2	≥2
APOA1	Apolipoprotein A-I-binding protein	5.85	1	2.8		22.4	7.3	1	1

API5	apoptosis inhibitor 5	4.76	2	6.0	68	56.8	5.9	≥2	≥2
RARS	Arginyl-tRNA synthetase, cytoplasmic	2.03	1	2.9		62.0	6.6	1	1
ARSA	arylsulfatase A	15.06	5	20.0	237	55.0	5.1	≥2	≥2
GOT1	aspartate aminotransferase, cytoplasmic	13.56	5	15.2	135	46.2	7.2	≥2	≥2
DARS	Aspartyl-tRNA synthetase, cytoplasmic	4.18	2	4.6		54.4	6.4	≥2	≥2
ATXN10	Ataxin-10	4.97	1	3.5	70	34.2	4.9	1	1
ABCF1	ATP-binding cassette sub-family F member 1-like	1.31	1	2.4	46	95.4	6.5	1	1
DHX9	ATP-dependent RNA helicase A	5.19	5	17.4	67	144.3	6.9	≥2	≥2
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	32.50	98	440.3	4728	471.6	6.5	≥2	≥2
B4GALT1	Beta-1,4-galactosyltransferase 1	3.49	1	2.4	64	30.1	8.9	1	1
B2M	Beta-2-microglobulin	42.59	3	13.9	59	6.4	5.8	≥2	≥2
GLB1	Beta-galactosidase	9.85	6	14.8	103	73.6	6.9	≥2	≥2
GUSB	beta-glucuronidase	13.89	7	18.3	208	74.8	6.8	≥2	≥2
HEXA	beta-hexosaminidase subunit alpha	3.98	2	7.5		60.6	6.5	≥2	≥2
HEXB	Beta-hexosaminidase subunit beta	9.30	5	13.4	40	60.1	7.4	≥2	≥2
ATIC	bifunctional purine biosynthesis protein PURH	4.39	2	5.1	40	64.6	7.0	≥2	≥2
BLVRA	biliverdin reductase A-like	4.75	1	3.8	55	33.2	6.1	1	1
BTD	biotinidase	7.45	3	10.6	147	60.1	6.1	1	≥2
BMP1	bone morphogenetic protein 1	9.55	8	24.7	61	106.1	7.2	≥2	≥2
MTHFD1	c-1-tetrahydrofolate synthase, cytoplasmic-like	10.47	8	28.3	212	101.2	7.8	≥2	≥2
CHOPROTEASE	calcium-dependent serine proteinase-like	39.42	21	67.3	566	77.4	4.8	≥2	≥2
CACYBP	Calcyclin-binding protein	8.70	2	2.3	41	21.2	7.3	≥2	≥2
CALM1	Calmodulin	17.76	3	6.2	102	16.6	4.2	≥2	≥2
CALR	Calreticulin	18.23	8	18.6	139	48.2	4.5	≥2	≥2
CLSTN1	Calsyntenin-1	20.31	17	56.4	328	92.2	4.8	≥2	≥2
CALU	calumenin	10.79	3	9.1	119	37.0	4.7	≥2	≥2
CAPRIN1	Caprin-1	3.35	2	7.2	86	73.6	5.2	≥2	≥2
CPD	Carboxypeptidase D	1.99	1		48	123.4	6.2	1	1
CRTAP	cartilage-associated protein	2.85	1	2.3		32.7	4.9	1	1
CSNK2A1	casein kinase II subunit alpha	1.79	1	2.2		45.1	7.7	1	1
CAT	catalase	7.59	3	11.0	92	60.0	7.7	≥2	≥2
CTSB	cathepsin B-like	36.87	11	44.9	326	37.5	6.1	≥2	≥2
CTSD	cathepsin D	28.92	8	28.8	307	44.1	7.0	≥2	≥2
CTSL1	cathepsin L1-like	39.34	11	48.1	426	37.2	7.2	≥2	≥2

ALCAM	CD166 antigen-like	8.23	4	14.2	153	65.0	6.3	≥2	≥2
CD63	CD63 antigen	4.31	1	2.4		25.5	7.6	1	1
CDNF	cerebral dopamine neurotrophic factor-like	16.58	2	4.2	45	21.3	5.6	≥2	≥2
CLN5	Ceroid-lipofuscinosis neuronal protein 5	7.33	2	5.6	46	32.0	6.1	≥2	≥2
CLIC1	chloride intracellular channel protein 1-like	17.43	4	15.9	147	26.9	5.2	≥2	≥2
CLIC4	Chloride intracellular channel protein 4	10.43	2	6.0		24.1	6.4	≥2	≥2
CSPG4	chondroitin sulfate proteoglycan 4	30.09	49	223.0	2574	251.9	5.7	≥2	≥2
CBX1	chromobox protein homolog 1	10.27	2	5.0		21.4	4.9	≥2	≥2
CBX3	chromobox protein homolog 3	14.75	2	7.8		20.8	5.3	≥2	≥2
CLTC	clathrin heavy chain 1	5.25	7	16.3	199	191.6	5.8	≥2	≥2
CLU	clusterin	39.33	19	83.3	988	51.5	5.8	≥2	≥2
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1-like	14.71	4	14.6	142	38.9	9.4	1	≥2
ARCN1	coatomer subunit delta	2.15	1	3.2	40	57.2	6.2	1	1
CFL1	cofilin-1	52.41	8	38.3	384	18.5	8.1	≥2	≥2
CCDC8	coiled-coil domain-containing protein 80-like	22.36	16	53.3	582	107.4	9.7	≥2	≥2
CIRBP	Cold-inducible RNA-binding protein	5.98	1	3.2	60	19.8	9.6	1	1
COL3A1	Collagen alpha-1(III) chain	3.81	3	234.5	2745	114.9	4.9	≥2	≥2
COL5A1	Collagen alpha-1(V) chain	7.41	2		87	42.2	4.4	≥2	1
COL6A1	collagen alpha-1(VI) chain	11.88	10	30.0	241	109.7	5.4	≥2	≥2
COL16A1	collagen alpha-1(XVI) chain	1.13	1	4.7	65	156.3	7.7	1	1
COL5A2	collagen alpha-2(V) chain	10.14	10	31.6	291	145.0	6.0	≥2	≥2
C1ra	Complement C1r-A subcomponent	28.09	14	28.8	526	80.0	6.1	≥2	≥2
C3	Complement C3	10.70	16	44.3	280	182.1	6.7	≥2	≥2
CTGF	Connective tissue growth factor	4.60	1	4.3		38.1	7.9	1	1
CNTN1	Contactin-1	13.02	4	11.5	108	50.5	6.0	≥2	≥2
COPS4	COP9 signalosome complex subunit 4	2.96	1	2.4		46.3	5.8	1	1
SPRR1A	cornifin-A	28.32	1	2.2		12.4	7.9	1	1
CORO1B	coronin-1B	5.37	3	9.1	69	53.8	5.8	≥2	≥2
ABRACL	costars family protein C6orf115 homolog	11.11	1	2.9	52	9.0	5.8	1	1
Q9UEE9	craniofacial development protein 1	3.38	1	2.8		33.0	4.8	1	1
CAND1	cullin-associated NEDD8-dissociated protein 1-like	4.64	4	13.2	57	133.5	5.7	≥2	≥2
ATF4	Cyclic AMP-dependent transcription factor ATF-4	2.30	1	2.2		38.2	4.9	1	1
CSTB	cystatin-B-like	21.43	1	4.3		11.2	7.4	1	1
CSRP1	cysteine and glycine-rich protein 1-like	12.95	2	9.8	112	20.5	8.6	≥2	≥2

CRIP2	cysteine-rich protein 2-like	11.06	2	4.9	44	22.7	8.6	≥2	≥2
COX16	cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	21.70	2	6.4	46	12.3	9.6	≥2	≥2
Cycs	cytochrome c, somatic-like	32.38	3	10.5	68	11.7	9.5	≥2	≥2
LAP3	Cytosol aminopeptidase	13.20	5	16.1	165	50.2	6.9	≥2	≥2
ACOT7	Cytosolic acyl coenzyme A thioester hydrolase	3.43	1	2.5		35.6	7.5	1	1
CNDP2	cytosolic non-specific dipeptidase	9.89	4	11.2	94	52.8	5.9	≥2	≥2
PHGDH	d-3-phosphoglycerate dehydrogenase-like	13.32	6	20.9	222	56.5	6.9	≥2	≥2
DDTL	D-dopachrome decarboxylase-like	24.58	2	4.1	92	13.1	7.1	≥2	≥2
DCN	decorin-like	43.65	16	76.1	738	40.1	8.4	≥2	≥2
DNASE2	deoxyribonuclease-2-alpha-like	19.14	6	16.3	137	40.4	7.5	≥2	≥2
DSTN	destrin-like	12.12	2	6.3	55	18.6	7.7	≥2	≥2
DKK3	dickkopf-related protein 3-like	37.07	10	43.5	464	38.3	4.5	≥2	≥2
QDPR	dihydropteridine reductase-like	6.64	1		47	25.6	7.8	1	1
CTBS	Di-N-acetylchitobiase	5.15	1	2.5	57	32.9	5.7	1	1
DPP7	dipeptidyl peptidase 2-like	16.80	8	27.6	259	56.4	6.5	≥2	≥2
DPP3	dipeptidyl peptidase 3-like	11.92	6	14.6	177	82.9	5.2	≥2	≥2
DCBLD2	Discoidin, CUB and LCCL domain-containing protein 2	13.47	7	17.9	168	73.6	7.5	≥2	≥2
ADAM10	Disintegrin and metalloproteinase domain-containing protein 10	2.81	2	5.5	49	75.5	7.5	≥2	≥2
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	1.07	1	2.3		90.6	6.1	1	1
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	4.12	3	9.0	59	92.9	7.5	≥2	1
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	3.77	2	9.9	113	91.2	6.6	≥2	≥2
DDB1	DNA damage-binding protein 1-like	2.54	3	7.4		126.8	5.3	≥2	≥2
MCM2	DNA replication licensing factor MCM2	3.76	3	12.8	101	102.1	5.6	≥2	≥2
MCM3	DNA replication licensing factor MCM3	2.23	1		45	90.7	5.5	1	1
MCM6	DNA replication licensing factor MCM6	2.19	2	5.1		93.0	5.4	≥2	≥2
MCM7	DNA replication licensing factor MCM7	3.09	2	5.8	65	80.2	6.4	≥2	≥2
DNAJC8	dnaJ homolog subfamily C member 8-like	3.16	1	2.4		29.8	9.1	1	1
DBN1	Drebrin	3.02	1	2.8	83	65.3	4.5	1	1
DAG1	Dystroglycan	15.23	7	19.1	401	96.8	8.5	≥2	≥2
NEDD4	E3 ubiquitin-protein ligase NEDD4-like	3.60	3	8.6	71	108.4	5.7	≥2	≥2
EML2	Echinoderm microtubule-associated protein-like 2	6.62	2	5.1		32.7	6.1	≥2	1
EFHD2	EF-hand domain-containing protein D2	30.22	3	12.3	158	15.9	5.3	≥2	≥2
EFEMP1	EGF-containing fibulin-like extracellular matrix protein 1	29.68	10	49.1	527	48.8	5.0	≥2	≥2
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	10.13	3	10.6	63	42.0	5.4	≥2	≥2

ELAVL1	ELAV-like protein 1	3.28	1	3.0		37.1	9.2	1	1
EEF1A1	elongation factor 1-alpha 1	25.76	11	50.7	467	50.1	9.0	≥2	≥2
EEF1B2	elongation factor 1-beta-like	12.44	2	8.7	115	24.7	4.7	≥2	≥2
EEF1G	elongation factor 1-gamma	18.99	7	20.7	213	50.0	6.8	≥2	≥2
EEF2	elongation factor 2	30.65	21	78.1	538	95.3	6.8	≥2	≥2
MAN1B1	Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase	3.86	1	3.0		29.7	6.5	1	1
HSP90B1	endoplasmin	22.42	14	48.9	319	92.6	4.8	≥2	≥2
EDF1	Endothelial differentiation-related factor 1	14.15	1	3.9	42	11.7	10.0	1	1
NPC2	epididymal secretory protein E1	26.85	3	5.4	43	16.5	8.0	≥2	≥2
MAN2B2	Epididymis-specific alpha-mannosidase	9.28	7	17.4	167	111.3	7.5	≥2	≥2
EIF4A1	Eukaryotic initiation factor 4A-I	20.89	6	12.5	147	40.8	5.5	≥2	≥2
EIF4A3	Eukaryotic initiation factor 4A-III	6.57	2	10.1	40	46.8	6.7	≥2	1
ETF1	eukaryotic peptide chain release factor subunit 1	2.48	1	2.4		45.4	5.5	1	1
EIF2S1	eukaryotic translation initiation factor 2 subunit 1-like	13.65	4	14.7	106	36.1	5.1	≥2	≥2
EIF2S2	eukaryotic translation initiation factor 2 subunit 2	3.00	1	2.4		38.2	5.8	1	1
EIF2S3	eukaryotic translation initiation factor 2 subunit 3	5.08	2	9.5	79	51.1	8.4	≥2	≥2
EIF3A	eukaryotic translation initiation factor 3 subunit A-like	2.10	3	8.2	69	159.9	6.6	≥2	≥2
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.12	2	8.5	75	91.4	5.1	≥2	≥2
EIF3F	eukaryotic translation initiation factor 3 subunit F	11.02	2	11.1	102	28.2	4.8	≥2	≥2
EIF3G	eukaryotic translation initiation factor 3 subunit G-like	4.06	1	3.3		35.7	5.9	1	1
EIF3I	eukaryotic translation initiation factor 3 subunit I-like	8.62	2	6.4	54	36.3	5.6	≥2	≥2
EIF3J	eukaryotic translation initiation factor 3 subunit J	2.82	1	2.4		36.1	5.3	1	1
EIF3L	eukaryotic translation initiation factor 3 subunit L-like	3.55	1	3.0	50	66.6	6.3	1	1
EIF4B	eukaryotic translation initiation factor 4B	3.27	2	6.4	56	69.0	5.9	≥2	≥2
EIF5A	Eukaryotic translation initiation factor 5A-1	45.45	2	3.4	80	7.2	6.5	≥2	≥2
EIF6	eukaryotic translation initiation factor 6	13.06	2	3.0	90	26.6	4.7	≥2	≥2
EXT2	Exostosin-like 2	9.18	3	7.9	68	35.7	8.6	1	≥2
P55060	exportin-2-like	1.54	1	4.8	64	110.3	5.8	1	1
ECM1	extracellular matrix protein 1-like	20.78	9	26.8	330	63.2	6.8	≥2	≥2
EZR	Ezrin	13.14	5	27.1	216	69.3	6.4	≥2	≥2
CAPZA1	F-actin-capping protein subunit alpha-1	6.44	1	3.5	57	26.8	6.7	1	1
CAPZA2	F-actin-capping protein subunit alpha-2	6.20	2	6.1	95	45.4	7.0	≥2	≥2
CAPZB	F-actin-capping protein subunit beta	22.87	4	15.2	96	29.0	7.7	≥2	≥2
FASN	fatty acid synthase	2.56	5	11.0	109	271.7	6.4	≥2	≥2

FABP4	fatty acid-binding protein, adipocyte-like	20.45	2	6.8	94	14.7	7.9	≥2	≥2
FTH1	Ferritin heavy chain	24.73	4	3.2	118	21.5	6.2	≥2	≥2
FLNA	Filamin-A	10.53	19	59.5	624	263.5	5.8	≥2	≥2
BLVRB	Flavin reductase	13.11	3	8.2	65	22.1	8.4	≥2	1
FSTL1	follistatin-related protein 1	46.41	13	50.8	486	34.6	5.7	≥2	≥2
LGALS3BP	galectin-3-binding protein-like	43.73	18	65.8	703	63.8	5.2	≥2	≥2
LGALS3	galectin-3-like	8.05	2	7.9	62	27.2	8.9	≥2	≥2
IFI30	gamma-interferon-inducible lysosomal thiol reductase	11.79	4	19.2	217	27.4	5.2	≥2	≥2
GM2A	ganglioside GM2 activator-like	22.51	4	10.4	66	20.8	6.7	≥2	≥2
TSTA3	GDP-L-fucose synthase	3.74	1	3.6	51	35.8	7.1	1	1
USO1	General vesicular transport factor p115	1.99	1	3.0	66	84.2	4.9	1	1
GPI	glucose-6-phosphate isomerase	6.45	3	9.1	71	63.0	7.6	≥2	≥2
GBA	glucosylceramidase	17.28	7	32.2	196	57.4	8.1	≥2	≥2
N/A	glutaminyl-tRNA synthetase	1.29	1	2.3		87.7	7.2	1	1
GLRX3	glutaredoxin-3	11.50	3	8.3	58	32.5	5.7	≥2	≥2
GPX1	Glutathione peroxidase 1	11.72	1	3.9		16.5	6.6	1	1
GSR	Glutathione reductase, mitochondrial	7.80	2	3.8	49	44.9	6.8	≥2	≥2
Gsta3	Glutathione S-transferase alpha-3	21.88	3	10.5	58	14.7	7.4	≥2	≥2
GSTM5	glutathione S-transferase Mu 5-like	13.66	3	17.6	211	26.9	6.7	≥2	≥2
Gstm6	Glutathione S-transferase Mu 6	22.43	9	48.3	527	86.5	8.2	≥2	≥2
Gstm7	glutathione S-transferase Mu 7-like	36.70	2	23.8	359	25.9	7.4	≥2	≥2
Q00285	glutathione S-transferase Y1	27.98	6	15.9	157	26.0	8.4	≥2	≥2
GSS	glutathione synthetase-like	5.27	3	7.3	68	52.2	5.6	≥2	≥2
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	31.15	4	6.5	138	27.5	9.0	≥2	≥2
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	6.81	1	3.0	46	21.9	5.2	1	1
GARS	glycyl-tRNA synthetase	4.94	3	9.0	111	79.8	6.8	≥2	≥2
GLOD4	glyoxalase domain-containing protein 4-like	8.39	2	5.9	76	33.2	5.5	≥2	≥2
GPC1	glypican-1	13.79	7	32.1	377	78.5	7.3	≥2	≥2
GLIPR2	Golgi-associated plant pathogenesis-related protein 1	11.11	1	3.4	58	13.0	9.1	1	1
GPR56	G-protein coupled receptor 56	13.37	8	35.9	322	77.3	8.8	≥2	≥2
RAN	GTP-binding nuclear protein Ran-like	24.54	5	13.5	88	24.5	8.3	≥2	≥2
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	3.0	51	30.5	5.2	1	1
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	44.57	11	38.7	226	30.4	7.4	≥2	≥2
HSPA13	Heat shock 70 kDa protein 13	12.95	6	25.4	178	51.9	6.7	≥2	1

HSPA4	Heat shock 70 kDa protein 4	4.83	2	10.7	106	63.0	5.1	≥2	≥2
HSPA8	heat shock cognate 71 kDa protein	42.88	26	123.7	1326	70.8	5.4	≥2	≥2
HSPH1	Heat shock protein 105 kDa	1.29	1	2.5		87.9	5.8	1	1
HSPB1	Heat shock protein beta-1	40.48	2	3.7	85	8.9	6.5	≥2	≥2
HSP90AA1	heat shock protein HSP 90-alpha	23.47	10	82.4	778	84.8	5.0	≥2	≥2
HSP90AB1	heat shock protein HSP 90-beta-like	37.15	18	122.6	982	83.1	5.0	≥2	≥2
HPSE	heparanase	7.25	3	10.0		60.9	9.0	≥2	≥2
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	25.59	4	7.3	134	23.7	9.6	≥2	≥2
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	23.47	2	6.9	111	11.3	9.9	≥2	≥2
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	16.48	4	16.0	124	26.9	8.8	≥2	≥2
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	9.34	2	9.4	145	29.3	9.3	≥2	≥2
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	6.25	2	3.0	63	45.8	5.6	≥2	1
RBMX	heterogeneous nuclear ribonucleoprotein G	12.80	3	6.3	126	31.5	9.8	≥2	≥2
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	6.27	2	3.2	54	45.2	7.6	1	≥2
HNRNPL	Heterogeneous nuclear ribonucleoprotein L	13.88	2	6.9		23.5	7.4	≥2	1
HNRNPM	Heterogeneous nuclear ribonucleoprotein M	4.01	1		49	60.3	8.6	1	1
HNRNPU	heterogeneous nuclear ribonucleoprotein U	9.05	5	17.7	48	69.8	8.9	≥2	≥2
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	12.41	3	9.8	68	29.0	8.6	≥2	≥2
HMGB1	High mobility group protein B1	12.32	2	3.4	84	23.5	6.3	≥2	≥2
HMGB2	High mobility group protein B2	20.13	3	9.0		18.2	5.4	≥2	≥2
HMGA1	high mobility group protein HMG-I/HMG-Y	27.14	1	4.1	72	8.0	6.8	1	1
HAT1	Histone acetyltransferase type B catalytic subunit	11.17	2	5.5	78	21.4	8.8	≥2	≥2
H1F0	histone H1.0-like	16.49	3	8.6	109	20.9	10.9	≥2	≥2
H2AFZ	Histone H2A.Z	20.31	2	10.7	70	13.5	10.6	≥2	1
HIST1H4A	Histone H4	28.14	5	17.9	236	21.8	10.7	≥2	≥2
RBBP7	histone-binding protein RBBP7	8.44	2	7.0		43.6	5.1	≥2	≥2
ST13	Hsc70-interacting protein	24.19	2	6.5		13.9	6.8	≥2	≥2
CDC37L1	hsp90 co-chaperone Cdc37-like	12.66	3	13.2	100	44.4	5.3	≥2	≥2
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic-like	11.73	5	14.3	135	57.3	5.7	≥2	≥2
HPRT1	hypoxanthine-guanine phosphoribosyltransferase-like	11.68	2	7.0	140	24.2	7.0	≥2	≥2
HYOU1	Hypoxia up-regulated protein 1	7.11	5	8.3	156	111.4	5.2	≥2	≥2
IGSF8	immunoglobulin superfamily member 8	6.90	4	10.8	84	63.2	8.0	≥2	≥2
KPNA2	importin subunit alpha-2	1.51	1	2.3		57.8	5.3	1	1
KPNB1	importin subunit beta-1	7.46	6	18.0	147	98.2	4.8	≥2	≥2

IPO5	Importin-5	3.00	2	5.4	55	89.7	5.0	≥2	≥2
IPO7	importin-7	3.66	3	10.5	87	119.4	4.8	≥2	≥2
PRSS35	inactive serine protease 35	3.88	1	4.0	61	46.0	9.7	1	1
PPA1	Inorganic pyrophosphatase	15.50	3	12.0	151	37.0	5.3	≥2	≥2
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	8.37	3	10.0	66	55.9	7.3	≥2	≥2
ISYNA1	Inositol-3-phosphate synthase 1	4.42	2	5.4	45	46.9	5.7	≥2	≥2
IGFBP4	insulin-like growth factor-binding protein 4-like	20.87	5	20.2	137	27.7	7.1	≥2	≥2
ITM2B	integral membrane protein 2B	4.89	1		46	30.3	5.1	1	1
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	35.93	30	120.7	937	102.0	8.6	≥2	≥2
ILF2	Interleukin enhancer-binding factor 2	23.42	2	8.9	61	17.0	8.2	≥2	≥2
ILF3	interleukin enhancer-binding factor 3	4.24	3	9.2	65	95.8	8.7	≥2	≥2
IDI1	isopentenyl-diphosphate Delta-isomerase 1-like	5.29	1	2.8		26.3	5.9	1	1
KDELC2	KDEL motif-containing protein 2	3.98	1	4.4	46	52.4	7.5	1	1
KGFLP1	keratinocyte growth factor	4.64	1	2.3		22.4	9.1	1	1
MFGE8	Lactadherin	66.43	9	38.8	304	16.1	9.4	≥2	≥2
GLO1	lactoylglutathione lyase-like	9.24	2	5.1	45	20.9	5.3	≥2	≥2
LAMA2	Laminin subunit alpha-2	2.56	2	5.5		116.3	8.2	≥2	≥2
LAMB1	laminin subunit beta-1	22.65	42	132.4	1069	202.4	5.0	≥2	≥2
LAMC1	laminin subunit gamma-1	18.22	24	100.0	1256	172.0	5.1	≥2	≥2
LTBP1	Latent-transforming growth factor beta-binding protein 1	7.79	6	16.1	86	130.0	5.1	≥2	≥2
LPHN2	latrophilin-2-like	0.87	1	3.3	46	166.7	6.6	1	1
MESDC2	LDLR chaperone MESD-like	4.42	1	2.8		25.1	6.3	1	1
LGMN	legumain	27.85	10	33.1	411	49.6	6.6	≥2	≥2
LIFR	Leukemia inhibitory factor	6.33	1	3.0	40	17.4	8.9	1	1
SERPINB1	leukocyte elastase inhibitor A	21.90	8	27.9	190	42.9	6.2	≥2	≥2
LTA4H	Leukotriene A-4 hydrolase	2.08	1	3.1		59.7	6.3	1	1
LASP1	LIM and SH3 domain protein 1	20.26	4	12.4	78	25.8	5.9	≥2	≥2
LPL	Lipoprotein lipase	42.00	14	40.7	591	50.5	7.9	≥2	≥2
LDHA	L-lactate dehydrogenase A chain	33.13	9	36.9	362	36.5	7.4	≥2	≥2
GAA	lysosomal alpha-glucosidase-like	11.06	8	29.4	303	105.8	6.0	≥2	≥2
MAN2B1	lysosomal alpha-mannosidase	4.66	4	5.6	114	113.9	7.9	≥2	≥2
LOXL3	lysyl oxidase homolog 3	8.92	6	16.6	108	83.1	6.9	1	≥2
MIF	macrophage migration inhibitory factor-like	17.39	2	2.8	136	12.4	7.3	≥2	≥2
CAPG	Macrophage-capping protein	20.63	5	20.0	196	38.7	6.6	≥2	1

MDH1	malate dehydrogenase, cytoplasmic-like	17.37	5	11.7	187	36.4	6.6	≥2	≥2
MAMDC2	MAM domain-containing protein 2	3.50	2	6.7	42	77.5	5.3	≥2	1
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	7.93	3	8.1	54	56.0	6.5	≥2	≥2
MMP19	matrix metalloproteinase-19	34.29	12	42.0	508	58.9	7.9	≥2	≥2
MMP9	matrix metalloproteinase-9	22.11	14	50.2	579	78.8	5.9	≥2	≥2
TIMP1	metalloproteinase inhibitor 1-like	43.84	8	35.1	416	22.4	8.5	≥2	≥2
TIMP2	Metalloproteinase inhibitor 2	27.23	5	16.0	148	21.5	7.5	≥2	≥2
CLNS1A	methylosome subunit pICln	5.51	1	3.7	57	26.1	4.1	1	1
MSN	moesin	14.49	8	24.0	153	66.5	6.3	≥2	≥2
PAICS	multifunctional protein ADE2	5.41	2	5.5	55	47.1	6.9	≥2	≥2
MINPP1	Multiple inositol polyphosphate phosphatase 1	5.71	2	5.0	44	40.3	6.4	≥2	1
MYBBP1A	Myb-binding protein 1A	1.29	1	3.6	74	105.1	9.1	1	1
MYL6	Myosin light polypeptide 6	17.11	2	7.6	100	17.3	4.6	≥2	≥2
MYH9	myosin-9	1.49	2	7.3	77	217.6	5.6	≥2	≥2
MTPN	myotrophin-like	17.53	1	4.4	69	10.4	6.5	1	1
GALNS	N-acetylgalactosamine-6-sulfatase	2.07	1	3.3	54	54.0	6.9	1	1
GALNT7	N-acetylgalactosaminyltransferase 7	2.14	1	4.0	70	69.7	7.5	1	1
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma-like	18.24	5	16.9	85	34.2	6.9	≥2	≥2
GNS	N-acetylglucosamine-6-sulfatase	11.60	5	14.9	117	53.7	6.9	≥2	≥2
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	7.95	3	9.4	86	47.5	7.5	≥2	≥2
NAA15	N-alpha-acetyltransferase 15, NatA auxiliary subunit	1.10	1	2.7		95.3	7.0	1	1
NACA	nascent polypeptide-associated complex subunit alpha	26.51	5	28.1	279	23.4	4.6	≥2	≥2
UBE2M	NEDD8-conjugating enzyme Ubc12	5.42	1	2.8		22.9	4.7	1	1
NEO1	Neogenin	2.49	3	9.6	74	154.4	6.6	≥2	≥2
NTN4	Netrin-4	8.36	4	15.5	138	64.0	8.1	≥2	≥2
NENF	Neudesin	17.95	2	2.7	45	12.9	4.9	≥2	1
NCAM1	neural cell adhesion molecule 1	10.25	10	47.4	551	122.1	4.8	≥2	≥2
NRP1	neuropilin-1	3.90	2	8.0	108	103.0	5.9	≥2	≥2
SERPINI1	neuroserpin-like	7.80	3	12.5	113	46.6	4.9	≥2	≥2
NHP2L1	NHP2-like protein 1	16.44	1	2.6	67	8.0	7.9	1	1
NID1	Nidogen-1	16.74	9	35.2	323	79.0	4.9	≥2	≥2
NONO	Non-POU domain-containing octamer-binding protein	7.67	4	12.2	80	69.6	5.2	≥2	≥2
SCP2	non-specific lipid-transfer protein	3.84	2	5.9	58	58.9	7.4	≥2	≥2
SGSH	N-sulphoglucosamine sulphohydrolase-like	9.96	4	11.3	117	56.5	6.5	1	≥2

NASP	nuclear autoantigenic sperm protein-like	3.38	3	5.6	78	83.4	4.4	≥2	≥2
NUDC	Nuclear migration protein nudC	7.80	2	8.0	80	32.8	6.0	≥2	≥2
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	6.36	1	2.3		19.3	5.5	1	1
YBX1	nuclease-sensitive element-binding protein 1	29.67	5	24.6	455	38.3	10.2	≥2	≥2
NUCB1	Nucleobindin-1	71.31	8	29.9	348	13.8	4.8	≥2	≥2
NUCB2	nucleobindin-2-like	33.33	14	43.9	432	50.3	5.1	≥2	≥2
NCL	nucleolin	15.22	9	36.9	351	82.3	4.7	≥2	≥2
NPM1	Nucleophosmin	23.21	4	11.3	99	31.0	4.7	≥2	≥2
NME2	nucleoside diphosphate kinase B	45.39	5	7.4	83	17.3	8.0	≥2	≥2
NAP1L4	Nucleosome assembly protein 1-like 4	8.12	2	7.3	100	39.4	4.7	≥2	≥2
OLFML2B	olfactomedin-like protein 2B	6.27	4	7.5	81	83.5	4.9	1	≥2
OLFML1	Olfactomedin-like protein 3	10.59	5	11.3	182	45.9	6.2	≥2	≥2
NIT2	omega-amidase NIT2	3.62	1	2.8	43	30.5	7.4	1	1
OSTF1	osteoclast-stimulating factor 1-like	3.74	1	2.3	42	23.7	5.7	1	1
OAF	out at first protein homolog	26.24	6	20.8	258	29.7	8.3	≥2	≥2
PPT1	palmitoyl-protein thioesterase 1-like	17.97	5	16.3	121	34.5	7.9	≥2	≥2
VNN1	pantetheinase	5.27	2	7.8	57	56.7	5.6	≥2	≥2
PDLIM1	PDZ and LIM domain protein 1-like	4.86	1	3.4	63	35.9	7.1	1	1
PTX3	pentraxin-related protein PTX3	13.39	5	15.2	100	42.2	5.4	≥2	≥2
PPIA	Peptidyl-prolyl cis-trans isomerase A	18.75	3	75.6	787	14.1	6.8	≥2	≥2
PPIB	peptidyl-prolyl cis-trans isomerase B-like	48.61	11	65.2	538	23.6	9.6	≥2	≥2
PPIC	Peptidyl-prolyl cis-trans isomerase C	22.09	3	15.3	167	18.0	8.1	≥2	≥2
FKBP1A	peptidyl-prolyl cis-trans isomerase FKBP1A	24.05	2	7.8	90	8.8	7.4	≥2	≥2
FKBP4	peptidyl-prolyl cis-trans isomerase FKBP4	16.05	6	21.9	112	48.6	5.7	≥2	≥2
FKBP9	peptidyl-prolyl cis-trans isomerase FKBP9-like	6.49	3	9.2		63.0	5.1	≥2	≥2
PLIN4	perilipin-4-like	14.55	3	8.0	71	184.1	8.4	≥2	≥2
PXDN	peroxidasin homolog	21.22	25	99.3	969	165.3	7.0	≥2	≥2
PRDX1	Peroxiredoxin-1	63.32	10	39.4	333	22.2	7.7	≥2	≥2
PRDX4	peroxiredoxin-4-like	9.68	3	16.8	68	38.8	8.4	1	≥2
PEBP1	Phosphatidylethanolamine-binding protein 1	53.48	6	12.1	314	20.9	7.1	≥2	≥2
PGM1	Phosphoglucomutase-1	7.17	3	8.5	181	62.8	5.9	≥2	≥2
PGM2	phosphoglucomutase-2	1.61	1	3.0	42	69.0	6.3	1	1
PGK1	phosphoglycerate kinase 1	31.65	10	26.3	247	44.5	7.9	≥2	≥2
PGAM1	Phosphoglycerate mutase 1	26.97	5	12.7	143	20.2	8.1	≥2	≥2

PLTP	phospholipid transfer protein	34.89	15	67.8	701	54.3	6.7	≥2	≥2
PSAT1	Phosphoserine aminotransferase	17.80	4	9.9	149	33.9	8.0	≥2	≥2
PSPH	phosphoserine phosphatase	12.89	3	5.2	41	25.0	5.5	≥2	≥2
SERPINF1	Pigment epithelium-derived factor	36.21	3	17.6	137	6.7	5.3	≥2	≥2
PIR	pirin-like	6.21	2	5.0		32.1	6.5	≥2	≥2
SERPINE1	Plasminogen activator inhibitor 1	12.96	3	6.2	71	30.7	6.2	≥2	≥2
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.91	2	5.6	66	44.1	10.3	≥2	1
PLS3	plastin-3	11.59	5	14.6	190	70.8	5.7	≥2	≥2
ASPG	platelet-activating factor acetylhydrolase-like	27.75	7	20.5	232	39.1	8.4	≥2	≥2
PDGFC	platelet-derived growth factor C	4.64	2	4.7		38.7	6.8	≥2	≥2
PLEC	plectin	2.67	10	27.7	200	533.6	5.9	≥2	≥2
PCBP2	Poly(rC)-binding protein 2	11.84	3	7.5	45	33.8	8.0	≥2	1
PABPC1	Polyadenylate-binding protein 1	10.80	4	15.2	40	62.7	9.6	≥2	≥2
PABPN1	Polyadenylate-binding protein 2	4.10	1	3.4	40	28.1	9.6	1	1
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	2.06	1	2.3		60.9	7.9	1	1
PTBP1	Polypyrimidine tract-binding protein 1	5.30	3	7.9		56.7	9.4	≥2	≥2
PFDN1	prefoldin subunit 1-like	9.02	1	3.4	78	14.2	6.8	1	1
PFDN2	prefoldin subunit 2-like	22.73	3	8.6	103	16.7	6.6	≥2	≥2
PFDN4	Prefoldin subunit 4	12.90	1	3.0	53	10.6	4.4	1	1
PRPF8	Pre-mRNA-processing-splicing factor 8	2.65	1	2.7	51	30.1	7.2	1	1
PCYOX1	prenylcysteine oxidase	5.54	2	6.8	77	56.5	5.9	1	≥2
DDX5	probable ATP-dependent RNA helicase DDX5	4.07	2	6.8	68	69.2	8.9	≥2	≥2
PCOLCE	procollagen C-endopeptidase enhancer 1	56.20	17	64.9	896	50.4	7.9	≥2	≥2
PCOLCE2	Procollagen C-endopeptidase enhancer 2	17.86	6	15.4	162	40.3	9.3	≥2	≥2
Q8NBJ5	procollagen galactosyltransferase 1	4.38	2	6.2	85	65.4	7.0	≥2	≥2
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	3.95	3	9.5	76	75.9	6.2	≥2	≥2
PLOD2	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 2	2.39	1	3.8	53	67.1	7.5	1	1
PFN1	Profilin-1	45.45	2	5.9	44	6.0	9.9	≥2	≥2
PFN2	Profilin-2	15.38	1	4.0	65	9.8	9.2	1	1
PDCD6IP	programmed cell death 6-interacting protein-like	2.77	2	6.5	79	95.9	6.4	≥2	≥2
PDCD5	programmed cell death protein 5	8.46	1	2.5		14.9	6.9	1	1
PA2G4	proliferation-associated protein 2G4-like	26.14	9	24.8	186	43.7	6.7	≥2	≥2
LRP1	prolow-density lipoprotein receptor-related protein 1	0.46	2	8.3	43	504.3	5.4	1	≥2
P4HA1	Prolyl 4-hydroxylase subunit alpha-1	7.69	3	10.3	144	58.0	5.7	≥2	≥2

PTGES3	prostaglandin E synthase 3-like	8.07	1	4.0	85	18.9	4.6	1	1
PTGR1	prostaglandin reductase 1-like	17.02	6	12.8	128	35.7	7.2	≥2	≥2
PSME1	Proteasome activator complex subunit 1	40.77	5	13.5	180	14.6	6.6	≥2	≥2
PSME3	Proteasome activator complex subunit 3	10.28	1	7.3	107	12.0	8.3	1	1
PSMA1	proteasome subunit alpha type-1	12.17	3	6.4	42	29.5	6.5	≥2	≥2
PSMA2	proteasome subunit alpha type-2	15.38	2	7.5	64	25.9	7.4	≥2	≥2
PSMA3	proteasome subunit alpha type-3	17.65	4	11.8	121	28.4	5.3	≥2	≥2
PSMA4	proteasome subunit alpha type-4	14.18	3	10.3	156	29.5	7.7	≥2	≥2
PSMA5	proteasome subunit alpha type-5	17.43	3	5.3	44	26.4	4.8	≥2	≥2
PSMA7	Proteasome subunit alpha type-7	18.87	3	9.1	148	23.8	8.5	≥2	≥2
PSMB1	Proteasome subunit beta type-1	10.00	1	4.5	78	15.6	8.1	1	1
PSMB3	Proteasome subunit beta type-3	26.92	1	3.5	79	5.7	9.0	1	1
PSMB4	proteasome subunit beta type-4	3.41	1		42	29.2	5.5	1	1
PSMB5	proteasome subunit beta type-5	8.75	2	6.6	77	28.7	7.0	≥2	≥2
PSMB6	proteasome subunit beta type-6-like	17.95	4	9.2	140	24.7	5.1	≥2	≥2
PSMB7	proteasome subunit beta type-7	7.22	2	5.2	40	29.9	8.0	≥2	≥2
PSMB8	Proteasome subunit beta type-8	4.82	1	2.8	55	25.5	7.1	1	1
CREG1	protein CREG1	4.55	1	3.1		24.1	8.0	1	1
CYR61	protein CYR61	17.72	8	36.3	231	41.5	8.1	≥2	≥2
P4hb	Protein disulfide-isomerase	34.78	6	17.2	162	21.1	4.6	≥2	≥2
PDIA3	Protein disulfide-isomerase A3	26.35	11	44.3	360	50.0	5.7	≥2	≥2
PDIA4	protein disulfide-isomerase A4	11.99	6	17.1	224	72.5	5.2	≥2	≥2
PDIA6	Protein disulfide-isomerase A6	28.57	5	19.2	123	28.4	4.9	≥2	≥2
PARK7	protein DJ-1	26.46	3	17.6	205	19.9	6.8	≥2	≥2
FAM3C	protein FAM3C-like	30.40	6	22.9	257	24.7	8.3	≥2	≥2
PPP1R7	Protein phosphatase 1 regulatory subunit 7	15.52	1	2.4		6.9	6.7	1	1
PPM1F	protein phosphatase 1F	4.46	1	3.9	51	49.6	5.2	1	1
PPM1G	Protein phosphatase 1G	7.66	1	4.2		54.0	4.3	1	1
RCC2	Protein RCC2	3.42	1	2.2	47	31.9	7.0	1	1
S100A10	protein S100-A10	27.84	2	2.8	44	11.2	6.8	≥2	≥2
S100A11	protein S100-A11	26.00	2	6.1	74	11.2	7.1	≥2	≥2
S100A13	Protein S100-A13	39.80	5	10.5	64	11.2	5.3	≥2	≥2
S100A6	protein S100-A6	16.85	2	7.3	98	10.0	5.5	≥2	≥2
SET	Protein SET	15.54	2	5.6	110	17.0	4.0	≥2	≥2

SHISA5	protein shisa-5-like	12.81	3	15.5	62	25.9	6.5	1	≥2
FAT1	protocadherin Fat 1-like	0.26	1	3.1	47	506.4	5.0	1	1
PNP	Purine nucleoside phosphorylase	7.42	2	8.7	85	31.4	6.7	≥2	≥2
NPEPPS	puromycin-sensitive aminopeptidase	2.12	2	5.0		105.6	6.1	≥2	≥2
PLBD2	putative phospholipase B-like 2	20.17	8	27.5	299	65.5	6.3	≥2	≥2
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.51	1	2.7		82.8	7.1	1	1
RBM3	Putative RNA-binding protein 3	20.51	2		68	17.0	8.4	≥2	1
PDXK	Pyridoxal kinase	12.81	2	3.1	111	27.0	5.5	≥2	≥2
GDI2	Rab GDP dissociation inhibitor beta	14.38	6	10.5	112	50.5	6.5	≥2	1
RDX	radixin	7.03	2	18.1	112	68.5	6.3	≥2	≥2
RANBP1	ran-specific GTPase-activating protein-like	14.09	3	9.3	106	25.2	5.2	≥2	≥2
G3BP1	Ras GTPase-activating protein-binding protein 1	3.76	1	3.0	43	50.4	5.6	≥2	1
IQGAP1	ras GTPase-activating-like protein IQGAP1	1.93	3	9.2	116	188.8	6.5	1	≥2
RSU1	ras suppressor protein 1	2.53	1		46	31.5	8.6	1	1
PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	0.87	2	5.7	47	251.3	4.8	≥2	≥2
ATP6AP2	Renin receptor	13.33	3	9.1	110	33.8	5.2	≥2	≥2
RPA3	replication protein A 14 kDa subunit	9.09	1	3.4	59	13.6	4.8	1	1
ALDH1A1	Retinal dehydrogenase 1	4.59	2	6.2	57	47.5	6.8	≥2	≥2
RARRES2	Retinoic acid receptor responder protein 2	20.14	5	21.3	54	16.4	9.1	≥2	≥2
SCPEP1	retinoid-inducible serine carboxypeptidase	20.88	7	21.6	263	51.2	5.5	≥2	≥2
ARHGDIA	rho GDP-dissociation inhibitor 1	34.31	6	21.1	184	23.4	5.2	≥2	≥2
RNASE4	ribonuclease 4	49.66	6	23.1	162	17.0	9.3	≥2	≥2
RNH1	ribonuclease inhibitor-like	10.53	4	17.3	155	50.0	4.8	≥2	≥2
RNASET2	ribonuclease T2-like	27.41	5	16.5	150	29.5	6.7	≥2	≥2
RPIA	Ribose-5-phosphate isomerase	11.73	2	6.6	70	19.8	7.3	≥2	≥2
RBM8A	RNA-binding protein 8A	11.11	1	4.1	51	19.5	5.7	1	1
EWSR1	RNA-binding protein EWS	2.14	1	3.4	60	68.4	9.3	1	1
FUS	RNA-binding protein FUS	19.51	2	8.5		21.2	10.0	≥2	≥2
RUVBL1	ruvB-like 1	2.85	1	2.2	42	50.2	6.4	1	1
SARNP	SAP domain-containing ribonucleoprotein-like	12.55	2	6.0	102	25.9	9.2	≥2	≥2
SEPP1	Selenoprotein P	5.82	1	3.6	53	21.8	9.1	1	1
SEMA3B	semaphorin-3B	28.57	17	60.2	501	83.0	8.4	≥2	≥2
SEMA3C	semaphorin-3C	22.39	13	50.5	473	83.6	8.6	≥2	≥2
SEMA3E	semaphorin-3E	10.30	7	19.4	215	89.5	7.8	≥2	≥2

SEMA4B	semaphorin-4B	4.96	4	11.8	59	91.4	7.8	≥2	≥2
SEPT11	septin-11-like	4.47	2	6.2	57	49.0	7.0	≥2	≥2
SEPT9	septin-9	3.71	2	6.1	42	63.7	8.3	≥2	≥2
HTRA1	Serine protease HTRA1	38.14	8	16.5	313	34.1	7.2	≥2	1
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	3.93	2	5.4	60	59.0	5.1	≥2	≥2
STRAP	Serine-threonine kinase receptor-associated protein	8.41	2	5.0	71	34.1	4.9	≥2	≥2
SERPINH1	Serpin H1	5.52	2	5.5	51	46.5	8.7	≥2	≥2
ESD	S-formylglutathione hydrolase-like	12.06	2	8.6	79	31.3	6.9	≥2	≥2
SH3BGRL3	SH3 domain-binding glutamic acid-rich protein 3	31.18	2		77	10.4	4.8	≥2	≥2
SH3BGRL2	SH3 domain-binding glutamic acid-rich-like protein-like	67.54	5	12.0	236	12.7	5.1	≥2	≥2
NANS	sialic acid synthase	2.79	1		56	40.2	6.9	1	1
NEU1	Sialidase-1	13.20	4	11.8	144	39.0	5.5	≥2	≥2
SGTA	small glutamine-rich tetratricopeptide repeat-containing protein alpha-like	3.18	1	3.0	48	34.1	5.0	1	1
SNRPD1	small nuclear ribonucleoprotein Sm D1	27.73	2	2.3	89	13.3	11.6	≥2	≥2
SNRPD2	Small nuclear ribonucleoprotein Sm D2	16.95	2	6.0	52	13.5	9.8	≥2	1
SNRPD3	small nuclear ribonucleoprotein Sm D3	24.60	2	7.9	72	13.8	9.0	≥2	≥2
SNRPB	Small nuclear ribonucleoprotein-associated protein B	13.45	2	2.6	50	22.8	10.9	≥2	≥2
MTAP	S-methyl-5'-thioadenosine phosphorylase	13.07	3	5.3	44	31.0	7.1	≥2	≥2
CANT1	soluble calcium-activated nucleotidase 1	12.50	4	12.5	108	45.2	6.6	≥2	≥2
SORD	sorbitol dehydrogenase	6.44	2	2.4	47	38.3	7.7	≥2	≥2
SPARC	SPARC	19.68	7	21.1	197	28.2	4.9	≥2	≥2
SPTAN1	Spectrin alpha chain, brain	4.57	9	23.7	163	258.7	5.4	≥2	≥2
SPTBN1	Spectrin beta chain, brain 1	4.51	3	4.9	48	94.5	5.9	≥2	≥2
SMPD1	Sphingomyelin phosphodiesterase	7.93	4	9.3	121	66.2	7.0	≥2	≥2
DDX39B	Spliceosome RNA helicase BAT1	7.48	3	12.8	159	49.0	5.7	≥2	1
SFPQ	splicing factor, proline- and glutamine-rich	17.78	5	19.9	131	49.4	7.9	≥2	≥2
STC2	stanniocalcin-2-like	7.74	2	6.2		32.6	7.2	≥2	≥2
Q7KZF4	staphylococcal nuclease domain-containing protein 1	3.16	2	7.0	86	99.6	7.1	≥2	≥2
STIP1	Stress-induced-phosphoprotein 1	9.02	5	23.0	107	62.6	6.8	≥2	≥2
SUMF1	Sulfatase-modifying factor 1	5.28	1	2.5		31.7	6.3	1	1
Psap	sulfated glycoprotein 1	32.44	16	73.0	566	65.7	5.5	≥2	≥2
SBSN	suprabasin	30.15	12	48.8	383	63.3	7.4	≥2	≥2
SRPX	Sushi repeat-containing protein SRPX	9.12	3	8.5	76	37.9	8.4	≥2	≥2

O60687	Sushi repeat-containing protein SRPX2	4.24	1	3.2		32.2	7.8	1	1
SDC4	syndecan-4-like	12.38	2	5.6	87	22.2	4.6	≥2	≥2
TLN1	Talin-1	1.68	3	8.0	82	199.0	5.3	1	≥2
ACP5	tartrate-resistant acid phosphatase type 5	15.45	4	17.9	181	37.1	8.8	≥2	≥2
CCT2	T-complex protein 1 subunit beta-like	12.90	6	19.9	178	57.5	6.5	≥2	≥2
CCT4	T-complex protein 1 subunit delta	11.50	5	17.5	127	58.1	8.0	≥2	≥2
CCT7	T-complex protein 1 subunit eta	11.62	5	14.3	165	54.9	7.4	≥2	≥2
CCT3	T-complex protein 1 subunit gamma-like	18.35	8	33.6	383	60.6	6.6	≥2	≥2
CCT6A	T-complex protein 1 subunit zeta	10.73	4	12.9	113	57.9	6.9	≥2	≥2
TXN	thioredoxin	28.92	3	12.7	127	9.1	4.7	≥2	≥2
THBS1	thrombospondin-1	39.83	44	240.4	2160	129.6	4.9	≥2	≥2
THBS3	thrombospondin-3	5.96	5	15.0	72	104.1	4.6	≥2	≥2
FUCA1	tissue alpha-L-fucosidase	19.91	7	19.3	208	53.3	6.5	≥2	≥2
PLAT	tissue-type plasminogen activator	6.98	3	9.0	86	63.0	8.2	≥2	≥2
TOR1B	Torsin-1B	6.96	1	2.9		18.3	6.9	1	1
TALDO1	transaldolase	15.73	5	15.8	120	37.5	7.0	≥2	≥2
BTF3	transcription factor BTF3	17.90	2	2.7	65	17.7	6.9	≥2	≥2
TRIM28	Transcription intermediary factor 1-beta	3.74	1	4.1	44	58.0	6.3	1	1
TAGLN2	transgelin-2-like	40.20	7	35.7	348	22.4	8.6	≥2	≥2
VCP	Transitional endoplasmic reticulum ATPase	5.07	10	30.4	151	237.5	6.0	≥2	≥2
TKTL1	transketolase-like	27.13	13	34.5	420	67.7	7.6	≥2	≥2
TPT1	Translationally-controlled tumor protein	14.08	2	10.0	55	15.9	5.0	≥2	≥2
TSN	Translin	3.54	1	2.2		25.9	8.0	1	1
TMEM132A	transmembrane protein 132A	4.40	3	8.8	70	110.0	5.3	1	≥2
GART	Trifunctional purine biosynthetic protein adenosine-3	3.37	3	10.1		107.5	6.8	≥2	≥2
TPI1	Triosephosphate isomerase	25.33	3	11.7	139	16.4	8.2	≥2	≥2
TPP1	Tripeptidyl-peptidase 1	30.20	11	26.7	416	61.5	6.5	≥2	1
TUBA1A	Tubulin alpha-1A chain	19.29	6	21.6	250	50.1	5.1	≥2	≥2
TBCA	Tubulin-specific chaperone A	38.10	3	2.3	80	9.9	4.7	≥2	≥2
TTLL12	tubulin--tyrosine ligase-like protein 12	5.31	3	10.1	58	74.1	5.6	≥2	≥2
TINAG	tubulointerstitial nephritis antigen	28.60	9	35.2	367	52.5	7.1	≥2	≥2
TNFRSF21	tumor necrosis factor receptor superfamily member 21	3.36	2	5.4		71.5	7.5	≥2	≥2
TWF1	twinfilin-1	2.57	1	2.8	62	40.0	6.4	1	1
AXL	tyrosine-protein kinase receptor UFO	1.34	1	3.2	58	90.9	5.9	1	1

YARS	Tyrosyl-tRNA synthetase, cytoplasmic	4.36	2	5.1		59.2	7.0	≥2	≥2
SNRPA1	U2 small nuclear ribonucleoprotein A'	11.58	1	2.2		10.0	8.5	1	1
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	1.82	2	7.1	52	158.1	6.0	1	≥2
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	14.56	2	7.3	72	18.1	5.1	≥2	1
UCHL5	ubiquitin carboxyl-terminal hydrolase isozyme L5	3.34	1	2.7	41	37.6	5.4	1	1
UFD1L	ubiquitin fusion degradation protein 1 homolog	4.23	1	2.3		34.4	6.7	1	1
Otub1	Ubiquitin thioesterase OTUB1	9.96	2	6.7	93	28.0	5.3	≥2	≥2
UBAP2L	Ubiquitin-associated protein 2-like	1.60	1		43	106.1	7.0	≥2	1
UBE2N	Ubiquitin-conjugating enzyme E2 N	17.75	2	7.2	44	18.6	6.1	1	≥2
UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	13.01	2	5.5	57	16.5	8.6	≥2	1
UBA1	ubiquitin-like modifier-activating enzyme 1-like	8.60	8	22.2	251	117.6	5.7	≥2	≥2
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2-like	5.79	2	3.8	97	46.2	9.2	≥2	≥2
UGGT1	UDP-glucose:glycoprotein glucosyltransferase 1	2.04	2	2.8	75	151.4	5.7	≥2	≥2
UXS1	UDP-glucuronic acid decarboxylase 1	13.65	4	13.1	50	43.3	7.7	1	≥2
CMPK1	UMP-CMP kinase-like	7.51	1	3.8		19.9	5.4	1	1
D17Wsu104e	UPF0556 protein C19orf10 homolog	19.28	3	7.9	58	18.0	6.3	≥2	≥2
RAD23B	UV excision repair protein RAD23 homolog B-like	4.43	2	5.9		51.7	5.9	≥2	≥2
VPS35	vacuolar protein sorting-associated protein 35	3.11	2	5.8	41	96.0	5.5	≥2	≥2
VEGFA	Vascular endothelial growth factor A	3.29	1	2.7		24.6	8.1	1	1
VAPB	vesicle-associated membrane protein-associated protein B	4.94	1	4.2	82	26.8	7.8	1	1
NSF	Vesicle-fusing ATPase	4.57	3	9.4	74	82.5	7.1	≥2	1
LMAN2	vesicular integral-membrane protein VIP36-like	5.62	2	6.1	53	40.2	6.9	≥2	≥2
VIM	vimentin	59.74	28	92.0	763	44.5	4.8	≥2	≥2
PROS1	vitamin K-dependent protein S	6.22	4	11.8	114	74.7	5.7	≥2	≥2
VWA5A	von Willebrand factor A domain-containing protein 5A	1.89	1	2.4		58.9	4.7	1	1
ATP6V1B2	V-type proton ATPase subunit B, brain isoform	2.24	1	2.3		49.8	5.3	1	1
ATP6AP1	V-type proton ATPase subunit S1	8.62	3	8.9	79	48.9	6.0	≥2	≥2
WDR1	WD repeat-containing protein 1	7.82	4	15.2	164	58.8	7.1	≥2	≥2

Table 3.3.57: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being unique to the NCBI database.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component-like	2.26	2	6.3	78	109.4	5.0
YWHAB	14-3-3 protein beta/alpha isoform 2	20.08	4	20.5	158	27.8	4.8
YWHAE	14-3-3 protein epsilon-like, partial	60.95	6	19.2	224	11.9	5.8
YWHAG	14-3-3 protein gamma	18.91	2	8.3	94	23.0	5.0
PSMC6	26S protease regulatory subunit 10B	2.83	1	3.2		44.1	7.5
PSMD3	26S proteasome non-ATPase regulatory subunit 3-like, partial	8.62	1	3.4	57	20.0	9.6
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	2.5		42.3	8.0
PPID	40 kDa peptidyl-prolyl cis-trans isomerase	4.09	1	2.4		24.0	6.0
RPS19	40S ribosomal protein S19-like, partial	31.62	5	14.2	120	15.1	10.5
RPS23	40S ribosomal protein S23-like	7.75	1	2.8		15.9	9.9
FAU	40S ribosomal protein S30	16.95	1	2.6		6.6	12.1
RPS3A	40S ribosomal protein S3a-like, partial	18.81	3	8.8	53	11.4	9.9
RPS4X	40S ribosomal protein S4, X isoform-like	13.74	3	7.6	74	29.2	10.3
Rps8	40S ribosomal protein S8-like, partial	6.75	1	12.7	40	19.1	10.8
RPL11	60S ribosomal protein L11-like, partial	18.18	1	3.3	54	8.8	10.4
RPL15	60S ribosomal protein L15-like, partial	15.15	3	8.6	61	23.5	11.6
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	4.96	3	8.0	48	77.3	7.6
ADAMTS4	A disintegrin and metalloproteinase with thrombospondin motifs 4	2.93	1		42	95.6	8.2
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	8.41	11	39.2	514	177.6	5.8
ACTA1	actin, alpha skeletal muscle	24.67	1	76.7	461	42.0	5.4
ACTA1	actin, alpha skeletal muscle A-like	12.64	1	52.5	124	9.7	8.5
ACTB	actin, cytoplasmic 1	45.33	5	52.4	627	41.7	5.4
ACTG1	actin, cytoplasmic 2-like, partial	46.26	10	64.5	531	38.5	5.4
ACTG2	actin, gamma-enteric smooth muscle-like isoform 2	24.80	1	42.5	495	41.7	6.0
ARPC4	actin-related protein 2/3 complex subunit 4-like	13.02	2	6.1	69	19.8	8.4
ARPC5	actin-related protein 2/3 complex subunit 5-like	11.88	1	3.7	84	10.8	9.8
ACTR3B	Actin-related protein 3B	3.03	1	2.3		41.7	6.6
CAP1	adenylyl cyclase-associated protein 1-like isoform 1	10.13	4	12.8	163	51.5	7.3
ADM	ADM	13.59	1		40	20.6	10.2
ARF1	ADP-ribosylation factor 1-like, partial	23.08	1	4.0	91	7.3	5.3
AGRN	agrin-like isoform 1	5.40	7	24.7	226	217.0	5.8

AGRN	agrin-like isoform 2	3.67	5	15.7	83	205.7	6.0
AKR1A1	alcohol dehydrogenase	19.14	6	20.3	128	36.5	7.1
ALDH16A1	aldehyde dehydrogenase family 16 member A1 isoform 2	1.60	1	3.1	51	79.9	7.1
Aldh1a7	Aldehyde dehydrogenase, cytosolic 1	2.17	1	2.6		45.4	6.6
AKR1B10	Aldo-keto reductase family 1 member B10	6.14	1	5.5	45	31.5	9.1
App	Alzheimer's amyloid beta protein precursor	17.72	1	11.7	428	8.5	7.4
ABP1	amiloride-sensitive amine oxidase	1.57	1	2.8		79.8	6.6
AGT	Angiotensinogen	5.66	2	6.4		51.7	6.6
ANXA2	annexin A2-like, partial	59.03	10	47.0	533	25.4	6.0
ANXA6	annexin A6 isoform 2	2.97	2	5.9	56	76.1	5.6
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	1.21	1	2.4		72.1	6.1
DDX39A	ATP-dependent RNA helicase DDX39	4.25	2	8.5	90	48.7	5.8
B2M	beta-2-microglobulin precursor	36.13	5	25.6	187	13.8	7.4
ACTR1B	beta-centractin	2.66	1	3.3		42.2	6.7
UPB1	beta-ureidopropionase-like	4.58	1	3.9		44.3	7.1
PRSS22	brain-specific serine protease 4-like	13.46	5	20.1	147	41.2	7.3
BAZ2B	Bromodomain adjacent to zinc finger domain protein 2B	0.54	1	2.3		205.6	6.1
CAST	calpastatin	3.38	2	7.2	61	82.8	5.3
PRKACA	cAMP-dependent protein kinase catalytic subunit alpha-like isoform 1	2.65	1	2.4		39.4	8.8
CHST11	carbohydrate sulfotransferase 11	2.27	1	2.2		41.6	8.9
CHST14	carbohydrate sulfotransferase 14-like	3.19	1	3.4	56	43.0	9.2
CBR1	Carbonyl reductase	16.18	4	7.8	128	26.7	7.8
CCL2	c-C motif chemokine 2-like	27.27	5	4.6	160	15.8	9.2
CCL7	c-C motif chemokine 7-like	23.71	2	6.5		11.0	8.9
N/A	CCHC-type zinc finger	7.93	1	3.9		18.1	7.4
CD109	CD109 antigen isoform 1	7.03	8	22.2	157	152.9	6.2
CD109	CD109 antigen isoform 2	5.61	7	21.7	191	161.8	6.2
CD44	CD44 antigen isoform 5	5.85	2	8.5	116	39.4	5.9
CD81	CD81 antigen-like isoform 1	8.47	1	3.9	52	25.8	5.5
P21926	CD9 antigen	6.29	1	3.0	41	17.7	6.7
CHD6	Chromodomain-helicase-DNA-binding protein 6	1.72	1	2.3		74.8	5.7
CLTB	Clathrin light chain B	6.62	1	2.3		17.4	5.5
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	21.15	4	13.5	163	23.9	9.6
COPA	coatomer subunit alpha isoform 1	0.82	1	2.8		138.2	7.6
COPB1	Coatomer subunit beta'	1.26	1	2.9		89.4	5.5
CCDC58	coiled-coil domain-containing protein 58-like	7.64	1	2.6	49	16.6	7.3

COL3A1	collagen alpha-1(III) chain-like isoform 1	31.86	31	138.0	1294	139.0	6.6
C1QTNF5	complement C1q tumor necrosis factor-related protein 5-like	9.05	2	4.7	47	25.3	6.4
CFH	complement factor H-like, partial	6.22	3	9.2	40	72.7	6.7
ATOX1	copper transport protein ATOX1-like	19.12	1	3.8	61	7.4	7.2
Cul5	cullin-5-like isoform 2	1.28	1	2.3		90.9	7.9
CXCL3	C-X-C motif chemokine 3 precursor	9.90	1	3.3		11.0	8.8
CRIM1	Cysteine-rich motor neuron 1 protein	3.49	1	2.9		37.6	4.9
CRELD1	cysteine-rich with EGF-like domain protein 1-like	2.86	1	2.2		45.7	5.1
CKAP5	cytoskeleton-associated protein 5-like	0.59	1	5.5	54	225.4	7.8
DDX17	DEAD (Asp-Glu-Ala-Asp) box polypeptide 17, isoform CRA_a	7.67	4	13.2	122	72.6	8.7
DENR	Density-regulated protein	5.26	1	2.4		17.2	6.8
DPT	dermatopontin-like	13.93	2	2.7	68	24.0	4.9
SAT2	diamine acetyltransferase 2-like	4.14	1		46	19.4	7.4
DPYSL2	dihydropyrimidinase-related protein 2-like	11.01	4	12.9	76	62.2	6.4
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	2.92	2	8.0		106.2	7.5
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	19.67	1		45	7.2	9.1
EFEMP1	EGF-containing fibulin-like extracellular matrix protein 1, partial	34.55	12	53.9	436	48.9	4.9
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2 precursor	13.54	1	15.7	75	49.4	4.9
EEF1D	elongation factor 1-delta-like isoform 1	17.08	3	8.5	114	31.3	5.1
EEF1D	elongation factor 1-delta-like isoform 2	13.41	3	7.3	132	30.7	5.0
EEF1D	elongator complex protein 2-like isoform 3	1.70	1	3.3		85.4	5.9
EMILIN1	EMILIN-1	17.80	15	57.2	651	107.2	5.4
env	Envelope glycoprotein	2.28	1	4.2	42	73.5	7.7
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.71	1	2.2		65.3	6.3
EIF3C	eukaryotic translation initiation factor 3 subunit C, partial	3.44	2	7.1		84.0	5.5
EIF3E	Eukaryotic translation initiation factor 3 subunit E	3.80	1	2.5		30.7	6.9
EIF3K	Eukaryotic translation initiation factor 3 subunit K	6.32	1	2.9		19.9	4.8
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.76	2	7.4		174.8	5.4
EIF4E	Eukaryotic translation initiation factor 4E	9.40	1	2.6	64	13.4	8.3
SSRP1	FACT complex subunit SSRP1-like isoform 1	1.55	1	2.5		81.0	6.9
FDPS	Farnesyl pyrophosphate synthetase	5.87	2	8.0	49	43.2	7.8
FBXW7	F-box/WD repeat-containing protein 7 isoform 1	2.07	1	2.4		70.5	8.4
FN1	fibronectin isoform 2	12.89	22	58.4	488	262.9	5.9
N/A	fibronectin isoform 3	2.64	4	12.4	77	250.4	6.2
FNDC8	fibronectin type III domain-containing protein 8-like	3.11	1	2.2		35.9	6.3
FLNB	filamin-B isoform 3	5.39	10	30.1	215	275.1	5.7

FKBP4	FK506-binding protein 4	8.03	3	8.9	51	46.6	5.8
FST	Follistatin	4.11	1	3.8	57	34.8	5.8
ALDOA	fructose-bisphosphate aldolase A isoform 1	29.12	8	15.8	303	39.4	8.1
gag	Gag polyprotein	6.13	1	2.9		19.6	8.7
GGH	Gamma-glutamyl hydrolase	8.12	2	2.3	40	30.9	7.5
GSN	gelsolin	1.98	1	3.8		72.0	6.3
GMFB	Glia maturation factor beta	8.26	1	2.6		12.7	9.4
PRKCSH	glucosidase 2 subunit beta-like isoform 2	12.57	6	14.6	110	59.1	4.5
N/A	glutamate	1.11	1	2.5		137.1	8.6
Gsta5	Glutathione S-transferase alpha-5	13.28	3	6.8		14.5	6.8
GSTM1	glutathione S-transferase Mu 1-like	15.14	1	18.8	287	25.5	6.4
GSTM2	glutathione S-transferase Mu 2-like	27.50	1	19.5	237	23.6	5.1
GSTO1	glutathione S-transferase omega-1-like isoform 3	12.50	2	5.4		23.5	7.7
GSTP1	glutathione S-transferase P 1	48.57	8	18.6	203	23.6	7.8
GAPDH	glyceraldehyde-3-phosphate dehydrogenase-like, partial	36.83	1	10.5	306	33.8	8.5
PYGB	Glycogen phosphorylase, brain form	2.13	2	4.4	42	85.7	5.9
GLG1	Golgi apparatus protein 1 precursor	12.33	12	37.1	390	132.2	6.8
GOLM1	Golgi membrane protein 1	21.82	2	4.2	97	12.5	8.2
GRN	granulins isoform 2	10.47	5	14.7	133	63.9	6.4
GRN	granulins isoform 3	7.78	4	14.5	69	57.0	6.5
PLA2G15	group XV phospholipase A2	2.67	1	2.2		47.2	6.5
RAN	GTP-binding nuclear protein Ran-like, partial	24.83	1	14.7	159	17.0	6.3
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	6.0	76	37.3	6.0
GNAL	Guanine nucleotide-binding protein G(olf) subunit alpha	6.75	1	3.1	60	18.6	7.9
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	17.70	2	3.9	77	23.1	4.7
Cd74	H-2 class II histocompatibility antigen gamma chain	9.73	2	2.8	70	36.3	8.7
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	14.69	3	2.3	80	34.2	9.2
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	18.94	5	13.3	179	33.1	5.0
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 2	14.97	4	12.1	96	32.4	5.1
HNRPDL	heterogeneous nuclear ribonucleoprotein D-like	9.59	1	9.1	110	30.2	8.7
HNRNPK	heterogeneous nuclear ribonucleoprotein K-like isoform 4	16.86	6	21.0	166	48.5	5.9
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	6.41	3	9.6	100	62.6	7.6
HDAC2	Histone deacetylase 2	9.89	1	2.2		10.6	4.4
HIST1H1D	histone H1.3-like	6.28	1		76	20.5	11.0
HIST1H2AG	Histone H2A type 1	25.38	8	49.8	515	34.2	11.1

HIST1H2AG	Histone H2B type 1	28.57	3	10.9	133	13.9	10.3
Hist3h2ba	histone H2B type 3-A	11.90	1	7.8	193	14.0	10.4
HIST1H3A	Histone H3	27.72	2	15.6	165	29.6	11.1
HIST3H3	Histone H3.1t	9.69	1	5.9	117	35.8	10.7
RBBP4	Histone-binding protein RBBP4	4.04	1	2.3		25.3	6.3
CUX1	homeobox protein cut-like 1	0.41	1	2.3		186.7	6.4
HAPLN1	hyaluronan and proteoglycan link protein 1-like	2.54	1	2.7		40.3	7.8
HAPLN4	hyaluronan and proteoglycan link protein 4-like	8.22	3	9.1	116	46.2	8.0
HMGCS2	hydroxymethylglutaryl-CoA synthase, mitochondrial	2.17	1	2.5		57.2	8.6
N/A	hypothetical protein I79_011206	3.13	1	3.9	45	69.3	6.3
N/A	hypothetical protein I79_015376	2.46	4	10.3	114	231.1	5.6
N/A	hypothetical protein I79_018775	8.62	1		40	13.1	9.5
N/A	hypothetical protein LOC100766349	21.10	3	13.6	184	25.5	9.9
N/A	hypothetical protein LOC100767830, partial	10.45	2	7.0	101	19.7	8.7
ITPR3	Inositol 1,4,5-trisphosphate receptor type 3	1.67	1	2.4		95.6	6.1
IMPA1	Inositol monophosphatase	4.66	1	6.5	68	25.6	6.8
ICAM1	intercellular adhesion molecule 1 precursor	2.66	1	3.1		57.6	7.2
IFNAR2	Interferon-alpha/beta receptor beta chain	10.67	2	7.4	112	28.7	5.6
IL1R1	Interleukin-1 receptor-like 1	5.44	2	7.1		37.6	9.0
IL11	interleukin-11-like	4.04	1	2.5		21.3	8.1
IDH1	isocitrate dehydrogenase	14.01	5	16.6	84	46.7	7.0
KRT10	Keratin, type I cytoskeletal 10	16.05	3	13.5	194	27.8	4.5
KRT24	keratin, type I cytoskeletal 24-like isoform 2	3.18	1	2.2		22.0	8.2
KRT26	keratin, type I cytoskeletal 26-like, partial	5.20	1	2.4		18.5	7.0
KRT77	Keratin, type II cytoskeletal 1b	8.86	5	27.2	250	93.4	5.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	10.43	1	17.2	234	45.9	8.1
KRT6A	Keratin, type II cytoskeletal 6A	4.16	1	5.9	41	48.5	8.0
KRT71	Keratin, type II cytoskeletal 71	6.07	5	15.6	155	133.3	6.6
MFGE8	lactadherin-like, partial	30.43	8	37.7	391	32.3	5.7
LMNA	Lamin-A/C	26.64	13	41.6	431	64.0	8.0
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.7	63	34.9	5.9
LAMA3	laminin subunit alpha-3	0.78	1	3.0	50	350.8	6.8
LAMA5	laminin subunit alpha-5 isoform 1	16.17	48	162.4	1481	405.6	6.9
N/A	Lamin-L(I)	4.76	2	6.9	72	54.9	4.9
N/A	liver carboxylesterase-like isoform 2	3.22	2	6.9		58.6	5.9

LDLR	low-density lipoprotein receptor precursor	3.98	3	9.1	96	94.5	4.9
LRP8	low-density lipoprotein receptor-related protein 8-like	1.67	1	3.9	48	112.3	5.0
KDM5A	Lysine-specific demethylase 5A	0.62	1	2.4		182.6	6.4
LPCAT1	Lysophosphatidylcholine acyltransferase 1	3.65	1	2.2		21.7	10.3
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase-like	18.64	6	17.5	153	45.6	7.7
CTSA	Lysosomal protective protein	24.63	10	43.3	341	54.2	6.1
PRCP	lysosomal Pro-X carboxypeptidase-like	5.69	2	6.7	72	55.4	6.7
PPT2	lysosomal thioesterase PPT2-like	5.96	1	4.4	47	34.3	6.5
LOXL4	Lysyl oxidase-like 4	16.25	11	35.9	196	84.7	8.0
KARS	lysyl-tRNA synthetase-like isoform 1	7.87	4	7.2	76	67.9	6.2
CSF1	macrophage colony-stimulating factor 1 isoform 2	12.06	3	8.2	100	29.5	7.4
MVP	Major vault protein	1.51	1	2.6	44	95.9	5.7
EPDR1	Mammalian ependymin-related protein 1	27.39	6	24.5	204	27.5	6.7
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA-like, partial	7.37	4	7.9	106	71.5	6.7
Rpl18	mCG132477, isoform CRA_c	9.56	1	2.7	51	15.2	11.8
MSLN	mesothelin	1.92	1	5.7	49	69.8	6.4
N/A	MGC84994 protein	10.53	1	2.6		9.0	6.0
MAP4	microtubule-associated protein 4	1.44	1	2.2		116.8	5.0
MAP6	microtubule-associated protein 6-like, partial	7.56	1	5.6		50.2	9.2
TIM13	Mitochondrial import inner membrane translocase subunit Tim13	19.18	1	3.7	84	8.5	9.1
TIMM8A	Mitochondrial import inner membrane translocase subunit Tim8 A	22.00	1	3.2	43	5.7	5.2
MYL9	myosin regulatory light polypeptide 9-like	12.21	2	5.1	40	19.9	4.8
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase-like isoform 1	24.86	7	36.5	229	37.2	7.5
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase-like isoform 2	8.93	3	10.5	74	36.1	6.8
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	3.98	1	3.3	42	38.3	5.9
PGLYRP2	N-acetylmuramoyl-L-alanine amidase	2.02	1	2.8		64.8	6.9
NPPB	natriuretic peptides B-like	15.70	2	5.4	58	13.4	10.1
NBL1	neuroblastoma suppressor of tumorigenicity 1-like	3.93	1		43	19.1	5.0
GANAB	neutral alpha-glucosidase AB isoform 2	9.85	7	20.1	182	106.9	6.0
NCEH1	neutral cholesterol ester hydrolase 1-like	1.94	1	3.1	43	68.3	7.8
Nid1	nidogen-1-like, partial	46.06	22	115.6	1318	54.6	6.4
ULBP1	NKG2D ligand 1-like	4.73	1	2.5		19.3	8.4
NSFL1C	NSFL1 cofactor p47-like isoform 2	31.89	8	26.0	292	40.7	5.1
NUMA1	nuclear mitotic apparatus protein 1-like, partial	1.13	2	7.8	71	229.7	5.6
NPLOC4	nuclear protein localization protein 4 homolog	1.45	1	3.1		76.5	7.0
NOLC1	Nucleolar phosphoprotein p130	2.15	1	3.6	65	73.4	9.5

NCL	nucleolin, C23, partial	12.08	8	21.9	332	73.2	4.7
NME1	nucleoside diphosphate kinase A-like isoform 1	47.37	4	16.4	133	17.2	6.3
SIL1	Nucleotide exchange factor SIL1	2.06	1	2.6	56	44.0	4.9
SIL1	nucleotide exchange factor SIL1, partial	4.90	2	7.9	121	48.7	5.2
OLA1	obg-like ATPase 1 isoform 1	2.27	1	2.9	41	44.7	7.8
OR10X1	olfactory receptor 10X1-like	3.23	1	2.3		34.4	8.6
OSMR	oncostatin-M-specific receptor subunit beta-like	1.34	1		40	110.4	6.2
OAF	Out at first protein-like	21.71	3	7.6		17.7	8.1
PALLD	Palladin	3.17	1	2.5		42.1	8.6
PAPLN	Papilin	7.82	6	5.6	232	127.2	7.3
PAPLN	papilin isoform 1	4.94	5	11.7	145	138.0	7.3
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	10.69	7	12.1	83	94.7	6.5
PAM	peptidyl-glycine alpha-amidating monooxygenase-like isoform 4	9.78	6	17.4	133	96.7	6.6
PPIA	Peptidyl-prolyl cis-trans isomerase	66.46	10	44.7	322	17.9	8.3
FKBP2	peptidyl-prolyl cis-trans isomerase FKBP2-like isoform 1	8.57	1	2.2		15.4	9.3
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3-like, partial	15.43	2	6.7		21.1	9.3
PPIH	Peptidyl-prolyl cis-trans isomerase H	6.72	1	2.4		14.6	8.4
POSTN	periostin isoform 5	3.46	2	9.2	92	83.5	8.0
PRDX6	peroxiredoxin-6-like, partial	16.44	4	4.9	65	24.5	6.8
PFAS	phosphoribosylformylglycinamidine synthase	0.82	1	2.6		144.6	5.6
PSAT1	phosphoserine aminotransferase isoform 2	12.20	4	15.1	131	40.8	9.1
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein-like	2.73	1	2.5		37.4	7.1
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	0.86	1		45	129.5	6.3
PCBP2	poly(rC)-binding protein 2 isoform 4	11.80	3	7.5	45	33.9	8.2
PABPC1	polyadenylate-binding protein 1-like, partial	14.36	7	21.5	89	63.4	9.6
PABPC4	Polyadenylate-binding protein 4	5.34	1	7.5	87	57.9	9.2
PTRF	polymerase I and transcript release factor-like	4.60	1	4.7	53	43.7	5.5
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	2.4	47	23.2	8.8
N/A	polyubiquitin	44.62	3	20.0	200	42.9	7.6
LMNA	prelamin-A/C-like isoform 2	27.64	15	61.0	543	73.7	8.0
CWC25	pre-mRNA-splicing factor CWC25 homolog	1.67	1	2.3		49.1	10.1
TSR2	Pre-rRNA-processing protein TSR2-like	13.45	1	2.9	43	13.2	4.4
CTSH	pro-cathepsin H-like	13.81	5	12.7	51	37.4	8.5
PROSC	Proline synthetase co-transcribed bacterial-like protein	11.21	2	8.3	56	24.8	6.4
PREPL	prolyl endopeptidase, partial	3.02	2	5.9	47	78.7	5.9
PSME2	proteasome activator complex subunit 2-like isoform 2	17.83	3	12.4	92	26.2	5.2

PSMA6	proteasome subunit alpha type-6-like, partial	5.91	1	3.8	73	24.4	6.6
PSMB2	proteasome subunit beta type-2-like	8.96	2	5.5	63	22.8	7.9
PRMT1	protein arginine N-methyltransferase 1 isoform 1	6.80	2	6.8	104	40.5	5.6
PRMT5	Protein arginine N-methyltransferase 5	3.47	2	5.9		66.3	5.7
CNPY2	Protein canopy-like 2	26.80	2	5.6	48	11.0	4.8
CDV3	protein CDV3 homolog	8.24	1	5.0	41	31.3	7.2
Ctla2b	protein CTLA-2-beta-like	25.00	3	9.4	83	11.8	5.1
DBF4	Protein DBF4-like A	4.19	1	3.9		40.4	5.7
TTLL8	protein monoglycylase TTLL8	1.08	1	5.0		95.4	8.5
ROGDI	protein rogdi homolog	3.78	1	2.2		32.8	8.3
SON	protein SON-like	0.41	1	2.4		263.6	5.6
TANC2	Protein TANC2	0.41	1	2.3		217.5	7.6
TFG	Protein TFG	13.89	1	2.9		8.4	7.3
PCMTD2	protein-L-isoaspartate O-methyltransferase domain-containing protein 2	3.62	1	2.3		40.8	6.7
PCDH7	Protocadherin-7	4.12	3	10.6	69	105.3	5.2
N/A	putative allantoicase	1.10	1	2.4	45	80.2	7.9
D1Pas1	putative ATP-dependent RNA helicase PI10-like	6.49	2	9.1	103	58.1	7.1
PM20D1	putative carboxypeptidase PM20D1	2.62	1	2.3		55.0	6.9
LUC7L2	putative RNA-binding protein Luc7-like 2 isoform 3	4.56	1	4.1	49	39.4	10.1
MEFV	Pyrin	1.46	1	2.3		76.3	7.1
PKM	pyruvate kinase isozymes M1/M2-like isoform 1	48.21	21	93.1	1046	57.9	7.3
N/A	pyruvate kinase isozymes M1/M2-like isoform 2	35.45	13	51.1	574	49.8	6.6
YPT1	Ras-like GTP-binding protein YPT1	22.92	2	5.2	50	10.9	5.1
RAB11A	ras-related protein Rab-11A isoform 1	14.35	3	8.0		24.4	6.6
RAB5A	ras-related protein Rab-5A-like	5.12	1	2.7		23.5	8.1
RAB7A	ras-related protein Rab-7a-like	9.66	2	5.3	44	23.5	6.7
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.6		20.8	5.8
Ptprs	Receptor-type tyrosine-protein phosphatase S	1.75	1	2.6		56.0	5.1
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	4.02	2	4.7		55.5	8.0
PDE6G	retinal rod rhodopsin-sensitive cGMP 3',5'-cyclic phosphodiesterase subunit gamma	12.64	1	2.3		9.7	9.5
RHOC	rho-related GTP-binding protein RhoC precursor	13.47	2	7.8	56	22.0	6.6
PRPS1	ribose-phosphate pyrophosphokinase 1-like	4.49	1	4.5		29.2	7.4
MRPL24	ribosomal protein L24, isoform CRA_c	19.09	2	5.7	56	13.0	11.0
RPS28	ribosomal protein S28	13.64	1	2.5		7.4	9.7
RRS1	ribosome biogenesis regulatory protein homolog, partial	4.46	1	2.5		22.4	11.3
RRBP1	ribosome-binding protein 1	0.89	1	3.4		158.2	9.0

RBM39	RNA-binding protein 39 isoform a	2.83	1	2.5	45	59.3	10.1
SALL1	Sal-like protein 1	0.77	1	2.2		137.3	7.0
SRSF5	serine/arginine-rich splicing factor 5	3.35	1	2.3		30.9	11.6
PPP2R1A	serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A beta isoform-like isoform 1	2.00	1	2.9		65.9	5.1
PPP2R2A	Serine/threonine-protein phosphatase 2A regulatory subunit B'	7.22	1	2.6		20.4	6.5
PPP1CA	Serine/threonine-protein phosphatase PP1-alpha catalytic subunit	17.57	2	6.9	82	16.6	6.8
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	15.45	4	10.1	158	37.5	6.3
SERPINB6	serpin B6 isoform 1	14.29	5	19.6	80	43.1	5.9
SH2D3C	SH2 domain-containing protein 3C	1.10	1	2.3		90.7	8.5
SIAE	sialate O-acetylesterase-like	20.36	9	27.1	299	61.4	8.2
SSB	Sjogren syndrome antigen B	2.90	1	2.3		36.0	9.3
SLITRK4	SLIT and NTRK-like protein 4	1.21	1	42.1		92.7	7.9
SUMO2	small ubiquitin-related modifier 2-like	12.63	1	6.3	42	10.8	6.9
SNX1	sorting nexin-1 isoform 2	3.06	1	3.6	55	51.7	5.7
SPTBN1	spectrin beta chain, brain 1 isoform 1	2.16	4	13.0	118	274.0	5.6
SPTBN1	spectrin beta chain, brain 1 isoform 2	0.74	2	4.7		250.9	5.6
SPTBN4	spectrin beta chain, brain 4-like	0.28	1	2.3		403.9	6.3
N/A	Sperm motility kinase X	5.08	1		41	22.1	6.7
SRM	Spermidine synthase	18.90	4	9.6	103	28.7	5.5
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	5.85	1	3.2		22.8	5.6
SF3A1	splicing factor 3A subunit 1 isoform 2	4.38	3	9.5	41	81.7	5.3
SF3B2	splicing factor 3B subunit 2-like	2.73	2	4.6		98.2	5.6
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	17.38	4	13.8	86	40.2	6.7
U2AF2	Splicing factor U2AF 65 kDa subunit	4.27	1	4.2	50	45.7	4.9
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	24.38	5	17.4	108	22.3	7.9
SRSF7	Splicing factor, arginine/serine-rich 7	5.29	1	2.7		26.1	11.9
CTTN	src substrate cortactin-like isoform 1	1.82	1	2.6		49.0	5.1
STMN2	Stathmin-2	9.69	2	5.3		22.3	8.2
QSOX1	Sulfhydryl oxidase 1	20.99	10	38.2	391	70.3	7.9
SULT1C2	sulfotransferase 1C2-like	4.01	1	2.2		35.3	8.3
SOD1	superoxide dismutase	14.88	2	6.4	105	25.9	9.6
SRPX	sushi-repeat-containing protein SRPX	13.16	5	19.3	110	48.4	8.6
SMARCC2	SWI/SNF complex subunit SMARCC2	0.89	1	2.3		121.9	5.4
SWAP70	switch-associated protein 70	1.71	1	3.3	44	68.7	6.2
VAT1	Synaptic vesicle membrane protein VAT-1-like	21.62	4	13.6	160	28.5	7.6
TCP1	T-complex protein 1 subunit alpha	20.86	10	31.5	316	60.3	6.0

CCT5	T-complex protein 1 subunit epsilon-like isoform 1	9.06	5	7.9	131	59.5	5.5
CCT8	T-complex protein 1 subunit theta	20.98	3	3.0	90	22.2	4.9
TNXB	Tenascin-X	4.43	2	4.0	55	274.9	5.2
TTC25	tetratricopeptide repeat protein 25	1.09	1	2.2		73.3	5.6
TGFBR2	TGF-beta receptor type-2 isoform 1	2.65	1	12.3		64.3	6.0
THOP1	thimet oligopeptidase-like	5.09	2	7.2	77	78.1	6.0
TXNRD1	thioredoxin reductase 1	20.04	8	18.3	233	54.7	6.8
TARSL2	threonyl-tRNA synthetase, cytoplasmic isoform 2	3.17	2	6.9	68	80.6	6.9
TFPI	tissue factor pathway inhibitor-like	28.43	6	30.7	230	34.4	8.2
TANK	TRAF family member-associated NF-kappa-B activator	4.22	1	3.8	42	48.7	5.3
TCEB2	transcription elongation factor B polypeptide 2-like	20.66	1		41	13.3	5.0
TRA2B	transformer-2 protein homolog beta isoform 1	5.56	1	2.9	75	33.6	11.3
TNPO1	Transportin-1	1.73	1	2.3		79.2	5.1
TPM1	tropomyosin alpha-1 chain-like	16.20	4	25.6	202	32.8	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 2	26.32	6	25.3	224	28.8	4.8
TPM2	Tropomyosin beta chain	16.98	3	10.2	108	30.7	4.8
TPM2	tropomyosin beta chain-like, partial	15.12	3	9.8	84	29.9	4.6
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	50	14.4	4.8
TSKU	tsukushin-like	3.95	1	4.0		38.1	6.6
N/A	Tubulin alpha chain, nucleomorph	5.15	2	30.5	60	43.1	4.9
TUBA1C	tubulin alpha-1C chain	19.60	6	19.1	276	49.9	5.1
TUBB2A	Tubulin beta-2 chain	26.81	5	44.6	397	46.5	5.0
TUBB2A	tubulin beta-2A chain-like	9.21	2	63.6	484	27.3	5.1
TUBB2B	tubulin beta-2B chain-like	29.57	3	40.9	347	49.6	4.9
TUBB3	Tubulin beta-3 chain	8.62	1	23.4	272	85.4	6.0
TUBB4B	tubulin beta-4B chain	22.79	8	37.3	327	41.8	4.9
N/A	Tubulin beta-6 chain	9.30	2	86.1	878	24.6	4.9
TNFSF9	tumor necrosis factor ligand superfamily member 9-like	8.47	2	11.4	125	33.6	6.2
ZRSR1	U2 small nuclear ribonucleoprotein auxiliary factor 35 kDa subunit-related protein 1-like	2.34	1	2.3		51.0	9.1
SNRPB2	U2 small nuclear ribonucleoprotein B''	6.11	1	3.2		20.1	9.7
SNRNP40	U5 small nuclear ribonucleoprotein 40 kDa protein-like	7.13	1	3.8	41	48.3	8.9
LSM2	U6 snRNA-associated Sm-like protein LSm2	11.70	1	3.4	74	10.7	6.5
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	1.20	1	2.5		93.3	5.1
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2-like, partial	13.10	2	5.5	57	15.4	4.9
UBXN1	UBX domain-containing protein 1-like, partial	10.08	1	2.3		13.0	5.5
UGDH	UDP-glucose 6-dehydrogenase-like, partial	18.52	4	14.7	149	29.4	7.6

N/A	uncharacterized protein C12orf29 homolog	4.31	1	2.3		37.3	7.3
N/A	Uncharacterized protein KIAA0319-like	2.11	1		62	104.3	6.1
N/A	uncharacterized protein KIAA0586-like, partial	0.75	1	2.3		161.7	6.1
C22orf28	UPF0027 protein C22orf28-like	2.50	1	2.4		47.8	7.1
C14orf166	UPF0568 protein C14orf166-like	8.18	1	3.1		12.3	6.9
PLAUR	Urokinase plasminogen activator surface receptor	5.38	1	2.3	43	20.3	5.1
VCAM1	vascular cell adhesion protein 1-like, partial	2.61	1	2.9		42.5	4.8
VASN	vasorin-like	1.49	1	2.7	53	72.5	7.5
NSF	vesicle-fusing ATPase-like, partial	14.29	1	5.5	53	8.6	5.4
VCL	vinculin isoform 1	16.70	15	51.0	449	116.6	6.0
TCIRG1	V-type proton ATPase 116 kDa subunit a isoform 3-like	1.56	1	2.2		93.3	6.7
N/A	WD repeat-containing protein 61-like isoform 1	3.93	1	2.6		33.6	5.6
XPNPEP1	xaa-Pro aminopeptidase 1	1.77	1	3.2	42	69.8	5.5
ZEB2	zinc finger E-box-binding homeobox 2-like	0.91	1	2.2		135.4	6.1

Table 3.3.58: HCPs from the cell culture supernatant of a non-producing CHO K1 cell line identified with one or more peptides as being unique to the CHO BB database.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAB	14-3-3 protein beta/alpha	19.92	4	20.5	170	28.1	4.8
MRPS27	28S ribosomal protein S27, mitochondrial	2.89	1	2.3		47.8	5.9
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial	3.27	1	2.5		41.9	8.3
RPS14	40S ribosomal protein S14	20.92	2	2.8	74	16.5	9.9
RPS17	40S ribosomal protein S17	14.60	2	5.4	42	15.7	9.9
RPS4	40S ribosomal protein S4	13.69	3	7.6	74	29.6	10.2
RPS7	40S ribosomal protein S7	13.92	3	6.8	44	22.1	10.1
RPL10A	60S ribosomal protein L10a	3.69	1		42	24.8	9.9
RPL15	60S ribosomal protein L15	14.71	3	8.6	61	24.1	11.6
RPL15	60S ribosomal protein L15-B	4.46	1	2.2		24.0	11.2
RPL18	60S ribosomal protein L18	6.91	1	2.7	51	21.6	11.8
RPL22	60S ribosomal protein L22	39.84	4	10.5	282	14.8	9.3
RPL24	60S ribosomal protein L24	13.38	2	5.7	56	17.8	11.3
RPL36	60S ribosomal protein L36	20.00	2	4.8		12.2	11.7
RPL38	60S ribosomal protein L38	18.06	1		53	8.4	10.1
HSPA5	78 kDa glucose-regulated protein	37.16	20	109.2	804	72.3	5.2
N/A	Actin, cytoplasmic type 5	4.80	1		42	30.2	5.5
ACTR3	Actin-related protein 3	8.85	3	11.2		47.3	5.9
CAP1	Adenylyl cyclase-associated protein 1	10.13	4	12.8	175	51.5	7.3
AGRN	Agrin	11.76	2	5.9	62	20.4	6.3
AKR1A1	Alcohol dehydrogenase (NADP+)	15.17	5	13.8	151	36.3	7.1
Akr1b8	Aldose reductase-related protein 2	16.46	5	11.9	99	36.3	6.7
ACTR1A	Alpha-centractin	2.66	1	3.3		42.5	6.6
ANXA2	Annexin A2	42.48	14	63.5	629	38.6	8.0
ANXA6	Annexin A6	2.91	2	5.9		77.6	5.6
DDX3X	ATP-dependent RNA helicase DDX3X	5.99	3	9.1	106	63.2	6.8
DHX8	ATP-dependent RNA helicase DHX8	0.80	1	2.3		142.4	8.1
CBR1	Carbonyl reductase [NADPH] 1	15.16	4	10.6	133	30.5	7.7
CTSH	Cathepsin H	13.65	5	12.7	51	37.7	8.5
CTSZ	Cathepsin Z	27.12	7	31.8	264	34.0	7.6
CD44	CD44 antigen	9.29	2	8.5	120	25.1	5.7
CD81	CD81 antigen	8.47	1	3.9	52	25.7	5.5
CDC42	Cell division control protein 42 homolog	10.99	2	6.1	76	21.3	6.0
CNBP	Cellular nucleic acid-binding protein	7.65	1	3.9		18.7	7.7

ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide- alpha-2,3-sialyltransferase 1	24.39	2	6.7	69	9.6	10.1
CFH	Complement factor H	7.46	1		46	22.6	7.0
CXCL3	C-X-C motif chemokine 3	9.90	1	2.9	52	11.1	8.8
DEPTOR	DEP domain-containing mTOR-interacting protein	8.33	1	2.4		11.6	8.4
ADAM19	Disintegrin and metalloproteinase domain-containing protein 19	32.90	3	11.1	107	17.2	6.8
ADAM22	Disintegrin and metalloproteinase domain-containing protein 22	5.76	2	8.0		54.2	6.9
DYNLL2	Dynein light chain 2, cytoplasmic	13.48	1		45	10.3	7.4
EEF1D	Elongation factor 1-delta	16.61	3	8.5	121	32.2	5.2
ELP2	Elongator complex protein 2	1.58	1	3.8	64	92.1	5.9
ERH	Enhancer of rudimentary homolog	7.69	1	3.2		12.2	5.5
GSPT1	Eukaryotic peptide chain release factor GTP-binding subunit ERF3A	1.86	1	2.2		59.7	5.6
EIF1AX	Eukaryotic translation initiation factor 1A, X-chromosomal	15.28	2	4.6		16.4	5.2
EIF3C	Eukaryotic translation initiation factor 3 subunit C	2.74	2	7.1		105.5	5.7
EIF5A2	Eukaryotic translation initiation factor 5A-2	18.06	2	10.1	124	7.8	8.5
SSRP1	FACT complex subunit SSRP1	1.55	1	2.3		80.9	7.0
FDPS	Farnesyl pyrophosphate synthase	5.79	2	6.1	43	41.6	5.5
FBXW7	F-box/WD repeat-containing protein 7	3.77	1	2.4		39.4	4.8
FN1	Fibronectin	12.91	22	58.4	529	262.8	6.2
FLNB	Filamin-B	5.46	6	15.5	160	149.2	5.9
ALDOA	Fructose-bisphosphate aldolase A	25.34	7	15.8	301	40.0	8.1
FAH	Fumarylacetoacetase	3.10	1	3.5	63	46.2	7.6
LGALS1	Galectin-1	34.81	4	8.6	152	14.8	6.2
G6PD	Glucose-6-phosphate 1-dehydrogenase	9.15	1	3.4	57	18.8	6.4
PRKCSH	Glucosidase 2 subunit beta	10.67	6	18.3	77	59.1	4.5
Gsta6	Glutathione S-transferase A6	4.64	1	2.5		22.5	6.0
GSTP1	Glutathione S-transferase P	48.57	8	18.6	218	23.6	7.8
GLG1	Golgi apparatus protein 1	7.51	7	23.0	124	111.1	8.2
GNA12	Guanine nucleotide-binding protein subunit alpha-12	3.24	1	10.3	82	39.7	9.5
H2-Q10	H-2 class I histocompatibility antigen, Q10 alpha chain	49.33	2	3.9	79	8.5	5.3
HNRNPCL1	Heterogeneous nuclear ribonucleoprotein C	13.97	4	12.1	100	34.6	5.1
HNRNPH2	Heterogeneous nuclear ribonucleoprotein H2	5.79	2	7.2	63	49.2	6.3
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	15.58	6	21.0	177	52.3	5.5
SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	7.30	3	2.9	114	62.6	7.6
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	17.70	5	13.3	192	35.4	5.1
HARS	Histidyl-tRNA synthetase, cytoplasmic	2.31	1	2.2	48	39.4	6.0
HIST1H2AJ	Histone H2A type 1-J	52.86	3	18.1	113	7.8	10.1
HIST1H2BH	Histone H2B type 1-H	30.51	4	10.9	142	13.1	10.1
H3F3A	Histone H3.3	11.76	2	4.8		15.3	11.3
N/A	Idua-006	1.27	1	2.3		68.7	7.4

IMPA1	Inositol monophosphatase 1	6.14	1	4.0	43	30.4	5.5
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	14.01	5	16.6	88	46.7	7.0
TMPO	Lamina-associated polypeptide 2, isoform beta	7.46	2	5.7	88	43.3	9.5
LMNB1	Lamin-B1	5.44	2	8.6	56	54.4	5.1
LAMA5	Laminin subunit alpha-5	37.19	11	42.2	414	34.9	6.7
LDLR	Low-density lipoprotein receptor	5.93	3	9.1	100	64.0	5.4
SSB	Lupus La protein homolog	2.21	1	2.3		47.7	9.4
LOXL4	Lysyl oxidase homolog 4	5.99	1	3.2	57	19.3	6.8
KARS	Lysyl-tRNA synthetase	8.12	4	7.2	77	66.0	6.2
CSF1	Macrophage colony-stimulating factor 1	5.62	3	8.2	103	60.7	5.5
MAP6	Microtubule-associated protein 6	8.82	1	5.6		10.8	8.6
MOAP1	Modulator of apoptosis 1	2.60	1	2.3		30.4	6.4
O14950	Myosin regulatory light chain 12B	12.21	2	5.1	40	19.8	4.9
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase	24.86	7	36.5	250	37.2	7.5
AHNAK	Neuroblast differentiation-associated protein AHNAK	13.68	6	24.8	204	106.1	6.4
GANAB	Neutral alpha-glucosidase AB	9.63	7	20.1	196	109.4	6.1
NSFL1C	NSFL1 cofactor p47	31.72	8	26.0	322	41.0	5.2
NUMA1	Nuclear mitotic apparatus protein 1	2.29	1	3.2	45	55.1	5.1
NME1	Nucleoside diphosphate kinase A	46.75	4	16.4	146	17.4	7.4
SPG7	Paraplegin	2.46	1	2.6		27.0	7.1
PAM	Peptidyl-glycine alpha-amidating monooxygenase	10.98	7	12.1	86	92.4	6.5
PPID	Peptidyl-prolyl cis-trans isomerase D	4.86	2	9.4	43	40.8	7.2
FKBP2	Peptidyl-prolyl cis-trans isomerase FKBP2	8.57	1		48	15.4	9.3
POSTN	Periostin	6.88	1	2.3	47	18.0	8.4
PRDX2	Peroxiredoxin-2	13.13	3	6.1	82	21.8	5.6
PRDX6	Peroxiredoxin-6	16.07	4	4.9	68	25.0	6.8
PLEKHG3	Pleckstrin homology domain-containing family G member 3	2.66	1		67	43.6	7.8
PCBP1	Poly(rC)-binding protein 1	13.96	3	10.0	87	32.4	6.5
UBB	Polyubiquitin-B	45.45	3	14.6	146	12.4	8.4
LMNA	Prelamin-A/C	25.24	13	48.0	482	69.0	6.9
DDX17	Probable ATP-dependent RNA helicase DDX17	11.27	2	10.3	150	23.6	6.0
DDX23	Probable ATP-dependent RNA helicase DDX23	1.37	1	6.9		93.3	9.5
PCNA	Proliferating cell nuclear antigen	19.92	6	11.1	131	28.8	4.7
PROSC	Proline synthase co-transcribed bacterial homolog protein	9.09	2	8.3	56	30.5	8.3
PREP	Prolyl endopeptidase	2.92	2	5.9	47	81.2	6.0
PSMA6	Proteasome subunit alpha type-6	13.01	3	8.4	73	27.4	7.2
PSMA7	Proteasome subunit alpha type-7-like	11.42	2	7.8	82	24.5	8.9
PRMT1	Protein arginine N-methyltransferase 1	6.47	2	6.8	108	42.4	5.4
CNPY2	Protein canopy homolog 2	14.29	2	5.6		20.7	5.1

CDV3	Protein CDV3	11.73	1	5.3	61	21.7	5.3
DPY19L1	Protein dpy-19 homolog 1	1.69	1	2.3		74.2	8.6
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	2.23	2	4.6		115.1	5.4
PPP1R14B	Protein phosphatase 1 regulatory subunit 14B	19.84	1		99	14.2	4.8
PCMT1	Protein-L-isoaspartate(D-aspartate) O-methyltransferase	3.86	1	2.5		30.3	8.0
PKM	Pyruvate kinase isozymes M1/M2	48.21	21	93.1	1141	57.9	7.3
RAB11A	Ras-related protein Rab-11A	14.35	3	8.0		24.4	6.6
RAB1B	Ras-related protein Rab-1B	15.71	2	8.2	66	15.9	5.6
RAB5B	Ras-related protein Rab-5B	5.12	1	2.7		23.7	8.1
RAB6A	Ras-related protein Rab-6A	10.58	2	8.1	45	23.5	5.5
RAP1B	Ras-related protein Rap-1b	5.98	1	2.4		20.8	5.8
RPA1	Replication protein A 70 kDa DNA-binding subunit	5.01	3	7.3	47	68.5	7.9
RRS1	Ribosome biogenesis regulatory protein homolog	9.28	1	2.5		10.6	11.7
SRSF1	Serine/arginine-rich splicing factor 1	20.14	3	6.0	42	16.4	11.4
SRSF4	Serine/arginine-rich splicing factor 4	9.09	1	2.8	45	11.2	7.1
SRSF7	Serine/arginine-rich splicing factor 7	6.28	1	11.6	126	22.1	11.6
PPP2R4	Serine/threonine-protein phosphatase 2A activator	21.31	1	2.6		6.9	9.4
PPP1CC	Serine/threonine-protein phosphatase PP1-gamma catalytic subunit	4.36	1		41	36.7	6.3
SERPINB6	Serpin B6	14.17	5	19.6	80	43.4	5.9
SUMO3	Small ubiquitin-related modifier 3	12.00	1	6.3	42	11.3	6.3
N/A	Son-012	2.48	1	2.4		47.8	10.7
Q13596	Sorting nexin-1	2.68	1	3.6	55	58.9	5.2
SF3A1	Splicing factor 3A subunit 1	4.80	2	5.1		41.9	9.6
SF3B3	Splicing factor 3B subunit 3	4.03	4	13.3	116	135.4	5.3
CTTN	Src substrate cortactin	5.41	1		48	34.9	7.0
STMN1	Stathmin	18.12	3	8.0	43	17.3	6.3
SOD1	Superoxide dismutase (Cu-Zn)	23.38	2	6.4	112	15.8	6.6
SOD1	Superoxide dismutase [Cu-Zn]	7.79	1	2.8		15.8	6.6
VAT1	Synaptic vesicle membrane protein VAT-1 homolog	17.18	3	13.0	157	28.8	8.0
CCT5	T-complex protein 1 subunit epsilon	9.06	5	7.9	141	59.5	5.6
TGFBR2	TGF-beta receptor type-2	2.79	1	4.1		61.0	5.7
TXNRD1	Thioredoxin reductase 1, cytoplasmic	18.98	8	18.3	262	57.8	7.5
TARS	Threonyl-tRNA synthetase, cytoplasmic	3.18	2	6.9	68	80.0	7.1
TRA2B	Transformer-2 protein homolog beta	5.56	1	2.9	53	33.6	11.3
TGFB1	Transforming growth factor beta-1	12.54	3	9.3	107	33.2	8.6
RHOA	Transforming protein RhoA	19.69	3	10.7	103	21.8	6.1
TMOD3	Tropomodulin-3	2.84	1	3.1	59	39.7	5.1
TPM3	Tropomyosin alpha-3 chain	8.59	1		40	15.2	4.7
TPM4	Tropomyosin alpha-4 chain	23.14	5	32.0	286	27.8	4.6

TUBA1B	Tubulin alpha-1B chain	11.83	3		147	30.8	5.7
TUBA8	Tubulin alpha-8 chain	8.97	1	3.8	72	17.7	6.7
TUBB4B	Tubulin beta-2C chain	27.69	3	49.9	558	48.8	5.1
N/A	Tubulin beta-7 chain	10.49	4	144.9	1530	50.1	4.9
USP5	Ubiquitin carboxyl-terminal hydrolase 5	1.20	1	2.5		93.3	5.1
UBE2K	Ubiquitin-conjugating enzyme E2 K	5.00	1	2.7	51	22.4	5.4
UBXN1	UBX domain-containing protein 1	3.67	1	2.4		24.8	5.0
UGDH	UDP-glucose 6-dehydrogenase	18.46	7	22.8	220	54.9	7.6
UAP1	UDP-N-acetylhexosamine pyrophosphorylase	2.69	1	7.7	79	58.6	6.4
C22orf28	UPF0027 protein C22orf28 homolog	2.18	1	2.8	42	55.2	7.2
C14orf166	UPF0568 protein C14orf166 homolog	8.29	1	6.4	125	22.4	7.0
UGP2	UTP--glucose-1-phosphate uridylyltransferase	6.50	3	7.6	49	56.9	7.6
VCL	Vinculin	13.21	2	6.2	42	17.3	5.1
VIPAS39	VPS33B-interacting protein	2.24	1	9.4		56.7	7.4
RNPEPL1	Arginyl aminopeptidase-like 1	1.42	1	2.4	47	55.6	4.9
CRLF3	Cytokine receptor-like factor 3	5.18	1	2.3		21.7	5.0
KIAA0319L	Dyslexia-associated protein KIAA0319-like protein	8.24	2		114	37.4	7.6
OLA1	Obg-like ATPase 1	2.27	1	2.9	41	44.7	7.5
TXNL1	Thioredoxin-like protein 1	11.38	2		73	36.1	5.1
FAU	Ubiquitin-like protein FUBI	7.52	1	2.6		14.3	10.3

Table 3.3.59: Table displaying the number of proteins identified in the conditioned media of a DP12 cell line grown under temperature shift and non-temperature shift cultures with samples taken at 24, 72, 96, 120 and 144 hours post temperature shift. RAW files from the mass spectral analysis were searched against the CHO NCBI and CHO BB protein databases. Columns are divided into those proteins identified by 1 peptide and proteins identified by 2 or more peptides.

	1 Peptide	**2 or more peptides**	**Total**
CHO NCBI	261	584	845
CHO BB	204	532	736

Table 3.3.60: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being common to both NCBI and CHO BB databases.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI	No. of peptides used for ID from BB Database	No. of peptides used for ID from NCBI Database
ADPRH	[Protein ADP-ribosylarginine] hydrolase	3.71	1	4.1	67	38.8	6.3	1	1
HSPE1	10 kDa heat shock protein, mitochondrial	23.53	2	5.6	57	10.9	9.2	≥2	≥2
YWHAH	14-3-3 protein eta	47.15	7	39.1	286	28.2	4.9	≥2	≥2
YWHAQ	14-3-3 protein theta	52.61	9	53.6	446	28.2	4.8	≥2	≥2
YWHAZ	14-3-3 protein zeta/delta	46.53	9	63.1	695	27.7	4.8	≥2	≥2
PSMD2	26S proteasome non-ATPase regulatory subunit 2	4.52	3	12.2	126	100.1	5.2	≥2	1
PSMD4	26S proteasome non-ATPase regulatory subunit 4	16.84	4	15.2	163	41.1	4.8	≥2	≥2
PSMD9	26S proteasome non-ATPase regulatory subunit 9	9.46	2	7.7		24.6	6.4	≥2	≥2
RPS10	40S ribosomal protein S10	13.26	2	11.1	145	20.4	10.1	≥2	1
RPS11	40S ribosomal protein S11	18.35	3	11.4		18.4	10.3	≥2	≥2
RPS12	40S ribosomal protein S12	47.11	7	23.0	44	13.5	7.9	≥2	≥2
RPS15	40S ribosomal protein S15	13.10	1	4.1	66	17.0	10.4	1	1
RPS15A	40S ribosomal protein S15a	30.77	4	14.2	120	14.8	10.1	≥2	≥2
RPS16	40S ribosomal protein S16	17.58	3	8.1	96	18.5	10.3	≥2	≥2
RPS18	40S ribosomal protein S18	30.26	5	11.6	117	17.7	11.0	≥2	≥2
RPS19	40S ribosomal protein S19	25.00	5	15.6	105	18.0	10.2	≥2	≥2
RPS2	40S ribosomal protein S2	17.23	4	15.5	41	29.0	10.2	≥2	≥2
RPS20	40S ribosomal protein S20	13.24	2	5.6	48	15.2	9.9	≥2	≥2
RPS21	40S ribosomal protein S21	22.89	2	6.7	51	9.1	8.3	≥2	1
RPS24	40S ribosomal protein S24	31.03	2	6.7	57	10.0	10.6	≥2	≥2
RPS25	40S ribosomal protein S25	14.63	2	6.2	56	13.5	10.1	≥2	≥2
RPS26	40S ribosomal protein S26	20.87	2	5.7		13.0	11.0	≥2	≥2
RPS27	40S ribosomal protein S27	22.41	1	3.7	69	6.8	8.0	1	1
RPS3	40S ribosomal protein S3	33.33	7	26.5	194	26.7	9.7	≥2	≥2
RPS3A	40S ribosomal protein S3a	19.32	5	15.3	61	29.9	9.7	≥2	1
RPS4	40S ribosomal protein S4	9.89	2	5.3	55	29.6	10.2	≥2	≥2
RPS6	40S ribosomal protein S6	13.25	3	8.6		28.6	10.8	≥2	≥2
RPS8	40S ribosomal protein S8	16.83	3	10.0	68	24.2	10.3	≥2	≥2
RPS9	40S ribosomal protein S9	18.04	4	9.8	83	22.5	10.7	≥2	≥2
RPSA	40S ribosomal protein SA	47.12	10	41.8	259	32.9	4.9	≥2	≥2
SDF4	45 kDa calcium-binding protein	47.89	11	58.7	439	41.2	4.9	≥2	≥2
SLC3A2	4F2 cell-surface antigen heavy chain	5.73	2	6.1		57.8	5.3	≥2	≥2

RPLP0	60S acidic ribosomal protein P0	38.97	8	33.1	167	29.9	8.5	≥2	≥2
RPLP1	60S acidic ribosomal protein P1	26.83	2	6.2	53	9.0	5.2	≥2	≥2
RPLP2	60S acidic ribosomal protein P2	85.22	4	20.0	191	11.7	4.6	≥2	≥2
RPL10	60S ribosomal protein L10	12.88	2	5.1		18.6	9.9	≥2	≥2
RPL10A	60S ribosomal protein L10a	6.99	1	1.9		15.8	10.0	1	1
RPL11	60S ribosomal protein L11	18.56	3	9.1	56	19.0	9.8	≥2	≥2
RPL12	60S ribosomal protein L12	37.17	5	21.7	153	20.7	10.1	≥2	≥2
RPL13	60S ribosomal protein L13	5.67	1	2.5	44	22.4	11.8	1	1
RPL18	60S ribosomal protein L18	12.23	2	5.6	55	21.6	11.8	≥2	1
RPL19	60S ribosomal protein L19	17.24	2	5.6	50	6.9	9.8	≥2	≥2
RPL21	60S ribosomal protein L21	8.66	1	2.5		14.7	11.7	1	1
RPL23	60S ribosomal protein L23	25.00	2	9.9	89	14.9	10.5	≥2	1
RPL23A	60S ribosomal protein L23a	32.69	6	19.6	121	17.7	10.4	≥2	≥2
RPL26	60S ribosomal protein L26	24.14	4	10.6	56	17.2	10.6	≥2	≥2
RPL27	60S ribosomal protein L27	8.18	1	2.5		12.1	10.1	1	1
RPL29	60S ribosomal protein L29	9.65	1	6.0	56	12.4	11.5	1	1
RPL3	60S ribosomal protein L3	9.68	3	4.6	44	46.1	10.2	≥2	≥2
RPL30	60S ribosomal protein L30	51.30	4	21.1	84	12.8	9.6	≥2	≥2
RPL31	60S ribosomal protein L31	24.80	3	9.1	58	14.4	10.5	≥2	1
RPL5	60S ribosomal protein L5	24.24	5	21.9	125	34.4	9.7	≥2	1
Rpl6	60S ribosomal protein L6	24.74	6	15.5	85	32.7	10.5	≥2	1
RPL7A	60S ribosomal protein L7a	14.20	2	6.5		19.7	9.7	≥2	≥2
RPL8	60S ribosomal protein L8	8.33	1	2.6		14.1	10.6	1	1
RPL9	60S ribosomal protein L9	15.10	2	7.1	87	21.8	10.0	≥2	≥2
PGD	6-phosphogluconate dehydrogenase, decarboxylating	26.84	10	45.0	342	53.6	6.9	≥2	≥2
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1	6.95	4	17.7	191	77.3	7.6	1	≥2
ABHD14A	Abhydrolase domain-containing protein 14A	11.16	2	6.4		27.1	9.4	≥2	≥2
ACAT2	Acetyl-CoA acetyltransferase, cytosolic	16.88	3	21.4	155	41.0	7.3	≥2	≥2
ASAH1	Acid ceramidase	25.82	11	33.6	172	44.6	7.9	≥2	≥2
ANP32A	Acidic leucine-rich nuclear phosphoprotein 32 family member A	4.74	1	3.9	59	26.7	4.1	1	1
ANP32B	Acidic leucine-rich nuclear phosphoprotein 32 family member B	14.23	4	13.7		31.9	4.0	≥2	1
ANP32E	Acidic leucine-rich nuclear phosphoprotein 32 family member E	20.99	4	19.5	129	29.9	3.9	≥2	≥2
ACTR2	Actin-related protein 2	8.23	1	5.0		17.7	5.9	1	1
ARPC4	Actin-related protein 2/3 complex subunit 4	6.59	1	2.6	40	19.5	8.4	1	1
SUB1	Activated RNA polymerase II transcriptional coactivator p15	33.07	3	11.9	139	14.4	9.6	≥2	≥2
AHSA1	activator of 90 kDa heat shock protein ATPase homolog 1	6.51	1		58	38.1	5.5	1	1
DBI	Acyl-CoA-binding protein	59.77	4	10.0	124	10.0	8.8	≥2	≥2
CRKL	adapter molecule crk-like	8.56	2	11.9	130	36.1	5.7	1	≥2
APRT	Adenine phosphoribosyltransferase	21.67	3	13.5	107	19.4	6.6	≥2	≥2

AHCY	adenosylhomocysteinase	22.92	9	29.2	227	47.6	6.5	≥2	≥2
AK2	Adenylate kinase 2, mitochondrial	39.66	6	33.6	204	25.6	7.4	≥2	≥2
ADSL	Adenylosuccinate lyase	4.55	2	4.5		54.9	6.9	≥2	≥2
ARF1	ADP-ribosylation factor 1	24.31	3	10.8	115	20.7	6.3	≥2	1
AARS	Alanyl-tRNA synthetase, cytoplasmic	12.08	8	26.5	221	104.8	5.6	≥2	≥2
ADH5	Alcohol dehydrogenase class-3	8.88	3	13.2	109	41.8	7.8	≥2	≥2
AKR1B1	Aldose reductase	38.61	8	37.2	191	35.8	7.4	≥2	≥2
LRPAP1	Alpha-2-macroglobulin receptor-associated protein	8.26	2	9.0	50	41.1	7.1	≥2	≥2
ACTN1	Alpha-actinin-1	26.02	20	77.9	430	104.5	5.8	≥2	≥2
ACTN4	Alpha-actinin-4	31.86	6	37.1	307	33.7	4.9	≥2	≥2
ENO1	Alpha-enolase	61.29	20	132.6	1005	47.1	6.2	≥2	≥2
GLA	Alpha-galactosidase A	22.14	7	24.9	192	47.6	5.1	≥2	≥2
IDUA	alpha-L-iduronidase	15.13	7	16.9	216	72.1	6.8	≥2	≥2
MAN2A1	Alpha-mannosidase 2	12.28	11	39.9	263	125.3	7.5	≥2	≥2
NAGA	Alpha-N-acetylgalactosaminidase	37.59	11	45.4	321	47.2	7.8	≥2	≥2
NAGLU	alpha-N-acetylglucosaminidase-like	5.68	3	11.5	128	83.4	6.7	1	≥2
AMPD2	AMP deaminase 2	1.00	1	2.5		91.9	6.3	1	1
APP	Amyloid beta A4 protein	40.88	22	108.6	640	84.7	4.8	≥2	≥2
APLP2	Amyloid-like protein 2	21.11	12	37.9	220	78.3	4.9	≥2	≥2
ANKS3	ankyrin repeat and SAM domain-containing protein 3	1.68	1	2.3		72.3	5.3	1	1
ANXA1	Annexin A1	51.45	12	54.1	452	38.8	7.0	≥2	≥2
ANXA5	Annexin A5	27.41	8	26.6	207	36.0	5.1	≥2	≥2
AP1B1	AP-1 complex subunit beta-1	1.17	1	2.8		103.9	5.2	1	1
AIFM1	Apoptosis-inducing factor 1, mitochondrial	2.45	1	3.0		66.7	9.0	1	1
ARSA	arylsulfatase A	17.57	4	23.7		55.0	5.1	≥2	≥2
GOT1	aspartate aminotransferase, cytoplasmic	17.92	5	13.9	126	46.2	7.2	≥2	≥2
DARS	Aspartyl-tRNA synthetase, cytoplasmic	2.39	1	2.9		47.8	6.3	1	1
ABCF1	ATP-binding cassette sub-family F member 1	1.33	1	2.7		93.3	8.8	1	1
DHX9	ATP-dependent RNA helicase A	7.02	8	19.1	148	144.3	6.9	≥2	≥2
DDX1	ATP-dependent RNA helicase DDX1	3.42	2	5.6		64.9	7.0	≥2	≥2
DDX39A	ATP-dependent RNA helicase DDX39	6.60	3	7.6	60	48.7	5.8	1	≥2
BANF1	barrier-to-autointegration factor	13.48	1	2.7		10.1	6.1	1	1
HSPG2	basement membrane-specific heparan sulfate proteoglycan core protein	25.07	77	394.9	2741	471.6	6.5	≥2	≥2
BSG	Basigin	4.02	1	2.6		27.4	5.9	1	1
B4GALT1	Beta-1,4-galactosyltransferase 1	9.69	3	7.5	43	30.1	8.9	≥2	≥2
GLB1	Beta-galactosidase	18.15	9	42.5	287	73.6	6.9	≥2	≥2
GUSB	beta-glucuronidase	18.36	9	34.9	227	74.8	6.8	≥2	≥2
HEXA	beta-hexosaminidase subunit alpha	23.30	10	35.1	163	60.6	6.5	≥2	≥2
HEXB	Beta-hexosaminidase subunit beta	10.30	4	10.1	47	49.0	6.6	≥2	≥2

ATIC	bifunctional purine biosynthesis protein PURH	6.08	3	8.3	71	64.6	7.0	≥2	≥2
BLVRA	Biliverdin reductase A	4.75	1	4.3	81	33.2	5.9	1	1
BTD	biotinidase	10.61	4	15.3	169	60.1	6.1	1	≥2
BMP1	bone morphogenetic protein 1	35.67	26	113.4	334	106.1	7.2	≥2	≥2
BDNF	brain-derived neurotrophic factor	6.42	1	3.2		20.7	6.4	1	1
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	6.52	5	17.3	147	101.2	7.8	≥2	≥2
P15156	Calcium-dependent serine proteinase	47.05	20	91.1	309	77.4	4.8	≥2	≥2
CALM1	Calmodulin	35.40	6	21.1	194	18.2	4.3	≥2	≥2
CNN2	Calponin-2	9.30	2	6.1	51	32.7	7.6	≥2	1
CALR	Calreticulin	43.88	14	62.2	413	48.2	4.5	≥2	≥2
CLSTN1	calsyntenin-1	28.19	22	97.9	441	107.6	4.9	≥2	≥2
CALU	calumenin	30.16	6	30.8	212	37.0	4.7	≥2	≥2
CAPRIN1	Caprin-1	3.35	2	5.8	73	73.6	5.2	≥2	≥2
CAT	catalase	16.51	7	25.0	190	60.0	7.7	≥2	≥2
CTSB	Cathepsin B	48.08	16	100.7	655	37.4	6.1	≥2	≥2
CTSD	cathepsin D	41.18	11	39.4	262	44.1	7.0	≥2	≥2
CTSL1	Cathepsin L1	47.15	12	92.5	759	37.2	7.2	≥2	≥2
IGF2R	Cation-independent mannose-6-phosphate receptor	5.12	7	25.9	115	186.5	5.4	≥2	≥2
ALCAM	CD166 antigen	6.00	3	9.3	127	65.0	6.3	≥2	≥2
CD63	CD63 antigen	4.31	1	3.0	43	25.5	7.6	1	1
CLN5	Ceroid-lipofuscinosis neuronal protein 5	18.54	5	16.4	86	35.4	7.1	≥2	≥2
CHMP4B	Charged multivesicular body protein 4b	5.26	1	3.1		21.4	4.7	1	1
CLIC1	Chloride intracellular channel protein 1	38.59	8	29.7	212	26.9	5.1	≥2	≥2
CLIC4	Chloride intracellular channel protein 4	12.32	2	6.1	49	24.1	6.4	≥2	≥2
CSPG4	chondroitin sulfate proteoglycan 4	15.45	24	97.5	707	251.9	5.7	≥2	≥2
CBX1	chromobox protein homolog 1	14.59	2	7.7	89	21.4	4.9	≥2	≥2
CBX3	chromobox protein homolog 3	16.39	2	11.1	104	20.8	5.3	≥2	≥2
CLTC	Clathrin heavy chain 1	1.19	2	6.3	65	191.4	5.7	≥2	≥2
CLU	Clusterin	43.42	20	221.0	1448	52.6	6.0	≥2	≥2
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2,3-sialyltransferase 1	23.17	2	6.7		9.6	10.1	≥2	≥2
ARCN1	coatomer subunit delta	2.15	1	2.9	57	57.2	6.2	1	1
CFL1	cofilin-1	59.04	10	75.4	346	18.5	8.1	≥2	≥2
CCDC80	Coiled-coil domain-containing protein 80	14.99	9	42.3	237	105.6	10.1	≥2	≥2
CIRBP	Cold-inducible RNA-binding protein	5.98	1	3.5	53	19.8	9.6	1	1
COL5A1	Collagen alpha-1(V) chain	32.71	6	28.1	113	34.4	5.2	≥2	≥2
COL6A1	Collagen alpha-1(VI) chain	26.28	17	81.9	465	88.9	6.6	≥2	≥2
COL5A2	collagen alpha-2(V) chain	4.40	5	18.2	115	145.0	6.0	≥2	≥2
C1ra	Complement C1r-A subcomponent	24.40	12	48.2	389	80.0	6.1	≥2	≥2
C3	Complement C3	21.59	27	93.1	702	182.1	6.7	≥2	≥2

COPS4	COP9 signalosome complex subunit 4	2.96	1	2.7		46.3	5.8	1	1
CORO1B	coronin-1B	9.50	4	9.2	62	53.8	5.8	≥2	≥2
CORO1C	Coronin-1C	1.68	1	2.3		53.2	7.1	1	1
ABRACL	costars family protein C6orf115 homolog	11.11	1	3.5	52	9.0	5.8	1	1
CAND1	Cullin-associated NEDD8-dissociated protein 1	2.89	3	9.6	95	134.2	5.8	≥2	≥2
ATF6	Cyclic AMP-dependent transcription factor ATF-6 beta	1.63	1	6.9	69	73.4	7.7	1	1
CSTB	Cystatin-B	33.67	2		63	11.1	7.4	≥2	≥2
CSRP1	Cysteine and glycine-rich protein 1	21.21	3	8.4	119	21.0	8.7	≥2	≥2
CRIP2	Cysteine-rich protein 2	9.25	2	6.5	56	24.6	8.8	≥2	≥2
Cycs	Cytochrome c, somatic	58.72	7	44.6	311	12.0	9.7	≥2	≥2
LAP3	Cytosol aminopeptidase	5.19	2	6.1	48	50.2	6.9	≥2	≥2
CNDP2	cytosolic non-specific dipeptidase	10.11	4	14.3	136	52.8	5.9	≥2	≥2
PHGDH	D-3-phosphoglycerate dehydrogenase	4.04	2	6.0	96	54.7	9.6	≥2	≥2
DDT	D-dopachrome decarboxylase	30.51	3	7.5	85	13.1	7.1	≥2	≥2
DCN	Decorin	50.00	15	116.9	744	40.1	8.2	≥2	≥2
DNASE2	Deoxyribonuclease-2-alpha	18.47	5	18.3	156	38.4	7.3	≥2	≥2
DSTN	Destrin	40.00	5	19.3	134	18.6	7.7	≥2	≥2
DKK3	Dickkopf-related protein 3	38.51	10	56.5	228	38.3	4.5	≥2	≥2
DPP7	Dipeptidyl peptidase 2	24.47	9	31.6	184	53.1	6.6	≥2	≥2
DPP3	Dipeptidyl peptidase 3	2.44	2	2.7	46	82.9	5.2	≥2	≥2
ADAM10	disintegrin and metalloproteinase domain-containing protein 10	9.80	5	18.7	85	83.8	7.8	≥2	≥2
ADAM15	Disintegrin and metalloproteinase domain-containing protein 15	16.95	3	11.4	108	45.4	5.0	≥2	≥2
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	7.02	3	8.8	51	59.7	6.1	≥2	≥2
ADAM9	disintegrin and metalloproteinase domain-containing protein 9	2.31	2	5.6	82	91.2	6.6	≥2	≥2
DDB1	DNA damage-binding protein 1	0.88	1	2.9		126.8	5.2	1	1
APEX1	DNA-(apurinic or apyrimidinic site) lyase	3.47	1	2.9		35.5	8.4	1	1
N/A	DNA-binding protein A	15.86	1	8.8	139	25.4	10.4	1	1
DNAJC8	DnaJ homolog subfamily C member 8	3.95	1	2.9		29.8	9.2	1	1
DAG1	Dystroglycan	11.87	9	41.1	349	96.8	8.5	≥2	≥2
NEDD4	E3 ubiquitin-protein ligase NEDD4	2.24	2	5.9	61	97.7	5.4	≥2	≥2
EML2	Echinoderm microtubule-associated protein-like 2	5.32	2	5.0	43	39.0	6.4	≥2	≥2
EFHD2	EF-hand domain-containing protein D2	20.86	2	3.5	89	15.9	5.3	≥2	≥2
EFEMP2	EGF-containing fibulin-like extracellular matrix protein 2	20.00	6	21.6	56	42.0	5.4	≥2	≥2
EEF1A1	elongation factor 1-alpha 1	42.42	13	71.7	361	50.1	9.0	≥2	≥2
EEF1B2	Elongation factor 1-beta	23.11	3	20.1	138	24.8	4.6	≥2	≥2
EEF1G	elongation factor 1-gamma	38.90	15	55.4	377	50.0	6.8	≥2	≥2
EEF2	elongation factor 2	40.79	28	123.6	484	95.3	6.8	≥2	≥2
HSP90B1	Endoplasmin	38.98	26	105.1	767	92.6	4.8	≥2	≥2
NPC2	Epididymal secretory protein E1	29.53	5	36.7		16.5	8.0	≥2	≥2

MAN2B2	Epididymis-specific alpha-mannosidase	1.44	1	4.4	40	111.3	7.5	1	1
SGCE	Epsilon-sarcoglycan	3.05	1	2.4		37.1	6.7	1	1
EIF4A1	Eukaryotic initiation factor 4A-I	14.29	5	18.0	191	46.1	5.5	≥2	≥2
EIF4A2	eukaryotic initiation factor 4A-II	11.79	4	14.8	124	46.4	5.5	1	≥2
EIF4A3	Eukaryotic initiation factor 4A-III	3.58	1	2.5		32.4	7.0	1	1
EIF1B	Eukaryotic translation initiation factor 1b	12.39	1	3.9	81	12.8	7.4	1	1
EIF2S1	Eukaryotic translation initiation factor 2 subunit 1	12.70	3	10.5	125	36.1	5.2	≥2	≥2
EIF2S3	Eukaryotic translation initiation factor 2 subunit 3	6.78	2	8.5		51.1	8.5	≥2	≥2
EIF3B	eukaryotic translation initiation factor 3 subunit B	4.37	2	8.3	67	91.4	5.1	≥2	≥2
EIF3E	Eukaryotic translation initiation factor 3 subunit E	3.42	1	2.4		30.7	6.9	1	1
EIF3G	Eukaryotic translation initiation factor 3 subunit G	11.25	3	9.3	44	35.7	5.9	≥2	≥2
EIF3I	Eukaryotic translation initiation factor 3 subunit I	3.69	1	2.8		36.3	5.6	1	1
EIF3J	Eukaryotic translation initiation factor 3 subunit J	16.20	4	12.6		24.7	4.7	≥2	≥2
EIF3L	Eukaryotic translation initiation factor 3 subunit L	1.77	1	2.3		66.6	6.3	1	1
EIF4B	Eukaryotic translation initiation factor 4B	5.43	3	6.6	85	68.6	6.0	≥2	≥2
EIF5A	Eukaryotic translation initiation factor 5A-1	56.84	3	19.1	87	10.5	4.5	≥2	≥2
EIF6	eukaryotic translation initiation factor 6	13.06	2	9.7	60	26.6	4.7	≥2	≥2
EXT2	Exostosin-2	3.00	2	5.6	40	80.1	6.6	≥2	≥2
EXT2	Exostosin-like 2	13.92	4	8.7	99	35.7	8.6	≥2	≥2
XPO1	exportin-1	2.05	1	5.0		122.9	6.1	1	1
CSE1L	Exportin-2	7.62	5	19.6	70	110.3	5.8	≥2	≥2
ECM1	Extracellular matrix protein 1	1.60	1	2.5		63.1	6.8	1	1
EZR	Ezrin	14.51	3	30.7	161	69.3	6.4	≥2	≥2
CAPZA1	F-actin-capping protein subunit alpha-1	17.17	3	10.5	133	26.8	6.7	≥2	≥2
CAPZB	F-actin-capping protein subunit beta	19.38	4	6.6	149	29.0	7.7	≥2	≥2
FASN	fatty acid synthase	2.36	5	14.8	122	271.7	6.4	≥2	≥2
FABP4	Fatty acid-binding protein, adipocyte	31.06	4	20.0	218	14.7	7.9	≥2	≥2
FTH1	Ferritin heavy chain	38.17	7	16.7	186	21.5	6.2	≥2	≥2
BLVRB	Flavin reductase	66.02	11	37.8	216	22.1	8.4	≥2	≥2
FSTL1	Follistatin-related protein 1	56.21	14	88.6	229	34.6	5.7	≥2	≥2
LGALS3	Galectin-3	17.24	4	9.6	90	27.2	8.9	≥2	≥2
LGALS3BP	Galectin-3-binding protein	45.82	16	91.0	520	63.8	5.2	≥2	≥2
IFI30	Gamma-interferon-inducible lysosomal thiol reductase	40.47	8	44.7		28.4	5.1	≥2	≥2
GM2A	Ganglioside GM2 activator	32.12	5	25.3		21.0	6.7	≥2	≥2
USO1	General vesicular transport factor p115	1.99	1	3.1	59	84.2	4.9	1	1
G6PD	Glucose-6-phosphate 1-dehydrogenase	8.49	5	17.6	80	71.3	6.5	≥2	≥2
GPI	glucose-6-phosphate isomerase	14.16	6	21.9	193	63.0	7.6	≥2	≥2
GBA	glucosylceramidase	40.00	13	59.6	316	57.4	8.1	≥2	≥2
GCLM	Glutamate--cysteine ligase regulatory subunit	8.39	2	8.1	75	30.6	5.7	≥2	≥2

GSR	Glutathione reductase, mitochondrial	8.10	3	9.7	90	45.9	7.0	≥2	≥2
GSTA4	Glutathione S-transferase A4	22.97	3	12.8	146	25.7	6.8	≥2	≥2
Gsta3	Glutathione S-transferase alpha-3	32.13	8	31.4	291	25.5	8.4	≥2	≥2
GSTM1	Glutathione S-transferase Mu 1	33.03	5	26.0	298	25.5	6.0	≥2	≥2
GSTM5	Glutathione S-transferase Mu 5	34.53	6	33.7	345	26.5	6.4	≥2	≥2
Gstm6	Glutathione S-transferase Mu 6	40.83	7	32.7	358	25.5	6.6	≥2	1
GSTP1	Glutathione S-transferase P 2	16.99	2	9.6	141	23.6	7.0	≥2	≥2
GSTT2	Glutathione S-transferase theta-2	7.25	1		45	23.4	6.9	1	1
Q00285	Glutathione S-transferase Y1	50.46	12	42.4	406	25.8	6.4	≥2	≥2
GSS	Glutathione synthetase	22.66	7	22.0	118	30.9	6.0	≥2	≥2
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	48.97	13	109.1	853	36.3	8.5	≥2	≥2
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	25.49	4	16.0	121	29.6	9.4	≥2	≥2
NMT2	Glycylpeptide N-tetradecanoyltransferase 2	8.48	1	4.9	90	19.0	5.7	1	1
GARS	glycyl-tRNA synthetase	1.55	1	4.1	61	79.8	6.8	1	1
GPC1	Glypican-1	19.16	3	10.7		23.2	8.1	≥2	≥2
GPR56	G-protein coupled receptor 56	1.45	1	2.8	59	77.3	8.8	1	1
RAN	GTP-binding nuclear protein Ran	28.90	7	27.0	139	24.5	7.5	≥2	≥2
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	6.47	2	5.7		37.3	6.0	≥2	≥2
GNB1	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	3.57	1	4.8		30.5	5.2	1	1
GNB2L1	Guanine nucleotide-binding protein subunit beta-2-like 1	53.31	12	52.1	247	35.1	7.7	≥2	≥2
HSPA13	Heat shock 70 kDa protein 13	24.42	10	38.6	258	51.9	6.7	≥2	≥2
HSPA4	Heat shock 70 kDa protein 4	27.43	16	61.7	403	93.4	5.2	≥2	1
HSPA8	heat shock cognate 71 kDa protein	50.31	25	126.6	1013	70.8	5.4	≥2	≥2
HSPH1	Heat shock protein 105 kDa	1.29	1	5.0		87.9	5.8	1	1
HSP90AB1	Heat shock protein HSP 90-beta	48.33	2	16.6		7.3	9.3	≥2	≥2
HMOX1	Heme oxygenase 1	20.63	4	11.4	129	32.5	6.6	≥2	≥2
HEBP1	Heme-binding protein 1	8.42	1		44	21.2	5.3	1	1
HPSE	heparanase	1.86	1	2.4	50	60.9	9.0	1	1
HDGF	Hepatoma-derived growth factor	9.27	1	5.5		22.7	4.6	1	1
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	27.01	6	23.1	239	23.7	9.6	≥2	≥2
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	33.44	8	29.4	275	34.1	9.2	≥2	≥2
HNRNPA3	Heterogeneous nuclear ribonucleoprotein A3	23.84	8	34.3	239	32.2	9.0	≥2	≥2
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	22.03	5	18.4	162	25.6	8.6	≥2	≥2
HNRNPF	Heterogeneous nuclear ribonucleoprotein F	16.35	4	25.6	118	45.8	5.6	≥2	1
RBMX	Heterogeneous nuclear ribonucleoprotein G	6.70	2	7.8	87	42.1	10.0	≥2	≥2
HNRNPL	heterogeneous nuclear ribonucleoprotein L	7.23	3	7.0	41	54.2	5.6	≥2	≥2
HNRNPU	heterogeneous nuclear ribonucleoprotein U	6.46	3	11.2	56	69.8	8.9	≥2	≥2
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	26.33	6	21.1	237	32.3	9.1	≥2	≥2
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	21.43	6	17.1	223	35.4	5.1	≥2	1

HMGB1	High mobility group protein B1	36.67	6	28.6	163	27.8	6.3	≥2	≥2
HMGB2	High mobility group protein B2	5.03	1	2.6		18.2	5.4	1	1
HMGA1	High mobility group protein HMG-I/HMG-Y	19.79	1		77	10.6	10.3	1	1
H1F0	Histone H1.0	21.13	4	13.9	106	20.9	10.9	≥2	≥2
H2AFX	Histone H2A.x	27.27	2	25.0	120	15.1	10.9	≥2	1
HIST1H4A	Histone H4	31.16	6	30.6	257	21.8	10.7	≥2	≥2
RBBP7	Histone-binding protein RBBP7	9.01	4	11.6		49.9	5.3	≥2	≥2
ST13	Hsc70-interacting protein	18.55	2	5.5	48	13.9	6.8	≥2	≥2
CDC37	Hsp90 co-chaperone Cdc37	5.28	2	5.9	52	44.1	6.0	≥2	≥2
HMGCS1	hydroxymethylglutaryl-CoA synthase, cytoplasmic-like	4.62	2	5.4		57.3	5.7	1	≥2
HPRT1	Hypoxanthine-guanine phosphoribosyltransferase	27.06	5	17.7	122	24.6	7.0	≥2	≥2
HYOU1	Hypoxia up-regulated protein 1	13.91	10	36.3	195	111.4	5.2	≥2	≥2
KPNB1	Importin subunit beta-1	11.42	7	24.0	237	97.1	4.8	≥2	≥2
IPO4	importin-4	1.02	1	2.2		118.5	5.0	1	1
IPO5	Importin-5	11.12	10	37.9	239	123.5	4.9	≥2	1
PRSS35	inactive serine protease 35-like	8.25	2	8.6	95	46.0	9.7	1	≥2
PPA1	Inorganic pyrophosphatase	41.42	8	33.3	192	34.9	5.6	≥2	≥2
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	2.33	1	3.7	60	55.9	7.3	1	1
ISYNA1	Inositol-3-phosphate synthase 1	2.33	1	3.0	41	46.9	5.7	1	1
IGFBP4	Insulin-like growth factor-binding protein 4	25.00	4	16.0	59	20.5	7.8	≥2	≥2
ITIH5	Inter-alpha-trypsin inhibitor heavy chain H5	40.86	31	140.9	887	106.5	8.3	≥2	≥2
ILF2	interleukin enhancer-binding factor 2	9.23	3	10.8	117	43.0	5.3	≥2	≥2
ILF3	Interleukin enhancer-binding factor 3	6.25	2	5.2	47	32.0	9.7	≥2	≥2
IL1RAP	Interleukin-1 receptor accessory protein	5.83	2	5.3	53	41.7	6.5	≥2	≥2
IAH1	isoamyl acetate-hydrolyzing esterase 1 homolog	6.02	1	2.5		27.8	5.7	1	1
IDI1	Isopentenyl-diphosphate Delta-isomerase 1	4.48	1	2.9		30.8	6.9	1	1
MFGE8	Lactadherin	46.14	16	84.5	676	47.1	7.9	≥2	≥2
GLO1	Lactoylglutathione lyase	25.32	3	12.1	155	17.6	5.1	≥2	≥2
LAMB1	Laminin subunit beta-1	40.02	55	328.7	1808	202.0	4.9	≥2	≥2
LAMC1	laminin subunit gamma-1	42.14	50	301.9	2120	172.0	5.1	≥2	≥2
LTBP1	Latent-transforming growth factor beta-binding protein 1	11.32	6	25.8	104	93.7	4.5	≥2	≥2
LXN	Latexin	5.41	1	3.9	71	25.4	6.3	1	1
MESDC2	LDLR chaperone MESD	4.42	1	5.4		25.1	6.3	1	1
LGMN	legumain	46.80	14	131.9	611	49.6	6.6	≥2	≥2
LIFR	Leukemia inhibitory factor	30.65	6	37.4	173	21.6	9.0	≥2	≥2
SERPINB1	leukocyte elastase inhibitor A	19.53	6	19.8	169	42.9	6.2	≥2	≥2
LASP1	LIM and SH3 domain protein 1	34.36	7	21.5	116	25.8	5.9	≥2	≥2
LPL	Lipoprotein lipase	57.56	20	178.0	1360	50.5	7.9	≥2	≥2
LDHA	L-lactate dehydrogenase A chain	64.76	16	93.6	539	36.5	7.4	≥2	≥2

ACP1	Low molecular weight phosphotyrosine protein phosphatase	8.57	1	3.0		11.5	5.9	1	1
GAA	Lysosomal alpha-glucosidase	33.02	20	95.2	713	106.0	6.0	≥2	≥2
MAN2B1	lysosomal alpha-mannosidase	5.25	4	17.8	234	113.9	7.9	≥2	≥2
LOXL1	Lysyl oxidase homolog 1	4.23	1	5.4	76	36.9	6.4	1	1
LOXL3	lysyl oxidase homolog 3	6.52	4	13.4	58	83.1	6.9	≥2	≥2
MIF	Macrophage migration inhibitory factor	23.48	3	4.9	112	12.4	7.3	≥2	≥2
CAPG	Macrophage-capping protein	29.80	7	28.8	223	38.7	6.6	≥2	≥2
MDP1	Magnesium-dependent phosphatase 1	8.13	1	3.4		17.9	6.3	1	1
PRNP	Major prion protein	9.16	1	4.1		15.3	6.8	1	1
MDH1	Malate dehydrogenase, cytoplasmic	26.43	7	19.2	107	36.3	6.6	≥2	≥2
MAMDC2	MAM domain-containing protein 2	14.72	9	29.2	143	77.5	5.3	≥2	≥2
MAN1A1	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IA	16.26	6	17.8	246	56.0	6.5	≥2	≥2
MMP14	Matrix metalloproteinase-14	1.67	1	2.4		60.7	8.5	1	1
MMP19	matrix metalloproteinase-19	53.52	18	87.5	696	58.9	7.9	≥2	≥2
MMP9	matrix metalloproteinase-9	24.37	14	67.4	420	78.8	5.9	≥2	≥2
MBTPS1	Membrane-bound transcription factor site-1 protease	1.05	1	3.0		117.5	8.8	1	1
MANF	Mesencephalic astrocyte-derived neurotrophic factor	6.45	1	4.3		24.6	8.5	1	1
TIMP1	Metalloproteinase inhibitor 1	50.00	8	76.5	424	23.7	8.2	≥2	≥2
TIMP2	Metalloproteinase inhibitor 2	36.13	5	20.7	130	21.5	7.5	≥2	≥2
WDR77	Methylosome protein 50	5.30	1	9.3		29.8	4.8	1	1
CLNS1A	Methylosome subunit pICln	5.44	1	4.0	55	26.3	4.1	1	1
eb1	Microtubule-associated protein RP/EB family member 1	7.46	1		43	30.0	5.2	1	1
TOMM22	mitochondrial import receptor subunit TOM22 homolog	8.45	1	4.5	76	15.5	4.3	1	1
MAPK1	Mitogen-activated protein kinase 1	5.07	2	7.1	41	41.0	7.0	≥2	1
MSN	moesin	22.26	12	39.0	293	66.5	6.3	≥2	≥2
PAICS	Multifunctional protein ADE2	12.64	1	2.9	64	9.5	7.9	1	1
MINPP1	Multiple inositol polyphosphate phosphatase 1	10.57	3	12.6		40.3	6.4	≥2	≥2
MYBBP1A	Myb-binding protein 1A	3.33	2	8.1	96	105.1	9.1	≥2	≥2
MYL6	Myosin light polypeptide 6	33.77	4	10.8	143	16.9	4.7	≥2	≥2
MTPN	Myotrophin	14.78	1	3.2	42	12.5	5.8	1	1
GNPTG	N-acetylglucosamine-1-phosphotransferase subunit gamma	35.50	8	32.2	265	34.2	6.9	≥2	≥2
GNS	N-acetylglucosamine-6-sulfatase	22.78	7	22.9	195	53.7	6.9	≥2	≥2
B3GNT1	N-acetyllactosaminide beta-1,3-N-acetylglucosaminyltransferase	8.43	3	10.1	75	47.5	7.5	≥2	≥2
NACA	Nascent polypeptide-associated complex subunit alpha	25.58	4	17.4	198	23.4	4.6	≥2	≥2
NEO1	Neogenin	4.34	6	14.9	135	154.4	6.6	≥2	≥2
NCAM1	neural cell adhesion molecule 1	6.22	6	23.3	165	122.1	4.8	≥2	≥2
NRP1	neuropilin-1	1.41	1	3.3	56	103.0	5.9	1	1
NPTN	neuroplastin	2.68	1	2.4		42.4	8.2	1	1
SERPINI1	Neuroserpin	8.15	2	4.8		26.6	4.9	≥2	≥2

SLC1A4	Neutral amino acid transporter A	1.88	1	3.0		56.3	5.6	1	1
NHLRC3	NHL repeat-containing protein 3	8.07	3	4.7	49	38.0	6.0	≥2	≥2
NHP2L1	NHP2-like protein 1-like	17.42	2	5.7	49	14.6	8.1	≥2	1
NAMPT	Nicotinamide phosphoribosyltransferase	15.89	4	14.9	110	55.4	7.1	≥2	≥2
NID1	Nidogen-1	60.24	45	397.1	2801	136.1	5.1	≥2	≥2
Cald1	Non-muscle caldesmon	8.57	4	16.4	62	61.6	8.6	≥2	≥2
NONO	non-POU domain-containing octamer-binding protein	6.10	2	5.7	51	48.9	8.0	≥2	≥2
SGSH	N-sulphoglucosamine sulphohydrolase-like	10.16	4	12.5	97	56.5	6.5	1	≥2
NASP	Nuclear autoantigenic sperm protein	1.30	1	2.8		83.3	4.4	1	1
NUDC	Nuclear migration protein nudC	11.35	3	8.1		32.8	6.0	≥2	≥2
NUTF2	Nuclear transport factor 2	11.02	1	3.1		14.5	5.4	1	1
YBX1	Nuclease-sensitive element-binding protein 1	40.69	6	29.2	313	32.7	10.1	≥2	≥2
NUCB1	Nucleobindin-1	48.30	14	66.4	503	38.2	5.7	≥2	≥2
NUCB2	Nucleobindin-2	57.66	18	92.3	727	50.0	5.1	≥2	≥2
NCL	nucleolin	27.17	17	72.6	583	82.3	4.7	≥2	≥2
NPM1	Nucleophosmin	20.36	4	15.5	154	31.0	4.7	≥2	≥2
NME2	Nucleoside diphosphate kinase B	52.60	5	33.3	288	17.6	8.8	≥2	≥2
NAP1L1	Nucleosome assembly protein 1-like 1	22.08	3	12.7	120	27.1	4.7	≥2	≥2
NAP1L4	Nucleosome assembly protein 1-like 4	14.77	4	15.7	86	43.9	4.7	≥2	≥2
NUDCD2	NudC domain-containing protein 2	5.73	1	2.6	40	17.7	4.9	1	1
OLA1	Obg-like ATPase 1	6.06	2	7.8	136	44.7	7.5	≥2	1
OLFML1	Olfactomedin-like protein 3	39.90	14	58.6	224	45.9	6.2	≥2	≥2
NIT2	Omega-amidase NIT2	3.62	1	2.5		30.5	7.4	1	1
OSTF1	Osteoclast-stimulating factor 1	5.61	1	2.8		23.7	5.9	1	1
OAF	Out at first protein homolog	47.09	9	56.0	287	23.8	8.0	≥2	≥2
PPT1	Palmitoyl-protein thioesterase 1	31.05	6	20.0	208	34.5	7.6	≥2	≥2
VNN1	pantetheinase	12.89	5	18.7	187	56.7	5.6	≥2	≥2
PDLIM1	PDZ and LIM domain protein 1	3.65	1	3.4		35.9	7.2	1	1
PPIA	Peptidyl-prolyl cis-trans isomerase A	67.68	10	40.9	296	17.9	8.3	≥2	≥2
PPIB	Peptidyl-prolyl cis-trans isomerase B	56.02	13	48.0	461	23.6	9.7	≥2	≥2
PPIC	Peptidyl-prolyl cis-trans isomerase C	48.13	4	17.1	143	17.5	6.4	≥2	≥2
FKBP1A	Peptidyl-prolyl cis-trans isomerase FKBP1A	40.74	3	10.2	123	11.9	8.7	≥2	1
FKBP9	Peptidyl-prolyl cis-trans isomerase FKBP9	1.58	1	2.4		63.0	5.1	1	1
PXDN	peroxidasin homolog	54.17	54	320.6	1550	165.3	7.0	≥2	≥2
PRDX1	Peroxiredoxin-1	73.87	17	117.6	700	22.2	7.7	≥2	≥2
PRDX4	peroxiredoxin-4-like	8.50	2	13.7	144	38.8	8.4	1	≥2
PEBP1	Phosphatidylethanolamine-binding protein 1	62.03	8	28.9	283	20.9	7.1	≥2	≥2
PITPNA	Phosphatidylinositol transfer protein alpha isoform	25.00	4	15.3	84	30.9	6.6	≥2	1
PGM1	Phosphoglucomutase-1	2.10	1	3.6	79	62.8	5.9	1	1

PGM2	phosphoglucomutase-2	2.10	1	3.4	80	69.0	6.3	1	1
PGK1	phosphoglycerate kinase 1	64.51	18	80.5	581	44.5	7.9	≥2	≥2
PGAM1	Phosphoglycerate mutase 1	37.01	7	28.5	164	28.8	6.9	≥2	≥2
PLTP	phospholipid transfer protein	32.05	11	40.9	209	54.3	6.7	≥2	≥2
PMM2	Phosphomannomutase 2	4.56	1	2.7		27.5	6.6	1	1
PPCS	phosphopantothenate--cysteine ligase-like	6.75	2	6.4	58	33.8	7.1	1	≥2
PSPH	Phosphoserine phosphatase	6.38	1	2.4		15.7	6.2	1	1
SERPINF1	Pigment epithelium-derived factor	43.30	15	72.0	557	46.4	6.9	≥2	≥2
PIR	Pirin	12.07	3	6.2	96	32.1	6.5	≥2	1
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	6.39	2	9.5	69	44.1	10.3	≥2	1
PLS3	plastin-3	12.06	6	21.6	177	70.8	5.7	≥2	≥2
PLA2G7	Platelet-activating factor acetylhydrolase	32.07	8	39.8	307	38.2	8.7	≥2	≥2
PAFAH1B3	Platelet-activating factor acetylhydrolase IB subunit gamma	3.95	1	2.9	54	25.5	8.6	1	1
PDGFC	platelet-derived growth factor C	4.93	2	5.2		38.7	6.8	1	≥2
PCBP2	Poly(rC)-binding protein 2	13.71	3	11.4	69	33.8	8.0	≥2	1
PABPC1	Polyadenylate-binding protein 1	11.33	4	15.3	103	62.7	9.6	≥2	≥2
GALNT2	polypeptide N-acetylgalactosaminyltransferase 2	14.95	7	26.8	149	60.9	7.9	≥2	≥2
PFDN1	Prefoldin subunit 1	9.02	1	3.6	62	14.2	6.8	1	1
PFDN2	Prefoldin subunit 2	11.69	1		45	8.4	8.2	1	1
PFDN6	prefoldin subunit 6	7.87	1	2.6		14.4	8.9	1	1
PCOLCE	Procollagen C-endopeptidase enhancer 1	58.76	19	132.1	642	50.4	7.9	≥2	≥2
PLOD1	Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1	40.44	22	95.9	990	83.7	6.6	≥2	≥2
PLOD3	procollagen-lysine,2-oxoglutarate 5-dioxygenase 3	7.75	4	16.3	149	75.6	6.5	≥2	≥2
PFN1	Profilin-1	59.29	7	21.7	161	14.9	8.3	≥2	≥2
PFN2	Profilin-2	12.79	2		78	18.4	7.6	≥2	1
PDCD6IP	Programmed cell death 6-interacting protein	3.30	2	5.7		70.2	6.5	≥2	≥2
PA2G4	Proliferation-associated protein 2G4	28.30	8	32.8	150	41.1	8.0	≥2	≥2
PTGES3	Prostaglandin E synthase 3	13.75	2	6.1	65	18.7	4.6	≥2	≥2
PTGFRN	Prostaglandin F2 receptor negative regulator	17.83	15	45.1	221	93.7	6.6	≥2	≥2
PTGR1	Prostaglandin reductase 1	27.96	7	32.7	250	35.7	8.0	≥2	≥2
PSME1	Proteasome activator complex subunit 1	35.32	8	26.1	201	28.9	6.0	≥2	≥2
PSMA1	Proteasome subunit alpha type-1	10.27	2	6.2	47	29.5	6.4	≥2	≥2
PSMA2	proteasome subunit alpha type-2	32.48	5	20.1	99	25.9	7.4	≥2	≥2
PSMA3	Proteasome subunit alpha type-3	12.94	3	5.8	100	28.4	5.3	≥2	≥2
PSMA4	Proteasome subunit alpha type-4	14.56	2	8.6		29.5	7.3	≥2	≥2
PSMA5	proteasome subunit alpha type-5	22.82	4	16.2	65	26.4	4.8	≥2	≥2
PSMA7	Proteasome subunit alpha type-7	34.41	6	21.5	154	27.8	8.8	≥2	≥2
PSMB1	Proteasome subunit beta type-1	22.86	2	8.1	77	15.6	8.1	≥2	≥2
PSMB2	Proteasome subunit beta type-2	4.98	1	2.7	53	22.8	7.9	1	1

PSMB3	Proteasome subunit beta type-3	46.15	2	10.8	102	5.7	9.0	≥2	≥2
PSMB4	Proteasome subunit beta type-4	14.02	2	3.7	94	29.1	5.6	≥2	≥2
PSMB5	Proteasome subunit beta type-5	3.80	1	2.9	45	28.7	7.0	1	1
PSMB6	Proteasome subunit beta type-6	13.03	3	8.7	108	25.2	4.9	≥2	≥2
PSMB7	Proteasome subunit beta type-7	12.22	2		67	19.2	8.2	≥2	≥2
PSMB8	Proteasome subunit beta type-8	10.96	2	7.8	65	25.5	7.1	≥2	≥2
PRMT5	Protein arginine N-methyltransferase 5	1.73	1	3.6	41	66.3	5.7	1	1
CUTA	Protein CutA	9.79	1	3.5		15.4	5.5	1	1
CYR61	protein CYR61	16.40	6	19.6	43	41.5	8.1	≥2	≥2
P4hb	Protein disulfide-isomerase	37.55	16	51.4	357	54.2	4.9	≥2	≥2
PDIA3	Protein disulfide-isomerase A3	47.97	22	95.9	753	55.4	6.2	≥2	≥2
PDIA4	protein disulfide-isomerase A4	23.52	13	46.1	269	72.5	5.2	≥2	≥2
PDIA6	Protein disulfide-isomerase A6	40.00	12	72.1	647	48.7	5.2	≥2	≥2
PARK7	Protein DJ-1	33.86	4	12.5	164	19.9	7.3	≥2	≥2
FAM3C	Protein FAM3C	40.69	7	31.0	299	25.2	8.7	≥2	≥2
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	1.16	1	3.0	48	115.1	5.4	1	1
PPM1G	Protein phosphatase 1G	8.06	3	9.1	67	54.0	4.3	≥2	≥2
PPP1R2	Protein phosphatase inhibitor 2	13.46	2	8.3		17.6	4.6	≥2	≥2
S100A11	Protein S100-A11	26.21	2	7.1	57	11.5	7.9	≥2	≥2
S100A13	Protein S100-A13	45.92	5	16.9	148	11.2	5.3	≥2	≥2
S100A6	protein S100-A6	19.10	3	22.0	118	10.0	5.5	≥2	≥2
SET	Protein SET	38.06	8	31.7	239	33.3	4.3	≥2	≥2
SHISA5	protein shisa-5-like	12.81	3	25.4	52	25.9	6.5	1	≥2
PCMT1	Protein-L-isoaspartate(D-aspartate) O-methyltransferase	3.86	1	2.8		30.3	8.0	1	1
TPST1	Protein-tyrosine sulfotransferase 1	2.97	1	6.6		42.1	9.1	1	1
FAT1	Protocadherin Fat 1	3.50	2	8.0	67	85.1	5.1	≥2	≥2
PCDHGC3	Protocadherin gamma-C3	10.10	3	9.6	51	43.5	4.6	≥2	≥2
PNP	Purine nucleoside phosphorylase	20.14	4	18.6	206	31.4	6.7	≥2	≥2
PLBD2	putative phospholipase B-like 2	41.88	16	82.4	430	65.5	6.3	≥2	≥2
DHX15	Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	1.37	1	2.8		82.8	7.1	1	1
RBM3	Putative RNA-binding protein 3	47.44	4	12.0	166	17.0	8.4	≥2	≥2
PDXK	Pyridoxal kinase	8.63	2	2.8	77	34.9	5.8	≥2	1
GDI2	Rab GDP dissociation inhibitor beta	31.69	10	41.6	247	50.5	6.5	≥2	≥2
RDX	radixin	13.04	3	28.2	197	68.5	6.3	≥2	≥2
RANBP1	Ran-specific GTPase-activating protein	21.65	4	13.5	109	22.6	5.2	≥2	≥2
G3BP1	ras GTPase-activating protein-binding protein 1	3.66	1	4.0	62	51.8	5.6	1	1
IQGAP1	ras GTPase-activating-like protein IQGAP1	3.26	5	15.7	78	188.8	6.5	≥2	≥2
IQGAP2	Ras GTPase-activating-like protein IQGAP2	0.58	1	2.3		177.8	5.6	1	1
RAB10	Ras-related protein Rab-10	16.50	3	8.6	69	22.6	8.5	≥2	≥2

PTPRZ1	Receptor-type tyrosine-protein phosphatase zeta	1.88	3	11.2	114	251.3	4.8	≥2	≥2
ATP6AP2	Renin receptor	31.71	8	32.3	311	39.1	5.3	≥2	≥2
RPA1	Replication protein A 70 kDa DNA-binding subunit	6.79	3	9.7	41	68.5	7.9	≥2	1
RCN1	Reticulocalbin-1	7.72	2	5.8	40	29.3	4.7	≥2	≥2
RCN3	Reticulocalbin-3	17.51	4	12.9	116	34.4	4.9	≥2	≥2
RARRES2	Retinoic acid receptor responder protein 2	33.13	4	12.1	89	18.7	9.0	≥2	≥2
SCPEP1	retinoid-inducible serine carboxypeptidase	27.25	9	37.8	304	51.2	5.5	≥2	≥2
ARHGDIA	Rho GDP-dissociation inhibitor 1	44.61	6	17.7	143	23.4	5.3	≥2	≥2
RNASE4	Ribonuclease 4	37.41	4	20.1		16.9	9.1	≥2	≥2
RNH1	ribonuclease inhibitor-like	4.82	2	5.7	54	50.0	4.8	1	≥2
RBM8A	RNA-binding protein 8A	21.84	3	10.7	44	19.9	5.7	≥2	≥2
EWSR1	RNA-binding protein EWS	4.12	2	6.7	45	68.4	9.3	≥2	≥2
FUS	RNA-binding protein FUS	12.20	2	10.3	75	21.2	10.0	≥2	≥2
SEMA3B	semaphorin-3B	5.07	3	7.6	46	83.0	8.4	≥2	≥2
SEMA3C	Semaphorin-3C	19.97	13	55.7	512	85.2	8.7	≥2	≥2
SEMA3E	semaphorin-3E	3.86	3	10.3	123	89.5	7.8	≥2	≥2
SEMA4B	semaphorin-4B	6.42	4	8.3	65	91.4	7.8	≥2	≥2
SEPT11	Septin-11	1.41	1		41	49.1	6.8	1	1
SEPT9	septin-9	3.18	1	4.4	102	63.7	8.3	1	1
HTRA1	Serine protease HTRA1	58.01	13	56.0	796	34.1	7.2	≥2	≥2
PPP2R2A	serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform	2.41	1	3.9	56	52.9	6.5	1	1
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	3.28	1	2.9	45	46.0	7.6	1	1
PPP2R1A	Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform	10.86	4	15.5	124	59.0	5.1	≥2	≥2
PPP1CB	Serine/threonine-protein phosphatase PP1-beta catalytic subunit	2.93	1	2.9	41	38.6	6.4	1	1
SERPINH1	Serpin H1	20.86	7	20.2	198	46.5	8.7	≥2	≥2
ESD	S-formylglutathione hydrolase	53.31	8	37.1	103	28.2	6.5	≥2	≥2
SH3BGRL	SH3 domain-binding glutamic acid-rich-like protein	69.30	5	17.5	165	12.7	5.1	≥2	≥2
SH3BGRL3	SH3 domain-binding glutamic acid-rich-like protein 3	13.89	1		55	8.0	6.6	1	1
NEU1	Sialidase-1	18.82	6	18.8	124	39.0	5.5	≥2	≥2
SMAP	Small acidic protein	9.39	1	5.2	42	20.0	4.8	1	1
SGTA	Small glutamine-rich tetratricopeptide repeat-containing protein alpha	2.87	1	2.9		34.0	5.0	1	1
SNRPE	Small nuclear ribonucleoprotein E	11.96	1	2.3		10.8	9.4	1	1
SNRPG	small nuclear ribonucleoprotein G	26.32	2	7.5		8.5	8.9	≥2	≥2
SNRPD2	Small nuclear ribonucleoprotein Sm D2	33.05	4	11.8		13.5	9.8	≥2	1
SNRPD3	Small nuclear ribonucleoprotein Sm D3	24.60	2	9.3	53	13.9	10.2	≥2	≥2
SUMO2	Small ubiquitin-related modifier 2	22.00	2	10.7	111	11.4	5.9	≥2	≥2

MTAP	S-methyl-5'-thioadenosine phosphorylase-like	9.54	2	7.7	65	31.0	7.1	1	≥2
CANT1	soluble calcium-activated nucleotidase 1	13.25	4	15.2	124	45.2	6.6	1	≥2
SORD	sorbitol dehydrogenase	2.24	1	2.8		38.3	7.7	1	1
SPARC	SPARC	60.91	15	123.1	329	34.9	4.8	≥2	≥2
SPTAN1	Spectrin alpha chain, brain	1.51	3	10.9	61	258.7	5.4	≥2	≥2
SMPD1	Sphingomyelin phosphodiesterase	10.62	4	12.4	85	66.2	7.0	≥2	≥2
DDX39B	Spliceosome RNA helicase BAT1	10.75	4	5.7	82	49.0	5.7	≥2	≥2
U2AF2	Splicing factor U2AF 65 kDa subunit	5.62	2	6.6	59	48.0	9.3	≥2	1
SFPQ	splicing factor, proline- and glutamine-rich	14.09	4	14.5	120	49.4	7.9	≥2	≥2
STC2	Stanniocalcin-2	8.96	2	8.1		23.5	7.9	≥2	≥2
STIP1	Stress-induced-phosphoprotein 1	13.44	6	25.1	157	62.6	6.8	≥2	≥2
Psap	Sulfated glycoprotein 1	73.62	32	389.5	1002	58.2	5.5	≥2	≥2
UBE2I	SUMO-conjugating enzyme UBC9	14.56	2	9.1		18.0	8.7	≥2	≥2
SBSN	Suprabasin	28.75	4	25.6	254	16.6	6.9	≥2	≥2
SDC4	Syndecan-4	31.19	5	26.3	240	22.2	4.6	≥2	≥2
SDCBP	Syntenin-1	11.41	2	8.0		32.2	6.9	≥2	≥2
CCT2	T-complex protein 1 subunit beta	13.27	6	23.3	206	57.5	6.5	≥2	≥2
CCT4	T-complex protein 1 subunit delta	17.63	7	25.5	227	58.1	8.0	≥2	≥2
CCT7	T-complex protein 1 subunit eta	11.42	5	14.7	187	54.9	7.4	≥2	≥2
CCT3	T-complex protein 1 subunit gamma	28.81	13	45.3	242	60.6	6.8	≥2	≥2
CCT6A	T-complex protein 1 subunit zeta	13.56	5	18.8	131	57.9	6.9	≥2	≥2
THOP1	Thimet oligopeptidase	9.03	3	11.1	180	53.6	6.1	≥2	≥2
TXN	Thioredoxin	45.71	4	32.2	195	11.7	4.9	≥2	≥2
TXNDC12	Thioredoxin domain-containing protein 12	8.82	1	5.0		19.0	5.8	1	1
TXNDC5	thioredoxin domain-containing protein 5	17.99	6	18.6	119	46.3	5.9	≥2	≥2
TXNL1	Thioredoxin-like protein 1	5.82	1	2.9		20.8	4.9	1	1
ALYREF	THO complex subunit 4	5.88	1	3.7	50	20.0	9.9	1	1
THBD	Thrombomodulin	4.27	1	4.1		35.4	4.7	1	1
THBS1	thrombospondin-1	34.10	32	168.8	767	129.6	4.9	≥2	≥2
THBS3	thrombospondin-3	9.00	7	25.7	159	104.1	4.6	≥2	≥2
TYMS	Thymidylate synthase	18.24	4	17.6	164	34.8	6.9	≥2	≥2
FUCA1	tissue alpha-L-fucosidase	18.18	6	22.6	161	53.3	6.5	≥2	≥2
PLAT	tissue-type plasminogen activator	2.50	1		44	63.0	8.2	1	1
TOR1B	Torsin-1B	17.09	2	9.9	55	18.3	6.9	≥2	≥2
TALDO1	transaldolase	19.88	7	24.2	182	37.5	7.0	≥2	≥2
TCEB2	Transcription elongation factor B polypeptide 2	6.78	1	2.3		13.1	5.0	1	1
TFAP4	Transcription factor AP-4	5.45	1	2.4		23.9	8.1	1	1
BTF3	Transcription factor BTF3	20.71	1	5.1	47	15.4	5.6	1	1
TRIM28	Transcription intermediary factor 1-beta	5.79	2	6.5		58.0	6.3	≥2	≥2

TAGLN2	Transgelin-2	56.28	9	44.1	481	22.4	8.6	≥2	≥2
VCP	Transitional endoplasmic reticulum ATPase	31.39	19	80.1	704	89.3	5.3	≥2	≥2
TKT	Transketolase	42.23	20	106.4	790	69.1	7.5	≥2	≥2
TPT1	Translationally-controlled tumor protein	45.93	4	14.2	97	19.5	4.9	≥2	≥2
TSN	Translin	3.54	1	2.5		25.9	8.0	1	1
GART	Trifunctional purine biosynthetic protein adenosine-3	2.48	2	4.6		107.5	6.8	≥2	≥2
TPI1	Triosephosphate isomerase	66.67	11	57.8	420	28.3	5.9	≥2	≥2
TPP1	Tripeptidyl-peptidase 1	47.42	16	79.6	779	61.5	6.5	≥2	≥2
TUBA1A	Tubulin alpha-1A chain	18.69	5	16.5		37.2	6.2	≥2	1
TBCB	Tubulin-folding cofactor B	8.81	2	4.6	53	21.7	4.9	≥2	≥2
TTLL12	tubulin--tyrosine ligase-like protein 12	1.25	1	2.4		74.1	5.6	1	1
TINAG	tubulointerstitial nephritis antigen	47.31	13	58.3	176	52.5	7.1	≥2	≥2
TNFRSF21	tumor necrosis factor receptor superfamily member 21	6.42	3	10.8		71.5	7.5	≥2	≥2
AXL	tyrosine-protein kinase receptor UFO	11.23	5	19.0	162	90.9	5.9	≥2	≥2
YARS	Tyrosyl-tRNA synthetase, cytoplasmic	3.79	2	7.4	88	59.2	7.0	≥2	≥2
SNRPA1	U2 small nuclear ribonucleoprotein A'	12.63	1	2.3		10.0	8.5	1	1
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	0.80	1	2.9	52	158.1	6.0	1	1
LSM2	U6 snRNA-associated Sm-like protein LSm2	11.70	1	3.0	40	10.7	6.5	1	1
UBE2L3	Ubiquitin-conjugating enzyme E2 L3	15.58	2	2.3	42	17.8	8.7	≥2	≥2
UBE2N	Ubiquitin-conjugating enzyme E2 N	47.37	6	19.7	73	17.1	6.6	≥2	1
UBA1	ubiquitin-like modifier-activating enzyme 1-like	14.18	12	46.9	351	117.6	5.7	≥2	≥2
B3GNT2	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 2	5.77	2	5.9	52	42.3	9.3	≥2	≥2
UXS1	UDP-glucuronic acid decarboxylase 1	27.45	2	7.1	54	17.1	9.1	≥2	≥2
UAP1L1	UDP-N-acetylhexosamine pyrophosphorylase-like protein 1	3.75	2	5.3		56.4	5.8	1	≥2
CMPK1	UMP-CMP kinase	9.25	2	5.7		25.6	7.9	≥2	≥2
D17Wsu104e	UPF0556 protein C19orf10 homolog	13.86	2	6.2	68	18.0	6.3	≥2	≥2
C11orf68	UPF0696 protein C11orf68 homolog	4.38	1	2.7		27.5	5.5	1	1
RAD23B	UV excision repair protein RAD23 homolog B	11.72	4	10.1	93	43.7	4.9	≥2	≥2
VPS35	vacuolar protein sorting-associated protein 35	0.84	1	2.3		96.0	5.5	1	1
VEGFA	Vascular endothelial growth factor A	23.94	3	17.7		24.6	8.1	≥2	≥2
VASN	Vasorin	24.95	6	28.8	148	50.9	7.1	≥2	≥2
VAPA	Vesicle-associated membrane protein-associated protein A	17.27	3	10.6	123	27.9	8.6	≥2	≥2
VAPB	Vesicle-associated membrane protein-associated protein B	4.94	1	4.1	82	26.8	7.8	1	1
HDLBP	Vigilin	2.21	2	7.2	94	141.7	6.8	≥2	≥2
VIM	Vimentin	52.15	28	131.2	1100	53.7	5.2	≥2	≥2
PROS1	vitamin K-dependent protein S	28.89	16	92.2	360	74.7	5.7	≥2	≥2
ATP6AP1	V-type proton ATPase subunit S1	19.27	6	28.1	298	48.9	6.0	≥2	≥2
WDR1	WD repeat-containing protein 1	18.29	8	18.8	146	66.4	6.9	≥2	≥2

Table 3.3.61: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to the NCBI database.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
EFTUD2	116 kDa U5 small nuclear ribonucleoprotein component-like	1.34	1	2.3		109.4	5.0
YWHAB	14-3-3 protein beta/alpha isoform 2	45.08	6	41.3	425	27.8	4.8
YWHAE	14-3-3 protein epsilon-like, partial	60.95	6	32.0	215	11.9	5.8
YWHAG	14-3-3 protein gamma	23.88	2	21.0	63	23.0	5.0
PSMC6	26S protease regulatory subunit 10B	2.83	1	2.8		44.1	7.5
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial, partial	3.24	1	2.6		42.3	8.0
RPS19	40S ribosomal protein S19-like, partial	23.53	4	10.2	71	15.1	10.5
FAU	40S ribosomal protein S30	16.95	1	2.4		6.6	12.1
RPS4X	40S ribosomal protein S4, X isoform-like	7.25	2	6.1	41	29.2	10.3
RPL11	60S ribosomal protein L11-like, partial	18.18	1	3.7	57	8.8	10.4
RPL15	60S ribosomal protein L15-like, partial	10.61	2	7.2	75	23.5	11.6
RPL31	60S ribosomal protein L31-like, partial	11.29	1	4.4	59	14.3	9.3
ADAMTS1	A disintegrin and metalloproteinase with thrombospondin motifs 1 isoform 1	16.44	10	43.2	274	104.8	7.8
ADAMTS7	A disintegrin and metalloproteinase with thrombospondin motifs 7-like	1.85	3	8.7	73	177.6	5.8
ACTA1	actin, alpha skeletal muscle	24.93	1	34.3	212	42.0	5.4
ACTB	actin, cytoplasmic 1	44.00	11	56.8	467	41.7	5.4
CAP1	adenylyl cyclase-associated protein 1-like isoform 1	18.99	7	25.9	75	51.5	7.3
ADM	ADM	26.63	3	11.3	97	20.6	10.2
ARF1	ADP-ribosylation factor 1-like, partial	23.08	1	4.1	89	7.3	5.3
AGRN	agrin-like isoform 1	10.56	15	64.3	179	217.0	5.8
AKR1A1	alcohol dehydrogenase	29.63	7	29.5	222	36.5	7.1
AKR1B10	Aldo-keto reductase family 1 member B10	5.78	2	7.7	94	31.5	9.1
ABP1	amiloride-sensitive amine oxidase	40.88	19	98.1	627	79.8	6.6
AIMP2	aminoacyl tRNA synthase complex-interacting multifunctional protein 2	7.81	1	5.0		35.4	7.8
AREG	Amphiregulin	3.48	1	2.6		25.3	8.2
ANG	angiogenin-like	6.90	1	3.1	42	16.5	9.3
ANXA2	annexin A2-like, partial	69.60	13	53.5	309	25.4	6.0
ARAP2	arf-GAP with Rho-GAP domain, ANK repeat and PH domain-containing protein 2, partial	0.47	1	2.2		169.7	7.3
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	1.21	1	2.3		72.1	6.1
AKNA	AT-hook-containing transcription factor	1.27	1	2.4		137.0	6.0
NPPA	Atrial natriuretic factor	13.26	5	28.3	119	40.3	7.5
LFNG	beta-1,3-N-acetylglucosaminyltransferase lunatic fringe-like	3.97	1	3.4	41	41.6	8.7
B2M	beta-2-microglobulin precursor	42.86	6	73.9	538	13.8	7.4
PNKP	bifunctional polynucleotide phosphatase/kinase	2.68	1	2.6		57.2	8.2

PRSS22	brain-specific serine protease 4-like	31.66	9	36.4	165	41.2	7.3
CHST11	carbohydrate sulfotransferase 11	6.82	1	3.9		41.6	8.9
CHST14	carbohydrate sulfotransferase 14-like	5.59	1	4.1	45	43.0	9.2
CBR1	Carbonyl reductase	26.56	6	20.6	93	26.7	7.8
CBR1	carbonyl reductase 1	35.02	4	25.9	122	30.5	7.7
CCL2	c-C motif chemokine 2-like	11.89	2	13.0	95	15.8	9.2
N/A	CCHC-type zinc finger	7.93	1	4.3		18.1	7.4
CD44	CD44 antigen isoform 5	5.85	2	6.1	65	39.4	5.9
CD81	CD81 antigen-like isoform 1	6.78	1	2.8		25.8	5.5
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide-alpha-2, 3-sialyltransferase	28.37	5	16.9	159	23.9	9.6
COL5A1	collagen alpha-1(V) chain-like, partial	8.19	5	23.5	42	103.3	5.9
CCBE1	Collagen and calcium-binding EGF domain-containing protein 1	4.29	1	2.6		32.5	6.7
C1QTNF1	complement C1q tumor necrosis factor-related protein 1-like	7.47	2	9.3	85	31.8	6.9
C1QTNF5	complement C1q tumor necrosis factor-related protein 5-like	15.23	3	15.5	149	25.3	6.4
CFH	complement factor H-like, partial	4.04	2	7.2	43	72.7	6.7
CXCL3	C-X-C motif chemokine 3 precursor	40.59	3	16.5	63	11.0	8.8
CRELD2	cysteine-rich with EGF-like domain protein 2 precursor	7.47	2	11.1	104	38.2	5.1
DPT	dermatopontin-like	9.45	2	5.8	48	24.0	4.9
SAT2	diamine acetyltransferase 2-like	4.14	1	2.2		19.4	7.4
DHFR	dihydrofolate reductase (EC 1.5.1.3)	39.57	8	30.1	196	21.6	8.0
ADAM22	disintegrin and metalloproteinase domain-containing protein 22, partial	4.48	3	16.4	98	106.2	7.5
DLG5	disks large homolog 5-like	2.56	1	2.3		27.8	6.9
DNAJB9	dnaJ homolog subfamily B member 9-like	7.21	1	4.8	42	25.6	8.3
DNAJB3	DnaJ-like subfamily C member 3	1.99	1	3.4	51	57.5	5.8
DYNLL1	dynein light chain 1, cytoplasmic-like, partial	18.03	1	3.0	50	7.2	9.1
RAD18	E3 ubiquitin-protein ligase RAD18	2.43	1	2.3		55.8	8.1
EEF1D	elongation factor 1-delta-like isoform 1	24.91	5	12.7	164	31.3	5.1
MAN1B1	endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase-like, partial	3.86	1		49	56.0	6.4
EIF4A2	eukaryotic initiation factor 4A-II-like isoform 3	4.17	1	4.7	83	36.2	7.4
GSPT2	Eukaryotic peptide chain release factor GTP-binding subunit ERF3B	1.71	1	3.5	45	65.3	6.3
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	1.20	2	4.9		174.8	5.4
SULF2	extracellular sulfatase Sulf-2	17.26	8	40.0	225	100.5	9.1
FDPS	Farnesyl pyrophosphate synthetase	9.07	3	8.9	62	43.2	7.8
FER1L6	Fer-1-like protein 6	2.65	1	2.6		36.3	5.2
FN1	fibronectin isoform 2	31.56	49	215.5	1233	262.9	5.9
FSIP2	Fibrous sheath-interacting protein 2	0.17	1	2.2		656.4	6.1
FLNB	filamin-B isoform 3	1.24	3	8.7		275.1	5.7
FKBP3	FK506-binding protein 3	7.77	1	2.6		10.6	6.8
FKBP4	FK506-binding protein 4	4.62	2	6.1	44	46.6	5.8

ALDOA	fructose-bisphosphate aldolase A isoform 1	45.60	12	40.6	410	39.4	8.1
FAH	fumarylacetoacetase-like, partial	14.13	4	12.4	98	40.1	6.7
GGH	Gamma-glutamyl hydrolase	18.08	3	17.5	253	30.9	7.5
PRKCSH	glucosidase 2 subunit beta-like isoform 2	10.67	4	17.6	107	59.1	4.5
GSTO1	Glutathione S-transferase omega-1	28.30	5	18.8	60	36.5	6.9
GSTO1	glutathione S-transferase omega-1-like isoform 1	46.67	9	32.6	122	27.4	8.0
GSTO1	glutathione S-transferase omega-1-like isoform 3	38.94	6	19.8	112	23.5	7.7
GSTP1	glutathione S-transferase P 1	53.81	11	49.2	403	23.6	7.8
Large	glycosyltransferase-like protein LARGE1	2.51	1	2.9		88.0	7.7
GLG1	Golgi apparatus protein 1 precursor	15.86	15	57.8	187	132.2	6.8
GOLM1	Golgi membrane protein 1	21.82	2	7.9	60	12.5	8.2
GRN	granulins isoform 2	24.66	8	33.0	85	63.9	6.4
GRN	granulins isoform 3	6.45	5	24.2	140	57.0	6.5
GNG2	guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2-like	10.00	1		41	7.6	7.9
H2-D1	h-2 class I histocompatibility antigen, D-B alpha chain-like, partial	6.67	1	3.2	54	21.4	9.2
H2-L	H-2 class I histocompatibility antigen, L-D alpha chain	22.03	2	7.6	145	25.6	6.0
Cd74	H-2 class II histocompatibility antigen gamma chain	6.38	2	5.3	47	36.3	8.7
HNRNPA1	heterogeneous nuclear ribonucleoprotein A1 isoform a	33.13	8	34.0	214	34.2	9.2
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	22.92	6	17.1	206	33.1	5.0
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 2	20.75	5	17.0	160	32.4	5.1
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	14.46	4	17.9	65	45.2	7.6
HNRNPK	heterogeneous nuclear ribonucleoprotein K-like isoform 4	25.74	9	40.9	210	48.5	5.9
SYNCRIP	heterogeneous nuclear ribonucleoprotein Q isoform 1	11.57	6	19.8	197	62.6	7.6
HIST1H2AG	Histone H2A type 1	20.54	7	21.7	120	34.2	11.1
HIST1H2AG	Histone H2B type 1	26.98	3	10.4	143	13.9	10.3
HIST1H3A	Histone H3	31.09	3	29.3	107	29.6	11.1
HIST3H3	Histone H3.1t	9.69	1	6.4	167	35.8	10.7
RBBP4	Histone-binding protein RBBP4	7.17	2	4.8		25.3	6.3
HAPLN4	hyaluronan and proteoglycan link protein 4-like	23.06	9	35.8	258	46.2	8.0
N/A	hypothetical protein I79_015376	2.85	2	9.3	79	231.1	5.6
N/A	hypothetical protein I79_016815	8.00	1		54	12.8	11.1
N/A	hypothetical protein I79_017197	15.79	1	2.4		8.4	7.1
N/A	hypothetical protein I79_018775	8.62	1		41	13.1	9.5
N/A	hypothetical protein I79_021924	9.35	1	3.2	40	13.2	4.4
N/A	hypothetical protein LOC100755523	12.50	1	5.6		7.9	7.7
N/A	hypothetical protein LOC100760484	7.00	4	10.2	51	58.0	9.3
N/A	hypothetical protein LOC100766349	21.10	3	17.0	112	25.5	9.9
N/A	hypothetical protein LOC100767830, partial	10.45	2	6.2	97	19.7	8.7
INHBB	inhibin beta B chain-like	5.35	1	3.8		35.9	7.2

IMPA1	Inositol monophosphatase	4.66	1	3.4	42	25.6	6.8
IFNAR2	Interferon-alpha/beta receptor beta chain	13.83	3	11.3	101	28.7	5.6
IL1R1	Interleukin-1 receptor-like 1	46.83	14	135.3	379	37.6	9.0
IDH1	isocitrate dehydrogenase	37.68	13	47.6	493	46.7	7.0
KRT10	Keratin, type I cytoskeletal 10	16.05	4	12.4	105	27.8	4.5
KRT16	keratin, type I cytoskeletal 16-like	3.83	2	5.3	68	51.3	5.2
KRT26	keratin, type I cytoskeletal 26-like, partial	5.20	1		42	18.5	7.0
KRT77	Keratin, type II cytoskeletal 1b	8.86	5	32.7	258	93.4	5.5
KRT2	Keratin, type II cytoskeletal 2 epidermal	7.94	2	10.8	119	45.9	8.1
KRT5	keratin, type II cytoskeletal 5-like	8.40	4	23.0	101	54.4	5.4
KRT71	Keratin, type II cytoskeletal 71	5.24	5	23.6	134	133.3	6.6
KRT8	keratin, type II cytoskeletal 8-like	4.10	1	6.2	72	54.3	5.8
MFGE8	lactadherin-like, partial	67.24	11	55.6	358	19.9	8.6
LMNA	Lamin-A/C	26.47	13	44.1	317	64.0	8.0
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	9.09	2	5.6	60	34.9	5.9
LAMA5	laminin subunit alpha-5 isoform 1	36.04	93	576.3	3500	405.6	6.9
N/A	Lamin-L(I)	2.28	1	3.1	53	54.9	4.9
LTBP3	latent-transforming growth factor beta-binding protein 3-like	0.81	1	3.2		146.0	6.4
LDLR	low-density lipoprotein receptor precursor	7.38	5	19.1	176	94.5	4.9
LRP8	Low-density lipoprotein receptor-related protein 8	4.84	2	7.3		84.4	5.4
SSB	Lupus La protein-like	14.00	5	16.3	144	46.8	9.7
LIPA	lysosomal acid lipase/cholesteryl ester hydrolase-like	14.36	5	18.3	156	45.6	7.7
CTSA	Lysosomal protective protein	45.68	14	68.3	279	54.2	6.1
PRCP	lysosomal Pro-X carboxypeptidase-like	12.40	5	18.0	148	55.4	6.7
LOXL4	Lysyl oxidase-like 4	7.53	4	16.9	110	84.7	8.0
KARS	lysyl-tRNA synthetase-like isoform 1	3.18	2	6.2		67.9	6.2
CSF1	macrophage colony-stimulating factor 1 isoform 1	10.87	4	13.7		60.7	5.5
CSF1	macrophage colony-stimulating factor 1 isoform 2	12.06	3	10.6		29.5	7.4
EPDR1	Mammalian ependymin-related protein 1	12.03	3	9.2	128	27.5	6.7
GMPPB	mannose-1-phosphate guanyltransferase beta	6.39	2	8.9	45	39.8	6.5
MAN1A1	mannosyl-oligosaccharide 1,2-alpha-mannosidase IA-like, partial	10.97	5	15.0	174	71.5	6.7
MRGPRG	mas-related G-protein coupled receptor member G-like	5.52	1	3.2		32.3	8.6
Rpl18	mCG132477, isoform CRA_c	16.91	2	5.6	55	15.2	11.8
N/A	MGC84994 protein	23.68	2	7.5		9.0	6.0
MAP4	microtubule-associated protein 4	2.79	2	8.1	118	116.8	5.0
MAP6	microtubule-associated protein 6-like, partial	7.56	1	2.3		50.2	9.2
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase-like isoform 1	41.33	9	55.4	157	37.2	7.5
Nlrp9a	NACHT, LRR and PYD domains-containing protein 9A	2.29	1	2.7		59.4	6.1
NPPB	natriuretic peptides B-like	38.02	5	43.3	267	13.4	10.1

NTN4	Netrin-4	6.27	3	8.7	90	64.0	8.1
NBL1	neuroblastoma suppressor of tumorigenicity 1-like	3.93	1	2.0		19.1	5.0
GANAB	neutral alpha-glucosidase AB isoform 2	8.47	6	21.6	101	106.9	6.0
NCEH1	neutral cholesterol ester hydrolase 1-like	1.94	1	3.1	50	68.3	7.8
NBR1	Next to BRCA1 gene 1 protein	1.50	1	2.5		95.7	5.6
Nid1	nidogen-1-like, partial	57.78	24	198.5	1308	54.6	6.4
NSFL1C	NSFL1 cofactor p47-like isoform 2	37.30	11	41.0	236	40.7	5.1
GTPBP4	nucleolar GTP-binding protein 1	2.05	1	2.7		74.0	9.5
NME1	nucleoside diphosphate kinase A-like isoform 1	63.82	6	40.8	273	17.2	6.3
OLA1	obg-like ATPase 1 isoform 1	7.07	2	8.7	139	44.7	7.8
PTHLH	Parathyroid hormone-related protein	5.24	1	2.4		22.0	10.6
PAM	Peptidyl-glycine alpha-amidating monooxygenase B	19.62	11	35.6	364	94.7	6.5
PPIA	Peptidyl-prolyl cis-trans isomerase	67.68	9	35.8	235	17.9	8.3
PPID	peptidyl-prolyl cis-trans isomerase D-like, partial	3.37	1	2.6	50	29.4	6.4
FKBP3	peptidyl-prolyl cis-trans isomerase FKBP3-like, partial	11.70	2	8.7	66	21.1	9.3
PLIN4	perilipin-4-like	11.52	2	7.9	46	184.1	8.4
PRDX6	peroxiredoxin-6-like, partial	14.61	3	11.0		24.5	6.8
PIP5K1A	phosphatidylinositol-4-phosphate 5-kinase-like protein 1-like	3.54	1	2.3		45.8	9.8
PHYHIP	phytanoyl-CoA hydroxylase-interacting protein-like	2.73	1	2.4		37.4	7.1
PAFAH1B2	platelet-activating factor acetylhydrolase IB subunit beta-like, partial	6.77	1	2.9	63	14.5	6.4
PLEKHG3	pleckstrin homology domain-containing family G member 3 isoform 3	1.45	2	3.0	68	129.5	6.3
PLEC	plectin	1.56	5	18.0	132	533.6	5.9
PCBP2	poly(rC)-binding protein 2 isoform 4	13.66	3	11.4	69	33.9	8.2
PTBP1	polypyrimidine tract-binding protein 1-like, partial	9.35	2	6.0	72	23.0	9.0
PTBP2	Polypyrimidine tract-binding protein 2	3.77	1	3.3	59	23.2	8.8
N/A	polyubiquitin	52.49	4	12.0	108	42.9	7.6
KCNH4	potassium voltage-gated channel subfamily H member 4-like	1.51	1	2.6		115.7	8.8
TSR2	Pre-rRNA-processing protein TSR2-like	13.45	1	4.9	66	13.2	4.4
DDX5	probable ATP-dependent RNA helicase DDX5	3.74	2	6.4	63	69.2	8.9
DDX6	probable ATP-dependent RNA helicase DDX6 isoform 1	4.97	1	6.0	51	54.3	8.7
CTSH	pro-cathepsin H-like	16.82	5	12.5	121	37.4	8.5
PLOD1	procollagen-lysine,2-oxoglutarate 5-dioxygenase 1-like, partial	37.52	20	86.0	801	81.5	6.6
PROSC	Proline synthetase co-transcribed bacterial-like protein	7.62	1	3.2		24.8	6.4
PSME2	proteasome activator complex subunit 2-like isoform 2	24.78	4	17.7	154	26.2	5.2
PSMA6	proteasome subunit alpha type-6-like, partial	19.55	3	7.5	90	24.4	6.6
PSMA7	proteasome subunit alpha type-7-like isoform 3	15.57	2	6.8		23.9	9.0
PRMT1	protein arginine N-methyltransferase 1 isoform 1	10.20	3	10.4	69	40.5	5.6
CNPY2	Protein canopy-like 2	16.49	1	3.3	52	11.0	4.8
CREG1	protein CREG1-like	9.55	1	3.8		24.1	8.0

Ctla2b	protein CTLA-2-beta-like	44.00	3	13.2	161	11.8	5.1
FNTB	protein farnesyltransferase subunit beta-like, partial	3.44	1	2.3		55.2	6.1
HEG1	protein HEG homolog 1-like	0.94	1	2.8		113.7	6.2
POMGNT1	protein O-linked-mannose beta-1,2-N-acetylglucosaminyltransferase 1-like isoform 2	2.08	1	3.4		71.6	6.6
TANC2	Protein TANC2	0.41	1		50	217.5	7.6
D1Pas1	putative ATP-dependent RNA helicase PI10-like	2.29	1	3.6	47	58.1	7.1
SLC38A10	putative sodium-coupled neutral amino acid transporter 10 isoform 1	1.01	1	2.7		117.8	5.5
PKM	pyruvate kinase isozymes M1/M2-like isoform 1	58.19	23	152.0	954	57.9	7.3
N/A	pyruvate kinase isozymes M1/M2-like isoform 2	20.79	8	31.2	254	49.8	6.6
G3BP2	ras GTPase-activating protein-binding protein 2 isoform 1	10.24	3	16.7	136	50.7	5.3
YPT1	Ras-like GTP-binding protein YPT1	22.92	2	6.6	80	10.9	5.1
RAC3	ras-related C3 botulinum toxin substrate 3	6.76	1	3.6		16.7	8.6
RAB11A	ras-related protein Rab-11A isoform 1	9.26	2	5.0		24.4	6.6
RAB39A	Ras-related protein Rab-39A	12.64	1	3.2	48	10.2	9.5
RAB7A	ras-related protein Rab-7a-like	14.98	3	7.8	53	23.5	6.7
RAP1B	ras-related protein Rap-1b isoform 1 precursor	5.98	1	2.9		20.8	5.8
RPA3	replication protein A 14 kDa subunit-like	29.75	2	7.6		13.6	4.8
RPA1	replication protein A 70 kDa DNA-binding subunit, partial	8.43	3	9.7	41	55.5	8.0
RHOC	rho-related GTP-binding protein RhoC precursor	6.22	1	3.5		22.0	6.6
RPS28	ribosomal protein S28	31.82	2	6.8	53	7.4	9.7
FBLL1	rRNA/tRNA 2'-O-methyltransferase fibrillarin-like protein 1	14.29	1	3.9		10.8	6.8
STK38	Serine/threonine-protein kinase 38	7.69	1	2.2		15.0	5.4
PKN1	serine/threonine-protein kinase N1	1.02	1	5.4		109.0	6.6
PPP1CA	serine/threonine-protein phosphatase PP1-alpha catalytic subunit isoform 1	13.33	4	12.0	67	37.5	6.3
SERPINB6	serpin B6 isoform 1	12.96	4	15.6	118	43.1	5.9
SH2D3C	SH2 domain-containing protein 3C	1.10	1	2.4		90.7	8.5
SIAE	sialate O-acetylesterase-like	24.00	10	38.6	151	61.4	8.2
SSB	Sjogren syndrome antigen B	11.29	3	10.1	98	36.0	9.3
SLITRK4	SLIT and NTRK-like protein 4	1.21	1	2.6		92.7	7.9
SPIN4	spindlin-4-like	4.02	1	2.5		28.5	8.1
DDX39B	spliceosome RNA helicase Ddx39b-like, partial	10.24	2	5.4	44	22.8	5.6
SF3A1	splicing factor 3A subunit 1 isoform 1	3.03	2	6.4	53	88.7	5.2
SFPQ	splicing factor proline/glutamine rich (polypyrimidine tract binding protein associated)	13.68	3	12.2	101	40.2	6.7
SRSF1	splicing factor, arginine/serine-rich 1, transcript variant 2	9.45	2	5.4	42	22.3	7.9
CTTN	src substrate cortactin-like isoform 1	7.29	2	6.6	87	49.0	5.1
CXCL12	Stromal cell-derived factor 1	17.98	2	8.1	66	10.0	9.5
QSOX1	sulfhydryl oxidase 1	25.22	13	60.2	402	78.0	8.4
SULT1C2	sulfotransferase 1C2-like	4.01	1	2.2		35.3	8.3
SOD1	superoxide dismutase	19.01	3	17.5	175	25.9	9.6

VAT1	Synaptic vesicle membrane protein VAT-1-like	26.25	6	19.8	135	28.5	7.6
TCP1	T-complex protein 1 subunit alpha	17.81	8	33.2	245	60.3	6.0
CCT5	T-complex protein 1 subunit epsilon-like isoform 1	15.53	7	20.5	187	59.5	5.5
CCT8	T-complex protein 1 subunit theta	35.12	6	18.7	148	22.2	4.9
Testin-2	testin-2-like	7.81	2	3.7	78	38.2	7.8
TES	testin-like isoform 1	2.96	1		51	46.1	7.5
TXNRD1	thioredoxin reductase 1	44.89	16	70.6	363	54.7	6.8
THUMPD1	THUMP domain-containing protein 1-like	3.90	1	2.6		40.3	6.5
TFPI	tissue factor pathway inhibitor-like	38.80	9	55.9	41	34.4	8.2
TANK	TRAF family member-associated NF-kappa-B activator	4.45	1	15.6	97	48.7	5.3
PURB	Transcriptional activator protein Pur-beta	10.47	1	2.5		9.6	5.0
TGFBR3	transforming growth factor beta receptor type 3	2.75	2	4.5		92.1	5.9
TGFB1	transforming growth factor beta-1-like, partial	7.35	1	5.3	45	31.2	8.2
TGFB2	Transforming growth factor beta-2	1.55	1	2.3		44.6	8.6
TRAIP	TRIP protein	1.69	1	2.9	50	77.1	4.8
TPM1	tropomyosin alpha-1 chain-like	30.28	7	56.6	213	32.8	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 2	30.36	6	36.6	245	28.8	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 3	41.94	9	41.3	298	28.9	4.8
TPM3	tropomyosin alpha-3 chain-like isoform 7	38.31	8	36.8	282	29.0	4.8
TPM2	Tropomyosin beta chain	21.89	5	33.4	195	30.7	4.8
TPM2	tropomyosin beta chain-like, partial	7.36	1	6.5	47	29.9	4.6
TSC22D1	TSC22 domain family protein 1	9.02	1	3.8	56	14.4	4.8
TUBA1C	tubulin alpha-1C chain	35.19	10	43.2	353	49.9	5.1
TUBA4A	tubulin alpha-4A chain	6.24	1	7.5	84	48.3	5.0
TUBB2A	Tubulin beta-2 chain	17.63	3	20.5	161	46.5	5.0
TUBB2B	tubulin beta-2B chain-like	28.89	4	51.9	374	49.6	4.9
TUBB3	Tubulin beta-3 chain	12.40	2	38.8	285	85.4	6.0
TUBB4B	tubulin beta-4B chain	26.01	8	33.3	186	41.8	4.9
TNFSF9	tumor necrosis factor ligand superfamily member 9-like	16.94	4	11.6	81	33.6	6.2
TNFRSF12A	tumor necrosis factor receptor superfamily member 12A-like isoform 1	22.58	1	6.1		13.0	7.6
TNFAIP6	tumor necrosis factor-inducible gene 6 protein-like	12.00	3	8.9	77	31.0	7.6
N/A	ubc2e ubiquitin conjugating enzyme, isoform CRA_b	10.00	1	2.9		12.6	8.3
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	2.75	2	6.3	66	93.3	5.1
UBAP2	ubiquitin-associated protein 2 isoform 2	2.75	2	6.6		103.7	7.0
UBE2V2	ubiquitin-conjugating enzyme E2 variant 2-like, partial	20.00	3	11.9	70	15.4	4.9
UGDH	UDP-glucose 6-dehydrogenase-like, partial	43.70	8	36.4	272	29.4	7.6
C22orf28	UPF0027 protein C22orf28-like	5.00	2	5.3		47.8	7.1
C14orf166	UPF0568 protein C14orf166-like	8.18	1	2.7	41	12.3	6.9
VEGFC	Vascular endothelial growth factor C	6.65	2	7.3	54	39.3	8.3

SEC22B	vesicle-trafficking protein SEC22b precursor	10.23	2	7.6	82	24.7	8.5
VCL	vinculin isoform 1	4.41	4	12.9	101	116.6	6.0
ZNF829	zinc finger protein 829-like	1.48	1	3.6	77	70.3	8.5

Table 3.3.62: HCPs from the cell culture supernatant of an IgG secreting DP12 cell line identified with one or more peptides as being unique to the CHO BB database.

Gene Symbol	Protein Name	Σ Coverage	Σ# Unique Peptides	Sequest Score	Ion Score	MW [kDa]	calc. pI
YWHAB	14-3-3 protein beta/alpha	44.72	6	41.3	456	28.1	4.8
YWHAE	14-3-3 protein epsilon	56.08	14	91.3	720	29.1	4.7
ACAA2	3-ketoacyl-CoA thiolase, mitochondrial	3.27	1	2.7		41.9	8.3
RPS14	40S ribosomal protein S14	29.41	3	10.7	78	16.5	9.9
RPS17	40S ribosomal protein S17	38.69	4	19.8	138	15.7	9.9
RPS5	40S ribosomal protein S5	11.63	2	8.1	46	24.1	9.7
RPS7	40S ribosomal protein S7	10.31	2	5.2	41	22.1	10.1
RPL15	60S ribosomal protein L15	10.29	2	7.2	75	24.1	11.6
RPL15	60S ribosomal protein L15-B	4.46	1	2.2		24.0	11.2
RPL22	60S ribosomal protein L22	39.06	3	18.1	157	14.8	9.3
RPL28	60S ribosomal protein L28	8.03	1	2.6		15.7	12.0
RPL38	60S ribosomal protein L38	18.06	1	4.3	43	8.4	10.1
RPL4	60S ribosomal protein L4	9.47	1	2.2		10.2	10.9
HSPA5	78 kDa glucose-regulated protein	48.78	27	216.6	1998	72.3	5.2
ACTG1	Actin, cytoplasmic 2	69.95	18	115.8	797	41.8	5.5
ACTR3	Actin-related protein 3	5.50	2	7.3	58	47.3	5.9
CAP1	Adenylyl cyclase-associated protein 1	18.99	7	25.9	78	51.5	7.3
Arf2	ADP-ribosylation factor 2	14.36	2	7.0	83	20.7	6.0
AGRN	Agrin	39.42	3		158	11.6	5.9
AKR1A1	Alcohol dehydrogenase (NADP+)	29.72	7	29.5	232	36.3	7.1
Akr1b7	Aldose reductase-related protein 1	7.26	1	3.0	46	14.1	8.7
Akr1b8	Aldose reductase-related protein 2	62.97	13	64.6	295	36.3	6.7
NAPA	Alpha-soluble NSF attachment protein	3.39	1	2.6		33.2	5.5
ANXA2	Annexin A2	56.93	15	62.1	369	38.6	8.0
RNPEPL1	Arginyl aminopeptidase-like 1	1.42	1		40	55.6	4.9
ACLY	ATP-citrate synthase	1.54	1	3.2	41	98.9	7.2
DDX3X	ATP-dependent RNA helicase DDX3X	2.11	1	3.6	47	63.2	6.8
B4GALT5	Beta-1,4-galactosyltransferase 5	5.26	1		42	18.0	6.9
B2M	Beta-2-microglobulin	42.86	6	71.7	579	13.8	7.4
BLOC1S2	Biogenesis of lysosome-related organelles complex-1 subunit 2	9.68	1	2.5		14.2	4.9
CALM1	Calmodulin; Short	38.00	5	18.3	256	16.9	4.2
CBR1	Carbonyl reductase [NADPH] 1	31.05	7	22.9	131	30.5	7.7
CTSH	Cathepsin H	15.43	5	13.7	95	37.7	8.5
CTSZ	Cathepsin Z	61.11	12	77.5	207	34.0	7.6

CD44	CD44 antigen	9.29	2	6.0	103	25.1	5.7
CD81	CD81 antigen	6.78	1	5.2		25.7	5.5
CDC42	Cell division control protein 42 homolog	5.24	1	3.0		21.3	6.0
CNBP	Cellular nucleic acid-binding protein	7.65	1	4.0		18.7	7.7
ST3GAL1	CMP-N-acetylneuraminate-beta-galactosamide- alpha-2,3-sialyltransferase 1	13.25	2	7.0	42	18.7	7.0
CFL2	Cofilin-2	22.29	1	21.8	152	18.8	8.0
CXCL3	C-X-C motif chemokine 3	40.59	3	19.3	63	11.1	8.8
CRELD2	Cysteine-rich with EGF-like domain protein 2	5.30	1	4.8		33.1	4.4
DHFR	Dihydrofolate reductase	39.57	8	41.3	306	21.6	8.0
ADAM19	Disintegrin and metalloproteinase domain-containing protein 19	38.06	4	17.2	47	17.2	6.8
ADAM22	Disintegrin and metalloproteinase domain-containing protein 22	8.85	3	16.4	103	54.2	6.9
DNAJC3	DnaJ homolog subfamily C member 3	2.03	1	2.8		56.4	5.8
DYNLL2	Dynein light chain 2, cytoplasmic	12.36	1	2.8		10.3	7.4
RANBP2	E3 SUMO-protein ligase RanBP2	0.84	1		43	94.2	7.0
EEF1D	Elongation factor 1-delta	25.95	5	14.9	205	32.2	5.2
MAN1B1	Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase	3.23	1		49	66.7	8.1
ERH	Enhancer of rudimentary homolog	17.31	2	7.5		12.2	5.5
GSPT1	Eukaryotic peptide chain release factor GTP-binding subunit ERF3A	1.86	1	3.5	45	59.7	5.6
EIF1AX	Eukaryotic translation initiation factor 1A, X-chromosomal	13.89	2	5.3		16.4	5.2
EIF4E	Eukaryotic translation initiation factor 4E	3.23	1	2.7		25.1	6.2
EIF5A2	Eukaryotic translation initiation factor 5A-2	16.67	1	2.9	57	7.8	8.5
CAPZA2	F-actin-capping protein subunit alpha-2	9.09	2	6.0	59	33.0	5.8
FDPS	Farnesyl pyrophosphate synthase	9.37	3	8.6		41.6	5.5
FN1	Fibronectin	30.51	48	211.3	1319	262.6	6.0
FLNB	Filamin-B	0.78	1	3.1		149.2	5.9
ALDOA	Fructose-bisphosphate aldolase A	39.08	11	35.4	342	40.0	8.1
FAH	Fumarylacetoacetase	12.17	4	12.4	100	46.2	7.6
LGALS1	Galectin-1	43.70	5	19.7	203	14.8	6.2
PRKCSH	Glucosidase 2 subunit beta	10.67	4	18.2	118	59.1	4.5
GSTP1	Glutathione S-transferase P	53.81	11	96.9	865	23.6	7.8
GLG1	Golgi apparatus protein 1	9.67	8	27.4	68	111.1	8.2
GOLGB1	Golgin subfamily B member 1	2.82	1	2.5		49.1	4.9
GRAMD3	GRAM domain-containing protein 3	2.07	1	4.6		48.0	8.2
CXCL1	Growth-regulated alpha protein	66.20	2	19.1		7.8	8.8
H2-Q10	H-2 class I histocompatibility antigen, Q10 alpha chain	49.33	2	6.9	116	8.5	5.3
HSP90AA1	Heat shock protein HSP 90-alpha	14.05	11	40.8	280	84.7	5.0
HNRNPCL1	Heterogeneous nuclear ribonucleoprotein C	19.37	5	17.0	167	34.6	5.1
HNRNPH2	Heterogeneous nuclear ribonucleoprotein H2	9.58	2	12.2	77	49.2	6.3
HNRNPK	Heterogeneous nuclear ribonucleoprotein K	23.79	9	32.8	214	52.3	5.5

SYNCRIP	Heterogeneous nuclear ribonucleoprotein Q	12.67	6	19.8	212	57.3	8.7
HIST1H2AJ	Histone H2A type 1-J	37.14	1	7.5		7.8	10.1
H2AFZ	Histone H2A.Z	12.50	1	12.3	72	13.5	10.6
HIST1H2BH	Histone H2B type 1-H	28.81	4	22.3	174	13.1	10.1
H3F3A	Histone H3.3	35.29	3	10.0	48	15.3	11.3
N/A	Idua-006	4.29	3	8.5	137	68.7	7.4
IMPA1	Inositol monophosphatase 1	3.97	1	3.4	42	30.4	5.5
IDH1	Isocitrate dehydrogenase [NADP] cytoplasmic	37.68	13	47.6	525	46.7	7.0
TMPO	Lamina-associated polypeptide 2, isoform beta	7.46	2	5.6	60	43.3	9.5
LMNB1	Lamin-B1	2.30	1	3.4	55	54.4	5.1
LAMA5	Laminin subunit alpha-5	40.37	16	79.8	531	71.2	8.3
LDLR	Low-density lipoprotein receptor	10.99	5	19.1	186	64.0	5.4
SSB	Lupus La protein homolog	9.09	3	11.2	126	47.7	9.4
LOXL4	Lysyl oxidase homolog 4	5.99	1	2.9		19.3	6.8
KARS	Lysyl-tRNA synthetase	3.28	2	6.2		66.0	6.2
CSF1	Macrophage colony-stimulating factor 1	10.87	4	13.7		60.7	5.5
MAP6	Microtubule-associated protein 6	8.82	1	2.8	49	10.8	8.6
AGA	N(4)-(beta-N-acetylglucosaminyl)-L-asparaginase	41.33	9	55.4	162	37.2	7.5
AHNAK	Neuroblast differentiation-associated protein AHNAK	19.61	4	17.4	116	33.1	6.0
GANAB	Neutral alpha-glucosidase AB	8.28	6	21.6	107	109.4	6.1
NSFL1C	NSFL1 cofactor p47	37.10	11	41.0	258	41.0	5.2
NME1	Nucleoside diphosphate kinase A	62.99	6	40.8	299	17.4	7.4
SPG7	Paraplegin	2.46	1	2.3		27.0	7.1
PAM	Peptidyl-glycine alpha-amidating monooxygenase	20.14	11	35.6	386	92.4	6.5
PPID	Peptidyl-prolyl cis-trans isomerase D	2.43	1	5.0	44	40.8	7.2
FKBP4	Peptidyl-prolyl cis-trans isomerase FKBP4	4.15	2	6.1	44	51.5	5.5
PRDX2	Peroxiredoxin-2	39.90	6	12.9	97	21.8	5.6
PRDX6	Peroxiredoxin-6	14.29	3	11.0		25.0	6.8
PAFAH1B2	Platelet-activating factor acetylhydrolase IB subunit beta	4.19	1	2.9	63	24.2	6.0
PLEKHG3	Pleckstrin homology domain-containing family G member 3	2.66	1	5.5		43.6	7.8
PCBP1	Poly(rC)-binding protein 1	13.96	3	9.3	44	32.4	6.5
PTBP1	Polypyrimidine tract-binding protein 1	3.77	2	6.0	75	57.0	9.2
UBB	Polyubiquitin-B	56.36	4	12.0	117	12.4	8.4
LMNA	Prelamin-A/C	20.06	11	40.1	317	69.0	6.9
DDX17	Probable ATP-dependent RNA helicase DDX17	11.27	2	6.4	63	23.6	6.0
DDX23	Probable ATP-dependent RNA helicase DDX23	1.37	1	2.4		93.3	9.5
DDX6	Probable ATP-dependent RNA helicase DDX6	18.75	1	6.1	41	14.0	8.7
PCNA	Proliferating cell nuclear antigen	26.05	6	23.5	233	28.8	4.7
PROSC	Proline synthase co-transcribed bacterial homolog protein	5.82	1	4.0		30.5	8.3

PSMA6	Proteasome subunit alpha type-6	14.23	3	6.5	119	27.4	7.2
PRMT1	Protein arginine N-methyltransferase 1	9.70	3	10.4	73	42.4	5.4
CNPY2	Protein canopy homolog 2	8.84	1		52	20.6	5.1
CWC15	Protein CWC15 homolog	3.49	1	2.5		26.6	5.6
SEC31A	Protein transport protein Sec31A	0.63	1	2.5		122.2	8.6
PKM	Pyruvate kinase isozymes M1/M2	61.96	25	144.5	998	57.9	7.3
G3BP2	Ras GTPase-activating protein-binding protein 2	10.18	3	16.7	146	51.1	5.3
RAC1	Ras-related C3 botulinum toxin substrate 1	13.74	2	3.3	42	20.4	8.4
RAB11A	Ras-related protein Rab-11A	9.26	2	5.0		24.4	6.6
RAB1B	Ras-related protein Rab-1B	15.71	2	6.6	83	15.9	5.6
RAP1B	Ras-related protein Rap-1b	5.98	1	2.8		20.8	5.8
RPIA	Ribose-5-phosphate isomerase	4.40	1	2.5		29.5	7.0
FBL	rRNA 2'-O-methyltransferase fibrillarin	5.05	1		46	29.7	9.7
SRSF1	Serine/arginine-rich splicing factor 1	20.14	3	8.0	42	16.4	11.4
PPP1CC	Serine/threonine-protein phosphatase PP1-gamma catalytic subunit	10.59	3	8.4	46	36.7	6.3
SERPINB6	Serpin B6	12.34	4	9.3	137	43.4	5.9
Sprr2h	Small proline-rich protein 2H	67.02	2	8.1		10.1	7.2
SF3A1	Splicing factor 3A subunit 1	2.75	1	2.6	48	43.4	8.2
SF3B3	Splicing factor 3B subunit 3	1.97	2	6.9	76	135.4	5.3
CTTN	Src substrate cortactin	10.19	2	6.6	87	34.9	7.0
SOD1	Superoxide dismutase (Cu-Zn)	32.47	3	15.4	151	15.8	6.6
VAT1	Synaptic vesicle membrane protein VAT-1 homolog	27.48	6	24.4	156	28.8	8.0
CCT5	T-complex protein 1 subunit epsilon	15.53	7	20.5	193	59.5	5.6
TES	Testin	2.90	1		48	47.2	7.6
TXNRD1	Thioredoxin reductase 1, cytoplasmic	42.50	16	70.6	382	57.8	7.5
TARS	Threonyl-tRNA synthetase, cytoplasmic	3.76	1		49	21.4	8.6
TGFB1	Transforming growth factor beta-1	25.78	6	23.5	133	33.2	8.6
RHOA	Transforming protein RhoA	18.65	3	18.6		21.8	6.1
TPM3	Tropomyosin alpha-3 chain	40.63	5	17.3	131	15.2	4.7
TPM4	Tropomyosin alpha-4 chain	32.23	9	56.1	334	27.8	4.6
TUBA8	Tubulin alpha-8 chain	31.41	3	12.4	209	17.7	6.7
TUBB4B	Tubulin beta-2C chain	42.56	3	58.6	467	48.8	5.1
N/A	Tubulin beta-7 chain	33.71	12	44.2	239	50.1	4.9
TFIP11	Tuftelin-interacting protein 11	9.84	1	2.7		13.9	7.5
TNFRSF12A	Tumor necrosis factor receptor superfamily member 12A	21.71	1	6.1		13.5	7.6
USP5	Ubiquitin carboxyl-terminal hydrolase 5	2.75	2	6.3	66	93.3	5.1
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	10.13	1	3.8		18.1	5.1
UBAP2L	Ubiquitin-associated protein 2-like	2.69	2	6.6		106.1	7.0
UBE2D2	Ubiquitin-conjugating enzyme E2 D2	7.48	1	2.5		16.7	7.8

UBE2K	Ubiquitin-conjugating enzyme E2 K	10.50	2	5.4	53	22.4	5.4
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	24.16	4	10.2	51	16.6	8.8
UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	19.86	3	11.9	73	16.5	8.6
FAU	Ubiquitin-like protein FUBI	7.52	1	2.7		14.3	10.3
UGDH	UDP-glucose 6-dehydrogenase	31.44	12	41.2	437	54.9	7.6
C22orf28	UPF0027 protein C22orf28 homolog	4.36	2	5.3		55.2	7.2
C14orf166	UPF0568 protein C14orf166 homolog	4.66	1	2.7	41	22.4	7.0
UGP2	UTP--glucose-1-phosphate uridylyltransferase	4.13	2	5.1	57	56.9	7.6
VPS37A	Vacuolar protein sorting-associated protein 37A	5.04	1	2.4		44.4	5.7
SEC22B	Vesicle-trafficking protein SEC22b	10.23	2	7.6	85	24.7	8.5
VIPAS39	VPS33B-interacting protein	2.24	1	2.2		56.7	7.4

Appendix D

Table 4.3.1: Table indicating the total number of phosphopeptides identified using each phosphopeptide enrichment method following enrichment of CHO SEAP cells grown under temperature shifted and non-temperature shifted conditions.

Enrichment Method	Total number of phosphopeptides identified
Iron Oxide	960
Titanium Dioxide	867
Gallium Oxide	105

Table 4.3.2: List of phosphopeptides identified as unique to Titanium dioxide phosphopeptide enrichment of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
TNKS1BP1	182 kDa tankyrase-1-binding protein	D**S**LGSFSTR	1.000	1	2	2.2	BB/NCBI
ABI1	Abl interactor 1	TNPPTQKPP**S**PPVSGR	1.000	1	2	2.4	BB/NCBI
ANLN	Actin-binding protein anillin	LLTSIT**S**K	0.994	1	2	2.4	BB/NCBI
ANLN	Actin-binding protein anillin	SREPLSEASNQQPL**S**GGEEK	1.000	1	3	4.7	BB/NCBI
ARPC1B	Actin-related protein 2/3 complex subunit 1B	KA**S**SEGGASTGAGLDSLHK	0.992	1	3	3.8	BB/NCBI
AKAP12	A-kinase anchor protein 12	NAE**S**PTSPVSGETTSSFK	1.000	1	2	4.2	BB/NCBI
AARSD1	Alanyl-tRNA editing protein Aarsd1	GAQADHFTQTPL**S**PGSQVQVR	1.000	1	3	4.8	BB/NCBI
ANAPC1	Anaphase-promoting complex subunit 1	SP**S**ISNmAALSR	1.000	1	2	3.2	BB/NCBI
ANK3	Ankyrin-3	RQ**S**FASLALR	1.000	1	2	2.5	BB/NCBI
GIT1	ARF GTPase-activating protein GIT1	HG**S**GADSDYENTQSGDPPLGLEGK	1.000	1	3	5.8	BB/NCBI
RERE	Arginine-glutamic acid dipeptide repeats protein	KQPA**S**PDGRA**S**PINEDIR	1.000	2	3	4.0	BB/NCBI
DDX24	ATP-dependent RNA helicase DDX24	VGAAAHLG**S**PPR	1.000	1	2	2.4	BB/NCBI
BAG3	BAG family molecular chaperone regulator 3	AAP**S**PPPAEAAAPKPEAEAPAK	1.000	1	2	2.8	BB/NCBI
BAG3	BAG family molecular chaperone regulator 3	GKK**S**PENEDPQTESQQPEAK	1.000	1	3	3.9	BB/NCBI
BCLAF1	Bcl-2-associated transcription factor 1	NTPSQHSHSIQH**S**PER	1.000	1	2	2.8	BB/NCBI
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SV**S**VATGLNmmK	1.000	1	2	3.2	BB/NCBI
FAM175B	BRISC complex subunit Abro1	FSG**S**GADLLPSQR	1.000	1	2	2.5	BB/NCBI
BAZ2A	Bromodomain adjacent to zinc finger domain protein 2A	RPSGDSEEmPQ**S**PTGLGQPK	1.000	1	3	4.1	BB/NCBI
BRD2	Bromodomain-containing protein 2	KADTTTPTPTAmLAPG**S**PA**S**PPGSLEPK	0.993	2	3	5.0	BB/NCBI
CAMK2D	Calcium/calmodulin-dependent protein kinase type II subunit delta	NF**S**AAK**S**LLK	1.000	2	2	2.6	BB/NCBI
CARHSP1	Calcium-regulated heat stable protein 1	DR**S**P**S**PLRGNVVP**S**PLPTR	1.000	3	3	3.9	BB/NCBI
CEBPZ	CCAAT/enhancer-binding protein zeta	SQLDDHPE**S**DEENFVDVRDD**S**DIEK	1.000	2	3	5.1	BB/NCBI
CD2AP	CD2-associated protein	**S**VDFDALLVR	1.000	1	2	2.8	BB/NCBI
CDC42EP1	Cdc42 effector protein 1	SD**S**LLSFR	1.000	1	2	2.6	BB/NCBI
CDC42EP1	Cdc42 effector protein 1	TA**S**PPAPSPAPPAISPIIK	0.994	1	2	3.5	BB/NCBI
CHMP2B	Charged multivesicular body protein 2b	ATI**S**DEEIER	1.000	1	2	2.4	BB/NCBI
CLCC1	Chloride channel CLIC-like protein 1	EIGELPGESTPTEHSSSATAVSGQAAGTAEG**S**PIK	1.000	1	3	5.6	BB/NCBI
CBX5	Chromobox protein homolog 5	TADSSS**S**EDEEEYVVEK	0.992	1	2	4.7	BB/NCBI

COPA	Coatomer subunit alpha	NL**S**PGAVESDVR	1.000	1	2	4.1	BB/NCBI
CCDC86	Coiled-coil domain-containing protein 86	ALLEFESNPEETSEPK**S**PR	0.998	1	2	2.5	BB/NCBI
NCAPD2	Condensin complex subunit 1	RQPLTSID**S**DNDFVTPKPR	0.996	2	3	4.1	BB/NCBI
CDK13	Cyclin-dependent kinase 13	HS**S**I**S**PSTLTLK	0.996	2	2	2.9	BB/NCBI
CDK16	Cyclin-dependent kinase 16	RL**S**LPADIR	1.000	1	2	2.2	BB/NCBI
GAK	Cyclin-G-associated kinase	DGSEV**S**DEEEPPFPSEAR	1.000	1	2	3.0	BB/NCBI
DENND4C	DENN domain-containing protein 4C	RS**S**LPLEHGPPAQDSPDIEK	0.999	1	3	5.3	BB/NCBI
DFFA	DNA fragmentation factor subunit alpha	KNPLPGEQQ**S**PKR	1.000	1	2	2.8	BB/NCBI
MSH6	DNA mismatch repair protein Msh6	SEKDNP**S**E**S**EEELQPK	1.000	2	2	3.8	BB/NCBI
XPC	DNA repair protein complementing XP-C cells homolog	SEAVAPHANAGGGL**SS**DEEEGTSSQAEAAR	1.000	2	3	4.8	BB/NCBI
TOP2B	DNA topoisomerase 2-beta	VVETVN**S**D**S**DSEFGIPK	0.998	2	2	5.4	BB/NCBI
DBN1	Drebrin	LS**S**PVLHR	1.000	1	2	2.3	BB/NCBI
DYRK1A	Dual specificity tyrosine-phosphorylation-regulated kinase 1A	IYQ**Y**IQSR	1.000	1	2	2.6	BB/NCBI
PIAS1	E3 SUMO-protein ligase PIAS1	GILSLPHQA**S**PVSR	0.998	1	2	2.9	BB/NCBI
EEF1D	Elongation factor 1-delta	AA**T**PAEDDEDDDIDLFG**S**DEEEEDKEAAR	1.000	2	3	6.5	BB/NCBI
EIF3B	Eukaryotic translation initiation factor 3 subunit B	EHSVAGAEEEGG**S**DG**S**SPEAEPR	1.000	2	3	4.5	BB/NCBI
SLC1A3	Excitatory amino acid transporter 1	DVEmGN**S**VIEENEmK	1.000	1	2	4.5	BB/NCBI
FOXJ3	Forkhead box protein J3	VTLYNTDQDGSD**S**PR	1.000	1	2	4.0	BB/NCBI
FNBP1L	Formin-binding protein 1-like	TI**S**DGTISASK	1.000	1	2	2.4	BB/NCBI
GPATCH8	G patch domain-containing protein 8	GPKPEPPGSG**S**PAPPR	1.000	1	2	3.1	BB/NCBI
GPI	Glucose-6-phosphate isomerase	SN**S**PIVVDSR	1.000	1	2	2.3	BB/NCBI
GOLIM4	Golgi integral membrane protein 4	AE**S**HEPGHQEADTEAEADR	1.000	1	3	4.2	BB/NCBI
GOLGA4	Golgin subfamily A member 4	VP**S**VESLFR	1.000	1	2	2.6	BB/NCBI
HSPA4	Heat shock 70 kDa protein 4	mQVDQEEPHAEEQQPQ**T**PAENKVESEEmETSQAGSK	1.000	1	4	4.4	BB/NCBI
SKIV2L	Helicase SKI2W	AS**S**LEDLVLK	1.000	1	2	2.6	BB/NCBI
HDGF	Hepatoma-derived growth factor	AGDmLED**S**PKRPK	1.000	1	2	2.5	BB/NCBI
HDGFRP2	Hepatoma-derived growth factor-related protein 2	VmTVTAVTTTAT**S**DR	0.998	1	2	3.6	BB/NCBI
HNRNPUL2	Heterogeneous nuclear ribonucleoprotein U-like protein 2	**S**GDETPGSEAPGDKATEEQGDDQDSEK	0.996	1	3	4.8	BB/NCBI
HMGA1	High mobility group protein HMG-I/HMG-Y	KQPPKEPSEVP**T**PK	1.000	1	2	2.6	BB/NCBI
Htatsf1	HIV Tat-specific factor 1 homolog	VFDDE**S**DENEDEEEAEEK	1.000	1	2	5.9	BB/NCBI
HMGCS1	Hydroxymethylglutaryl-CoA synthase, cytoplasmic	RPSTNDHNLGDGVGLVHSNTATEHIP**S**PAK	1.000	1	4	5.1	BB/NCBI
IRF2BP2	Interferon regulatory factor 2-binding protein 2	KP**S**PEPEGEVGPPK	1.000	1	2	3.3	BB/NCBI
KIF23	Kinesin-like protein KIF23	YmLTHQELA**S**DGEIQTK	1.000	1	3	4.7	BB/NCBI

LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	RG**S**GDTSISmDTEASIR	1.000	1	2	2.4	BB/NCBI
LMO7	LIM domain only protein 7	SA**S**VNKEPIcLPGImR	0.995	1	3	5.2	BB/NCBI
LMO7	LIM domain only protein 7	**S**mSDVSAEDIQNLR	0.994	1	2	4.4	BB/NCBI
PPFIBP1	Liprin-beta-1	GSQGTSPFQmSPP**S**PDSK	0.999	1	2	3.4	BB/NCBI
KDM2A	Lysine-specific demethylase 2A	GDEEGLGGEEEEEEEEEDD**S**AEEGGAAR	1.000	1	3	4.4	BB/NCBI
MED24	Mediator of RNA polymerase II transcription subunit 24	LLSTNEDDANILS**S**PTDR	0.995	1	2	4.6	BB/NCBI
PGRMC1	Membrane-associated progesterone receptor component 1	LLKEGEEPTVY**S**DDEDPKDENAR	1.000	1	3	4.5	BB/NCBI
MTA1	Metastasis-associated protein MTA1	NNm**S**PHGIPAR	1.000	1	2	2.4	BB/NCBI
MTA1	Metastasis-associated protein MTA1	SAPVINNG**S**PTILGK	1.000	1	2	2.8	BB/NCBI
DGCR8	Microprocessor complex subunit DGCR8	YGVD**S**DHP**S**DGETSVQPmmTK	1.000	2	3	5.0	BB/NCBI
ABCC4	Multidrug resistance-associated protein 4	TENEEAEHP**S**ASGTPTLR	0.999	1	2	2.6	BB/NCBI
MYBBP1A	Myb-binding protein 1A	DVPSDSQ**S**PISQK	0.998	1	2	2.5	BB/NCBI
MYBBP1A	Myb-binding protein 1A	K**S**PQSALPR	1.000	1	2	2.5	BB/NCBI
BIN1	Myc box-dependent-interacting protein 1	SP**S**PPPDGSPAATPEIR	0.999	1	2	2.6	BB/NCBI
MLF2	Myeloid leukemia factor 2	LAIQGPED**S**PSR	0.999	1	2	2.3	BB/NCBI
MPRIP	Myosin phosphatase Rho-interacting protein	SK**S**NPDFLKK	0.999	1	2	2.5	BB/NCBI
MYH10	Myosin-10	GGPISFSS**S**R	0.998	1	2	2.3	BB/NCBI
MYO9B	Myosin-IXb	RK**S**DPGAEPGHFGVcVDSLTSDK	1.000	1	4	4.5	BB/NCBI
MYO18A	Myosin-XVIIIa	FSHSYL**S**D**S**DTEAKPTETNA	0.990	2	2	4.8	BB/NCBI
MTMR9	Myotubularin-related protein 9	QLAELETEDGLRE**S**P	1.000	1	2	3.2	BB/NCBI
SLC1A4	Neutral amino acid transporter A	SEEETSPLVTHQNPSG**S**LVTAPELESK	1.000	1	3	5.8	BB/NCBI
HMGN1	Non-histone chromosomal protein HMG-14	QAEAADQQTTDLPAENGETENQ**S**PA**S**EVEEK	1.000	2	3	4.9	BB/NCBI
NSFL1C	NSFL1 cofactor p47	RH**S**GQDVHVVLK	1.000	1	2	2.4	BB/NCBI
NSFL1C	NSFL1 cofactor p47	**S**PNELVDDLFK	1.000	1	2	3.2	BB/NCBI
NCOR2	Nuclear receptor corepressor 2	**S**PGNTSQPPAFFSK	0.996	1	2	3.1	BB/NCBI
ZC3HC1	Nuclear-interacting partner of ALK	SmGTGDSAGLEVPS**S**PLRK	1.000	1	3	4.0	BB/NCBI
NOL11	Nucleolar protein 11	KK**S**ETNLQAEVPGSK	1.000	1	2	3.4	BB/NCBI
NOP58	Nucleolar protein 58	HIKEEPL**S**DEEPcTSTAIPSPEK	1.000	1	3	3.8	BB/NCBI
OSBPL2	Oxysterol-binding protein-related protein 2	mDD**S**PEKANSDVPGDmTDDVPVAQETVQVIPGSK	1.000	1	3	4.5	BB/NCBI
PHF3	PHD finger protein 3	mAPPVDDL**S**PK	1.000	1	2	2.3	BB/NCBI
PI4KB	Phosphatidylinositol 4-kinase beta	TA**S**NPKVENEDEPVR	0.999	1	2	2.3	BB/NCBI
PHKB	Phosphorylase b kinase regulatory subunit beta	QS**S**TVDAPELR	0.994	1	2	2.9	BB/NCBI
PINX1	PIN2/TERF1-interacting telomerase inhibitor 1	EAAVTDVEN**S**PQHK	0.997	1	2	2.4	BB/NCBI
PHLDB1	Pleckstrin homology-like domain family B	**S**P**S**PTLGESLAPR	1.000	2	2	3.1	BB/NCBI

	member 1						
PLEC	Plectin	QI**T**VEELVR	1.000	1	2	2.4	BB/NCBI
PABPN1	Polyadenylate-binding protein 2	QmNm**S**PPPGNAGPVImSLEEK	1.000	1	3	5.3	BB/NCBI
PMF1	Polyamine-modulated factor 1	GPEGS**S**PESVPVDTTVSR	0.995	1	2	2.8	BB/NCBI
LMNA	Prelamin-A/C	**S**VGGSGGGSFGDSLVTR	1.000	1	2	3.7	BB/NCBI
FIP1L1	Pre-mRNA 3'-end-processing factor FIP1	AEFT**S**PPSLFK	0.990	1	2	3.0	BB/NCBI
PRPF38A	Pre-mRNA-splicing factor 38A	VSALEEDmDDVE**SS**EEEEEEDEKLER	1.000	2	3	4.8	BB/NCBI
ZDHHC5	Probable palmitoyltransferase ZDHHC5	SIGSASPGPGQPPLS**S**PTR	0.996	1	2	2.5	BB/NCBI
CBY1	Protein chibby homolog 1	SA**S**LSNLHSLDR	0.998	1	2	2.3	BB/NCBI
FAM172A	Protein FAM172A	KQL**S**ADGTDEPAEK	1.000	1	2	2.9	BB/NCBI
ZMYND8	Protein kinase C-binding protein 1	LNFDmTA**S**PK	0.998	1	2	2.3	BB/NCBI
FAM129A	Protein Niban	RV**S**AILPGAPDNEVFQEPEEK	1.000	1	3	4.5	BB/NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	DKK**S**PLIESTANmENNQPQK	1.000	1	3	4.6	BB/NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	KTG**S**YGALAEITASK	0.994	1	2	3.4	BB/NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	RS**T**QGVTLTDLQEAEK	0.999	1	2	4.1	BB/NCBI
SCRIB	Protein scribble homolog	mQ**S**PELPAPER	1.000	1	2	2.9	BB/NCBI
N/A	Putative rRNA methyltransferase 3	ALDISL**SS**EEERDEDESIAETK	1.000	2	3	4.5	BB/NCBI
N/A	Putative rRNA methyltransferase 3	QED**S**EEEEEEQLNQTLAEmK	1.000	1	3	4.4	BB/NCBI
RAB3GAP1	Rab3 GTPase-activating protein catalytic subunit	AG**S**QLGLDHLR	1.000	1	2	2.3	BB/NCBI
RANBP3L	Ran-binding protein 3	VL**S**PPKLNEASSDASR	1.000	1	2	2.8	BB/NCBI
RCOR1	REST corepressor 1	EREE**S**EDELEETNGSNPIDIEIDPNK	1.000	1	3	6.2	BB/NCBI
RBL1	Retinoblastoma-like protein 1	EAVT**T**PVASATQSVSR	0.998	1	2	2.8	BB/NCBI
RBL1	Retinoblastoma-like protein 1	VIAISGDAE**S**PAKR	1.000	1	2	3.6	BB/NCBI
RAVER1	Ribonucleoprotein PTB-binding 1	HKm**S**PPPSSFNEPR	1.000	1	2	3.2	BB/NCBI
RRP1B	Ribosomal RNA processing protein 1 homolog B	SILV**S**PTGLSR	0.999	1	2	2.6	BB/NCBI
RPAP3	RNA polymerase II-associated protein 3	HNVIKPVDNPPHRG**S**PK	1.000	1	3	3.8	BB/NCBI
RBM14	RNA-binding protein 14	LSE**S**QLSFR	1.000	1	2	3.7	BB/NCBI
RRP12	RRP12-like protein	GDSIEEILAD**S**EDEDEEEER	1.000	1	2	4.5	BB/NCBI
SLTM	SAFB-like transcription modulator	DGQDAIAQ**S**PEKETK	1.000	1	2	2.6	BB/NCBI
SCYL2	SCY1-like protein 2	RA**S**LTLEEK	0.998	1	2	2.6	BB/NCBI
SEC23IP	SEC23-interacting protein	KL**S**LGAYVSSAR	1.000	1	2	2.5	BB/NCBI
SENP3	Sentrin-specific protease 3	**S**PPVPSGPPmEEDGLR	1.000	1	2	2.2	BB/NCBI
SEPT2	Septin-2	IYHLPDAE**S**DEDEDFKEQTR	1.000	1	3	3.9	BB/NCBI
SERINC1	Serine incorporator 1	SDG**S**LEDGDDVHR	1.000	1	2	2.9	BB/NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	KVEL**S**E**S**EEDKGSK	1.000	2	2	2.4	BB/NCBI

SRRM1	Serine/arginine repetitive matrix protein 1	**S**PELPEPSVR	1.000	1	2	3.1	BB/NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SL**S**Y**S**PVER	1.000	2	2	2.6	BB/NCBI
SRSF11	Serine/arginine-rich splicing factor 11	DYDEEEQGYD**S**EKEK	1.000	1	2	2.4	BB/NCBI
STK3	Serine/threonine-protein kinase 3	ELEEEEEN**S**DEDELDSHTmVK	1.000	1	3	3.8	BB/NCBI
PAK2	Serine/threonine-protein kinase PAK 2	**S**VIDPIPAPAGDSNVDGGAK	1.000	1	2	2.3	BB/NCBI
PRPF4B	Serine/threonine-protein kinase PRP4 homolog	EIIDA**S**DKEGL**S**PAKR	1.000	2	2	2.2	BB/NCBI
SIK3	Serine/threonine-protein kinase SIK3	RA**S**DGGANIQLHAQQLLK	1.000	1	3	4.0	BB/NCBI
SRPK1	Serine/threonine-protein kinase SRPK1	RPNKQEE**S**E**S**PVETPLTENPPNK	1.000	2	3	4.4	BB/NCBI
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	RK**S**ELPQDPHTEK	1.000	1	3	3.8	BB/NCBI
PPP4R2	Serine/threonine-protein phosphatase 4 regulatory subunit 2	ESDDALAVNEEPSEEGTHmEDSDG**S**PAQR	0.994	1	3	5.3	BB/NCBI
SH3KBP1	SH3 domain-containing kinase-binding protein 1	**S**IEVENDFLPVEK	1.000	1	2	4.7	BB/NCBI
SPPL2B	Signal peptide peptidase-like 2B	RD**S**DAPISQHPPGEEPAK	1.000	1	3	3.9	BB/NCBI
SF1	Splicing factor 1	**S**P**S**PEPIYNSEGK	1.000	2	2	3.1	BB/NCBI
RBM17	Splicing factor 45	RPDPD**S**DEDEDYER	1.000	1	2	3.8	BB/NCBI
SURF2	Surfeit locus protein 2	DmDKSENDTPQDFL**T**DQEEEKPK	1.000	1	3	5.4	BB/NCBI
SMARCC1	SWI/SNF complex subunit SMARCC1	**S**PQVPAAQQmLNFPEK	1.000	1	2	2.4	BB/NCBI
TLN1	Talin-1	SKDHFGLEGDEESTmLEDSV**S**PK	0.999	1	3	5.3	BB/NCBI
TBC1D25	TBC1 domain family member 25	QA**S**LDGLQQLR	1.000	1	2	2.2	BB/NCBI
TNS3	Tensin-3	RE**S**LPSAER	1.000	1	2	2.2	BB/NCBI
THOC5	THO complex subunit 5 homolog	ALFKPPEDSQDDE**S**D**S**DAEEEQTTK	0.997	2	3	4.2	BB/NCBI
THRAP3	Thyroid hormone receptor-associated protein 3	FSGEEGEIEDDE**S**GTENREEK	0.999	1	3	4.5	BB/NCBI
THRAP3	Thyroid hormone receptor-associated protein 3	IDI**S**PSTFR	1.000	1	2	2.9	BB/NCBI
THRAP3	Thyroid hormone receptor-associated protein 3	SPVGK**S**PPATGSAYGSSQK	0.999	1	3	4.1	BB/NCBI
TRAPPC10	Trafficking protein particle complex subunit 10	RQE**S**GSSLETPSGLALEDGAHVLR	1.000	1	3	5.3	BB/NCBI
TCEA1	Transcription elongation factor A protein 1	KKEPTISSQN**S**PEAR	1.000	1	3	4.4	BB/NCBI
SUPT6H	Transcription elongation factor SPT6	Km**S**DDEDDDEEEYGKEEHEK	1.000	1	3	5.3	BB/NCBI
PUS1	tRNA pseudouridine synthase A, mitochondrial	VK**S**LEDEEAPR	1.000	1	2	3.2	BB/NCBI
PRPF3	U4/U6 small nuclear ribonucleoprotein Prp3	WDEQTSNTKGDDDEE**S**DEEAVKK	1.000	1	3	5.5	BB/NCBI
USP36	Ubiquitin carboxyl-terminal hydrolase 36	GASSGL**S**PEHPASR	1.000	1	2	2.2	BB/NCBI
USP36	Ubiquitin carboxyl-terminal hydrolase 36	KPAPPQSLTTPPTTSQG**S**PGTSESR	1.000	1	3	5.4	BB/NCBI
UBAP2L	Ubiquitin-associated protein 2-like	RYPSSISS**S**PQK	0.997	1	2	2.5	BB/NCBI
C12orf45	Uncharacterized protein C12orf45 homolog	GKIEVLD**S**PASK	1.000	1	2	2.7	BB/NCBI

N/A	Uncharacterized protein KIAA1143 homolog	IQPQLPDDDGDH**S**DKEDEQPQVVVLK	1.000	1	3	4.7	BB/NCBI
KIAA1522	Uncharacterized protein KIAA1522	LQLERPV**S**PEAQADLQR	1.000	1	3	3.9	BB/NCBI
VAPB	Vesicle-associated membrane protein-associated protein B	**S**LTSSLDDAEVKK	0.999	1	2	2.5	BB/NCBI
ATP6V0A2	V-type proton ATPase 116 kDa subunit a isoform 2	KD**S**EEEVSLLGSQDIEEGSNR	1.000	1	3	4.8	BB/NCBI
YTHDC1	YTH domain-containing protein 1	GI**S**PIVFDR	1.000	1	2	3.1	BB/NCBI
ZC3H11A	Zinc finger CCCH domain-containing protein 11A	KVEAPETNIDK**T**PK	1.000	1	3	3.9	BB/NCBI
ZC3H18	Zinc finger CCCH domain-containing protein 18	ETGSEQDLDGAGERA**S**DLEDEENATR	1.000	1	3	4.4	BB/NCBI
ZC3H18	Zinc finger CCCH domain-containing protein 18	SPEDEEQPAL**S**DDDILR	1.000	1	2	3.2	BB/NCBI
ZNF438	Zinc finger protein 828	KS**S**PASLDFSESQK	1.000	1	2	3.6	BB/NCBI
ZYX	Zyxin	**S**PGGPGPLTLK	1.000	1	2	2.4	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	EEGVSQQGSGAPLAPE**S**PGGPISGVR	1.000	1	3	4.5	NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	NSGSF**S**PGLETEDPLEAR	1.000	1	2	4.4	NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	**S**PPSGSQSLLEGImTASSSK	0.999	1	2	4.9	NCBI
N/A	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3-like isoform 5	RN**S**VTPLASPEPTK	0.998	1	2	2.6	NCBI
AKAP1	A kinase anchor protein 1, mitochondrial	SE**S**SGNLPSNVDTR	0.999	1	2	4.2	NCBI
AKAP12	A-kinase anchor protein 12-like	AA**S**PEcEEAHPQPVQTVDASISER	1.000	1	3	4.3	NCBI
AKAP13	A-kinase anchor protein 13	FLSH**S**TDSLNK	0.996	1	2	2.5	NCBI
MKI67	Antigen KI-67	ERPQ**S**PGKLESPGVTPPTANDER	0.999	1	3	4.0	NCBI
TP53BP2	apoptosis-stimulating of p53 protein 2	KNQ**S**SEDILR	0.993	1	2	2.7	NCBI
BCLAF1	bcl-2-associated transcription factor 1	FND**S**QGDDTEETEDYR	1.000	1	2	5.2	NCBI
ARFGEF1	brefeldin A-inhibited guanine nucleotide-exchange protein 2-like	ELEKPIQSKPQSPVIQATAG**S**PK	0.998	2	3	4.5	NCBI
BRD1	Bromodomain-containing protein 1	VHGEPA**S**DL**S**DID	1.000	2	2	3.3	NCBI
CAMSAP2	calmodulin-regulated spectrin-associated protein 2 isoform 1	SV**S**NEGLTLNNSR	1.000	1	2	3.5	NCBI
CAST	Calpastatin	SKD**T**SPAPVAEAVPR	0.997	1	2	3.1	NCBI
CLIP1	CAP-Gly domain-containing linker protein 1	AA**S**PLSTAGATTASSSSATPSNIPHKPSQSTAK	1.000	1	3	3.9	NCBI
CDK4	Cell division protein kinase 4	ALQHSYLHKEE**S**DPE	1.000	1	2	2.8	NCBI
CENPC	centromere protein C 1	LVLPSN**S**PNVR	0.996	1	2	2.2	NCBI
PCYT1A	Choline-phosphate cytidylyltransferase A	AVTcDI**S**EDEED	1.000	1	2	2.2	NCBI
COPB1	Coatomer subunit beta'	TTVHQEPDGKPAS**S**PVILASQPIQK	0.997	1	3	4.6	NCBI
CCDC12	coiled-coil domain-containing protein 12-like	LKGQEDNLASAVDATTGQEAcD**S**D	1.000	1	2	6.2	NCBI
CCDC25	Coiled-coil domain-containing protein 25	VENmSSNQDGND**S**DEFm	1.000	1	2	3.9	NCBI
COBLL1	Cordon-bleu protein-like 1	ST**S**VDDNDKSSTDGVmVR	0.994	1	3	4.2	NCBI

CRTC2	CREB-regulated transcription coactivator 2	HG**S**GPNIILTGDSSPGFSK	1.000	1	3	4.0	NCBI
ERCC6	DNA excision repair protein ERCC-6	AESALNLSLDSSNK**S**DEEPEVISVK	0.998	1	3	5.2	NCBI
POLA2	DNA polymerase alpha subunit B-like	**S**PHQLLSPSSFSPSAAPSQK	0.999	1	3	4.1	NCBI
HUWE1	E3 ubiquitin-protein ligase HUWE1	**S**HHAASTTTAPTPAAR	1.000	1	2	3.3	NCBI
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	SF**S**KEVEER	1.000	1	2	2.2	NCBI
FARP1	FERM, RhoGEF and pleckstrin domain-containing protein 1-like	LGAPENSGIS**T**LER	1.000	1	2	3.0	NCBI
FKBP15	FK506-binding protein 15	RL**S**LTLDPEK	0.999	1	2	2.2	NCBI
GEMIN5	gem-associated protein 5	AmADGPNRDDPSQETEQLPSQPQ**S**PR	1.000	1	3	4.2	NCBI
USO1	General vesicular transport factor p115	NLGHPVEEEDE**S**GDQEDDDDEmDDGDKDQDI	1.000	1	3	8.5	NCBI
HSP90AB1	heat shock protein HSP 90-beta-like	EKEI**S**DDEAEEEK	1.000	1	2	3.1	NCBI
HNRNPL	heterogeneous nuclear ribonucleoprotein L	TEEGEIVY**S**AEESESR	0.992	1	2	4.2	NCBI
HMGN5	high mobility group nucleosome-binding domain-containing protein 5-like	QDGEKEE**S**LSGV	0.994	1	2	2.3	NCBI
HIRIP3	HIRA-interacting protein 3-like	LTGGLGD**S**EEEKER	1.000	1	2	3.3	NCBI
N/A	hypothetical protein LOC100756984, partial	DHLDTPEDEL**S**DEPR	1.000	1	2	3.4	NCBI
N/A	hypothetical protein LOC100773692	VKPL**S**PGAQPK	1.000	1	2	2.3	NCBI
IRS2	insulin receptor substrate 2, partial	TY**S**LTTPAR	0.993	1	2	2.3	NCBI
IFIH1	interferon-induced helicase C domain-containing protein 1 isoform 1	LAVLED**S**DE**S**EDDASGHAEELKDNVK	1.000	2	3	4.5	NCBI
IQSEC1	IQ motif and SEC7 domain-containing protein 1	mQF**S**FEGPEK	1.000	1	2	2.8	NCBI
KANK1	KN motif and ankyrin repeat domain-containing protein 1-like	SY**S**AGNASQLELLSR	1.000	1	2	4.4	NCBI
BAG6	Large proline-rich protein BAT3	LQEDPNY**S**PQR	0.994	1	2	3.0	NCBI
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	SEQQAEALD**S**PQKK	1.000	1	2	2.7	NCBI
LRRC47	Leucine-rich repeat-containing protein 47	RE**S**GEGEDEVADSAR	1.000	1	2	3.5	NCBI
MDC1	Mediator of DNA damage checkpoint protein 1	ASDDVDQGVDmG**S**PGGQLEGNQASSATVEDSSAQAG K	1.000	1	3	5.0	NCBI
MDC1	Mediator of DNA damage checkpoint protein 1	VLLAED**S**EEEVDFPSGR	1.000	1	2	5.0	NCBI
MNS1	Meiosis-specific nuclear structural protein 1	**S**LHVQVLNK	1.000	1	2	2.5	NCBI
MAP4	microtubule-associated protein 4	AADQQFNLPIDEG**S**LENLEQK	1.000	1	3	4.2	NCBI
ZAK	Mitogen-activated protein kinase kinase kinase MLT	SS**S**PTQYGLTK	0.998	1	2	2.2	NCBI
ABCC1	multidrug resistance-associated protein 1	GS**S**KLDVNEEVEALIVK	0.996	1	2	5.3	NCBI
MUM1L1	Mutated melanoma-associated antigen 1-like protein 1	STQSQENmPNEEDTTVASESVPQQQDD**S**PPPKK	1.000	1	3	4.1	NCBI
MYH9	Myosin-9	KG**T**GDc**S**DEEVDGKADGAEAKPAE	1.000	2	3	5.9	NCBI

NLRX1	NLR family member X1	IKPSS**S**ANAIYSLAAR	0.998	1	2	3.3	NCBI
NSRP1	nuclear speckle splicing regulatory protein 1-like	VLQKPSVFGND**S**DDDDETSVSESLQR	1.000	1	3	4.2	NCBI
NVL	nuclear valosin-containing protein isoform 2	ESLPLDL**S**DDQSNYK	1.000	1	2	2.7	NCBI
NOL8	Nucleolar protein 8	FLE**S**D**S**EEEEKELNENKTNEDELAAEK	0.999	2	3	4.0	NCBI
NOL8	Nucleolar protein 8	SSm**S**DDDID**S**EDELK	0.997	2	2	5.0	NCBI
TPR	Nucleoprotein TPR	EVVQTPLNV**S**VSEEGK	0.997	1	2	3.2	NCBI
OSTF1	osteoclast-stimulating factor 1-like	TLSNAEDYIDEED**S**D	1.000	1	2	2.3	NCBI
OSBPL11	oxysterol-binding protein-related protein 11	RP**S**QNAISFFNVGHSK	1.000	1	3	4.1	NCBI
OSBPL11	oxysterol-binding protein-related protein 11	SF**S**LASSGNSPISQR	1.000	1	2	4.4	NCBI
OSBPL3	Oxysterol-binding protein-related protein 3	ALVHQL**S**NESR	0.992	1	2	2.2	NCBI
BRPF1	Peregrin	RLPAL**S**H**S**EGEEEEDEEEDEGK	1.000	2	3	6.3	NCBI
GIGYF2	PERQ amino acid-rich with GYF domain-containing protein 2 isoform 1	AGTEANEEAPQISLSSARPG**T**PSDPQPQEAPQLER	0.990	1	3	6.2	NCBI
PPP1R18	Phostensin	KEETLSPGIALDQ**S**PVTK	1.000	1	3	4.2	NCBI
IWS1	Protein IWS1-like	TAA**S**D**S**EEEVGKEELSVK	0.995	2	2	2.3	NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	SG**S**YSYLEER	0.991	1	2	2.4	NCBI
PRRC2B	protein PRRC2B-like	LKF**S**DDEEEEEAVK	1.000	1	2	3.1	NCBI
PDCD11	protein RRP5 homolog	RD**S**ETADDKEEEEENSDLTVR	0.990	1	3	5.4	NCBI
SAMD4B	Protein Smaug-like 2	AAFTTPDHAPL**S**PQSSVASSGSEQTEEQGSSR	0.992	1	3	7.5	NCBI
SEC31A	Protein transport protein Sec31A	VDGSDVALKDPDQVAQ**S**DGEESPAAEEQLLGER	1.000	2	3	8.3	NCBI
WIZ	Protein Wiz	KAPLTLAG**S**PTPK	0.991	1	2	2.9	NCBI
WIZ	Protein Wiz	SPQLSLSPRPT**S**PK	0.998	2	2	2.9	NCBI
RIN2	Ras and Rab interactor 2	NS**S**FVLPK	1.000	1	2	2.4	NCBI
ARHGAP29	rho GTPase-activating protein 29	**S**LDSESISPGDFHR	0.997	1	2	2.8	NCBI
ARHGEF2	Rho guanine nucleotide exchange factor 2	ILSQ**S**TDSLNmR	0.998	1	2	3.6	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	mScFSRP**S**m**S**PTPLDR	1.000	2	3	3.8	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SGSVTNIQVDEHSA**T**PQR	0.999	1	2	3.3	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	**S**L**T**R**S**PPAIR	1.000	3	2	2.2	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PVNQDKFELSTDPK	1.000	1	3	4.2	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	**S**R**S**PLAIR	1.000	2	2	2.4	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SRT**S**PAPWK	0.994	1	2	2.4	NCBI
PRKD1	Serine/threonine-protein kinase D1	TI**S**PSTSNNIPLmR	0.999	1	2	2.3	NCBI
NEK10	Serine/threonine-protein kinase Nek10	KH**S**DPHLLER	1.000	1	2	2.4	NCBI
PAK4	serine/threonine-protein kinase PAK 4	DKRPL**S**GPDVSTPQPANLASGAK	1.000	1	3	3.9	NCBI
CDK14	Serine/threonine-protein kinase PFTAIRE-1	AD**S**YEKLEK	0.999	1	2	2.6	NCBI
SH3BP4	SH3 domain-binding protein 4-like	SY**S**LSELSVLQAK	1.000	1	2	4.2	NCBI
PDS5B	Sister chromatid cohesion protein PDS5-like B	HKEELLENEDEQN**S**PPK	1.000	1	3	3.9	NCBI

PDS5B	Sister chromatid cohesion protein PDS5-like B	IA**S**ESDEQQWPEEK	1.000	1	2	2.9	NCBI
SLC9A1	Sodium/hydrogen exchanger 1	SKEPSSPGTDDVFTPAPSD**S**PSSQR	0.994	1	3	4.5	NCBI
SF3A1	splicing factor 3A subunit 1 isoform 1	AEEAPSQLDQDTQVQDmDEG**S**DDDEEGQK	1.000	1	3	5.7	NCBI
SRSF4	Splicing factor, arginine/serine-rich 4	SKPSLPAE**S**R	0.996	1	2	2.3	NCBI
SVIL	Supervillin	YQ**T**QPVTLGEVEQVQSGK	1.000	1	2	5.1	NCBI
SFR1	swi5-dependent recombination DNA repair protein 1 homolog	VENT**S**DSESTKLESESDSTSVK	0.998	1	3	3.8	NCBI
SYNPO2	Synaptopodin-2	AQ**S**PTPSLPASWK	1.000	1	2	2.8	NCBI
N/A	TEL2-interacting protein 1 homolog	EKDVAEGNV**S**DLETEEEEQSSTPK	1.000	1	3	5.2	NCBI
TJP1	tight junction protein ZO-1	**S**REDLSAQPVQTK	1.000	1	2	2.3	NCBI
TJAP1	Tight junction-associated protein 1	KD**S**LTQAQEQGTLLS	0.998	1	2	3.7	NCBI
SMARCA4	transcription activator BRG1-like	KIPDPD**S**DDVSEVDAR	0.992	1	2	2.9	NCBI
SUPT5H	Transcription elongation factor SPT5	DVTNLTVGGFTPm**S**PR	1.000	1	2	3.0	NCBI
TCOF1	Treacle protein	AVVHLLSGK**S**PK	1.000	1	2	2.3	NCBI
PUS1	tRNA pseudouridine synthase A, mitochondrial isoform 1	VPSSLEGSEGDGD**T**D	1.000	1	2	2.7	NCBI
TP53BP1	Tumor suppressor p53-binding protein 1	mESLA**S**PR**S**EGDGENTQIEDTEPL**S**PVTNSK	0.998	3	3	7.6	NCBI
PTPN14	Tyrosine-protein phosphatase non-receptor type 14	RH**S**LEVmNSmVR	1.000	1	3	4.0	NCBI
PTPN21	Tyrosine-protein phosphatase non-receptor type 21	SLSDATmLIH**SS**EEEEDLDEDHSR	1.000	2	3	4.7	NCBI
SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa	YDERPGP**S**PLPHR	1.000	1	3	3.8	NCBI
UBXN7	UBX domain-containing protein 7	SESLIDASED**S**QLEAAIR	1.000	1	2	4.9	NCBI
C18orf25	Uncharacterized protein C18orf25	RD**S**SESQLASTESDKPTAGR	0.998	1	3	3.8	NCBI
ZC3HAV1	zinc finger CCCH-type antiviral protein 1	**S**AGNLLDLQITSR	1.000	1	2	4.0	NCBI
ZNF280C	Zinc finger protein 280C	NP**S**PNPVTALPK	1.000	1	2	2.8	NCBI
RSRC2	Arginine/serine-rich coiled-coil protein 2	KKEQSDVSI**S**PR	0.999	1	2	2.2	BB
BAG3	BAG family molecular chaperone regulator 3	AA**S**PFR**S**PVR	1.000	2	2	2.3	BB
DNAJC5	DnaJ homolog subfamily C member 5	SL**S**TSGESLYHVLGLDK	0.998	1	2	3.2	BB
USO1	General vesicular transport factor p115	NLGHPVEEEDE**S**GDQEDDDDEmDDGDKDQDx	1.000	1	3	8.5	BB
NAF1	H/ACA ribonucleoprotein complex non-core subunit NAF1	NDQEPPPEALDF**S**DDEKEK	1.000	1	2	3.8	BB
Htatsf1	HIV Tat-specific factor 1 homolog	LFDD**S**DER	1.000	1	2	2.8	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	IKGDVPSVGLEGPDIDLQ**S**PEGK	1.000	1	3	5.6	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	LP**S**GSGVASPTTGSAmDIR	0.995	1	2	4.2	BB
NUMA1	Nuclear mitotic apparatus protein 1	LPcTQPDGTSVPGEPA**S**PISQR	1.000	1	2	2.8	BB
NCL	Nucleolin	EVEED**S**EDEEm**S**EDEEDDSSGEEVVIPQKK	1.000	2	3	4.9	BB

EBAG9	Receptor-binding cancer antigen expressed on SiSo cells	KL**S**GDQITLPTSVDYSSVPK	1.000	1	2	5.3	BB
USP7	Ubiquitin carboxyl-terminal hydrolase 7	AGEQQL**S**EPEDmEmEAGDTDDPPR	1.000	1	3	4.8	BB
UBE2J1	Ubiquitin-conjugating enzyme E2 J1	RS**S**TSPDVIQGQPPR	0.999	1	2	3.4	BB

Table 4.3.3: List of phosphopeptides identified as unique to Iron phosphopeptide enrichment of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
TNKS1BP1	182 kDa tankyrase-1-binding protein	KEIPA**S**PDR	1.000	1	2	2.8	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	MQAGSQ**S**PSNVDLEDK	0.999	1	2	5.0	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	NR**S**AEEGEVTESK	1.000	1	3	4.9	BB/NCBI
PLCB3	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase beta-3	**S**LGEEGLNR	1.000	1	2	2.5	BB/NCBI
PSMD2	26S proteasome non-ATPase regulatory subunit 2	DK**T**PVQSQQPSATAPAGADEK	1.000	1	3	4.4	BB/NCBI
PSMD2	26S proteasome non-ATPase regulatory subunit 2	FGG**S**GSQVDSAR	0.999	1	2	3.2	BB/NCBI
ANLN	actin-binding protein anillin	EIEM**S**VDDDDINSSK	1.000	1	2	3.1	BB/NCBI
ANLN	actin-binding protein anillin	EPLSEASNQQPL**S**GGEEK	1.000	1	2	2.6	BB/NCBI
ANLN	actin-binding protein anillin	SSSASGASASINSSSVQQEATcc**S**PR	1.000	1	3	4.9	BB/NCBI
AMBRA1	activating molecule in BECN1-regulated autophagy protein 1	LELSSSA**S**PQEER	1.000	1	2	3.5	BB/NCBI
ADNP	activity-dependent neuroprotector homeobox protein-like	LNQ**S**PGLAPVK	1.000	1	2	3.1	BB/NCBI
ZFAND5	AN1-type zinc finger protein 5-like	M**S**PMGTASGSNSPTSDSASVQR	0.997	1	2	4.6	BB/NCBI
ANKIB1	ankyrin repeat and IBR domain-containing protein 1	GVAPAD**S**PDAPR	1.000	1	2	2.6	BB/NCBI
ANKRD17	ankyrin repeat domain-containing protein 17-like	NSPLDcGAA**S**PNK	1.000	1	2	2.6	BB/NCBI
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	HL**S**QTEPEQK	1.000	1	2	3.1	BB/NCBI
AGFG1	Arf-GAP domain and FG repeats-containing protein 1	GTPSQ**S**PVVGR	0.999	1	2	2.5	BB/NCBI
ACAP2	Arf-GAP with coiled-coil, ANK repeat and PH domain-containing protein 2	SSPSTG**S**LDSGNESK	0.999	1	2	3.7	BB/NCBI
DDX24	ATP-dependent RNA helicase DDX24	KL**S**PSQSTVSK	0.991	1	2	2.2	BB/NCBI
ARID5B	AT-rich interactive domain-containing protein 5B	AV**S**PLDPAK	1.000	1	2	2.5	BB/NCBI
BAG3	BAG family molecular chaperone regulator 3	**S**PENEDPQTESQQPEAK	1.000	1	2	2.9	BB/NCBI
BSG	Basigin	KPDQ**T**LDEDDPGAAPLK	1.000	1	3	3.9	BB/NCBI
CDCA8	borealin-like	LTAEAIQ**T**PLK	1.000	1	2	2.9	BB/NCBI
BRAP	BRCA1-associated protein	QSESVNTAPD**S**PSK	1.000	1	2	3.1	BB/NCBI
BAZ1A	bromodomain adjacent to zinc finger domain protein 1A	DLDPDMV**T**EDEDDPGSQR	1.000	1	2	3.4	BB/NCBI
BAZ2A	Bromodomain adjacent to zinc finger domain protein 2A	ELTGPDTPA**S**PAR	1.000	1	2	2.9	BB/NCBI
BUD13	BUD13-like	HD**T**PDP**S**PPR	1.000	2	2	2.5	BB/NCBI
BUD13	BUD13-like	ND**T**PDP**S**PPR	1.000	2	2	2.4	BB/NCBI
BUD13	BUD13-like	RAHHD**T**PDP**S**PR	1.000	2	2	2.4	BB/NCBI
CARHSP1	calcium-regulated heat stable protein 1-like	DR**S**PSPLR	1.000	1	2	2.4	BB/NCBI
CNOT2	CCR4-NOT transcription complex subunit 2-like	TNSMSSSGLG**S**PNR	1.000	1	2	3.3	BB/NCBI
CDC42EP1	Cdc42 effector protein 1	RSD**S**LLSFR	1.000	1	2	3.1	BB/NCBI

N/A	Cell division cycle 2-related protein kinase 7	DSKG**S**PITLTK	0.990	1	2	2.8	BB/NCBI
CDK3	Cell division protein kinase 3	IGEGT**Y**GVVYK	0.997	1	2	3.3	BB/NCBI
KIF4A	Chromosome-associated kinesin KIF4	NQ**S**LVEENEK	1.000	1	2	2.8	BB/NCBI
CPSF7	cleavage and polyadenylation specificity factor subunit 7 isoform 1	DSSDSADGRA**T**PSENLVPSSAR	0.999	1	3	4.3	BB/NCBI
CCDC86	coiled-coil domain-containing protein 86-like	QEAGFG**S**PQR	1.000	1	2	2.2	BB/NCBI
GPS1	COP9 signalosome complex subunit 1	EGSQGEL**T**PANSQSR	1.000	1	2	3.2	BB/NCBI
SPRR1A	cornifin-A-like	APEPcHPVVPEPcPSNV**T**PEPcQQK	1.000	1	3	6.1	BB/NCBI
CCNK	Cyclin-K	KP**S**PQP**S**PPR	1.000	2	2	2.7	BB/NCBI
DOCK7	dedicator of cytokinesis protein 7	SM**S**IDDTPR	1.000	1	2	2.7	BB/NCBI
DTL	Denticleless protein-like	AGLVMVASSQT**T**PAK	0.990	1	2	2.4	BB/NCBI
LIG1	DNA ligase 1	HAEASK**S**PESGTLTK	0.999	1	3	4.2	BB/NCBI
MSH6	DNA mismatch repair protein Msh6	DNP**S**E**S**EEELQPK	1.000	2	2	2.8	BB/NCBI
MCM7	DNA replication licensing factor MCM7	SEDDAAEAGEL**S**GEELK	1.000	1	2	2.5	BB/NCBI
TWISTNB	DNA-directed RNA polymerase I subunit RPA43	HREEIDSA**S**PK	1.000	1	2	2.3	BB/NCBI
DBN1	Drebrin	**S**PSDSSTASTPVTEQIER	0.993	1	2	3.3	BB/NCBI
PJA1	E3 ubiquitin-protein ligase Praja-1 isoform 1	ARD**S**EEEGAGPVDR	1.000	1	2	3.7	BB/NCBI
EEF1B2	elongation factor 1-beta-like	YGPA**S**VEDTTGSGTADAK	1.000	1	2	3.3	BB/NCBI
EEF1D	Elongation factor 1-delta	ATAPQTQHV**S**PmR	0.999	1	2	2.4	BB/NCBI
EEF2	Elongation factor 2	IMGPNY**T**PGKK	0.998	1	2	3.3	BB/NCBI
EDC3	enhancer of mRNA-decapping protein 3-like	SQDVAV**S**PQQQQcSK	1.000	1	2	4.5	BB/NCBI
ESF1	ESF1-like	DSSTSEIVK**S**PTAAcSK	0.998	1	2	2.7	BB/NCBI
ESF1	ESF1-like	IGSEI**S**PK	1.000	1	2	2.4	BB/NCBI
EIF2S1	eukaryotic translation initiation factor 2 subunit 1-like	ENAEVDGDDD**T**EEMEAK	1.000	1	2	3.5	BB/NCBI
EIF3J	eukaryotic translation initiation factor 3 subunit J-like	VL**T**PEEQLADK	1.000	1	2	2.7	BB/NCBI
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	TS**S**PTTLAPLAR	0.999	1	2	3.1	BB/NCBI
FASN	fatty acid synthase	LGML**S**PEGTcK	0.999	1	2	2.3	BB/NCBI
ALDOA	fructose-bisphosphate aldolase A isoform 1	LQ**S**IGTENTEENR	0.993	1	2	2.5	BB/NCBI
SLC35C1	GDP-fucose transporter 1	MALTGG**S**TASEEADEDSR	0.994	1	2	3.7	BB/NCBI
GTF2F1	general transcription factor IIF subunit 1	MDAAPQSL**S**GK	0.993	1	2	2.6	BB/NCBI
GPHN	Gephyrin	ASH**S**AVDITK	1.000	1	2	2.5	BB/NCBI
HEATR3	HEAT repeat-containing protein 3	EcSTGLDSNEM**S**PQEK	1.000	1	2	3.3	BB/NCBI
HN1L	Hematological and neurological expressed 1-like protein	G**S**GIFDESTPVQTR	1.000	1	2	2.5	BB/NCBI
HGSNAT	Heparan-alpha-glucosaminide N-acetyltransferase	LINSELG**S**PSR	0.995	1	2	3.0	BB/NCBI
HDGFRP2	Hepatoma-derived growth factor-related protein 2	SEGI**S**LDR	1.000	1	2	2.4	BB/NCBI
HNRNPCL1	Heterogeneous nuclear ribonucleoprotein C-like 1	NEK**S**EEEQSSASVK	1.000	1	2	3.4	BB/NCBI
KAT7	Histone acetyltransferase MYST2	SQQQPNPV**T**PK	1.000	1	2	3.1	BB/NCBI
HDAC6	Histone deacetylase 6	MTNPV**S**PMGVTTPK	0.991	1	2	2.4	BB/NCBI
HDAC6	Histone deacetylase 6	QTTEA**S**PIQGATAQQAPDQLTGR	1.000	1	3	4.8	BB/NCBI

EZH2	histone-lysine N-methyltransferase EZH2 isoform 1	ESSVIAPVPTEDVD**T**PPR	0.990	1	2	2.7	BB/NCBI
KMT2D	Histone-lysine N-methyltransferase MLL2	ASQVEPQ**S**PGLGLR	1.000	1	2	2.5	BB/NCBI
SETD2	histone-lysine N-methyltransferase SETD2-like	KLDE**S**PILK	1.000	1	2	2.4	BB/NCBI
SETD2	histone-lysine N-methyltransferase SETD2-like	LPT**S**EPEADTEAELK	0.995	1	2	3.1	BB/NCBI
SETD2	histone-lysine N-methyltransferase SETD2-like	MDTGDTFPTTEES**S**PPK	0.999	1	2	3.0	BB/NCBI
Htatsf1	HIV Tat-specific factor 1-like	mD**S**VSASEQAGPSR	1.000	1	2	3.6	BB/NCBI
HYPK	huntingtin-interacting protein K	KHD**S**GAADLER	1.000	1	2	2.5	BB/NCBI
N/A	hypothetical protein I79_015376	KQI**T**VEELVR	1.000	1	2	3.2	BB/NCBI
N/A	hypothetical protein I79_015376	SSSVGSSSSYPI**S**PAVSR	1.000	1	2	3.7	BB/NCBI
N/A	hypothetical protein I79_019528	RT**S**DSAFQPK	0.993	1	2	2.3	BB/NCBI
N/A	hypothetical protein LOC100760903	TQQ**S**LEPEPK	0.999	1	2	3.4	BB/NCBI
IKBKB	inhibitor of nuclear factor kappa-B kinase subunit beta-like	GPVSG**S**PDSMNVSR	0.999	1	2	2.8	BB/NCBI
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	GMG**S**LDAMDK	1.000	1	2	2.2	BB/NCBI
KTN1	kinectin	EIQNGAIHE**S**DSENVLR	0.998	1	2	2.3	BB/NCBI
KLC1	Kinesin light chain 1	VD**S**PTVTTTLK	1.000	1	2	2.4	BB/NCBI
KIF15	Kinesin-like protein KIF15	GLQGF**S**PK	1.000	1	2	2.3	BB/NCBI
KIF27	Kinesin-like protein KIF27	IILDLISE**S**PIK	1.000	1	2	3.3	BB/NCBI
N/A	Lamin-L(I)	LKL**S**P**S**PSSR	1.000	2	2	2.4	BB/NCBI
LRRFIP2	Leucine-rich repeat flightless-interacting protein 2	NSASATTPLSGNS**S**R	0.990	1	2	3.3	BB/NCBI
LRRC16A	Leucine-rich repeat-containing protein 16A	LEDLDTcMM**T**PK	1.000	1	2	3.1	BB/NCBI
PPFIA1	Liprin-alpha-1	VG**S**GSLDNLGR	0.999	1	2	2.4	BB/NCBI
MSL1	Male-specific lethal 1-like	H**S**PIKEEPcGSLSETVcK	1.000	1	3	4.9	BB/NCBI
MSL1	Male-specific lethal 1-like	**S**PLGGGGGSGASSQAAcLK	1.000	1	2	4.4	BB/NCBI
NF2	Merlin	RL**S**MEIEK	1.000	1	2	2.4	BB/NCBI
MTA1	Metastasis-associated protein MTA1	SSSSVLSSL**T**PAK	1.000	1	2	3.3	BB/NCBI
DGCR8	Microprocessor complex subunit DGCR8	LLIDPNcSGH**S**PR	0.995	1	2	2.3	BB/NCBI
TRMT10C	Mitochondrial ribonuclease P protein 1	**S**ADEEAADLPTKPTK	1.000	1	2	2.8	BB/NCBI
MAP3K7	Mitogen-activated protein kinase kinase kinase 7	M**S**ADMSEIEAR	1.000	1	2	2.2	BB/NCBI
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	AA**S**SLNLSNGETESVK	0.993	1	2	3.3	BB/NCBI
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	RD**S**PLQGSGQQNSQAGQR	1.000	1	3	3.9	BB/NCBI
MPHOSPH 8	M-phase phosphoprotein 8	LP**S**PMSIQAPK	1.000	1	2	3.3	BB/NCBI
MYBBP1A	Myb-binding protein 1A	ANTPSQVNG**T**PVTK	0.998	1	2	2.5	BB/NCBI
BIN1	Myc box-dependent-interacting protein 1	GNK**S**P**S**PPPDGSPAATPEIR	1.000	3	3	3.9	BB/NCBI
MEF2C	myocyte-specific enhancer factor 2C-like isoform 1	N**S**PGLLVSPGNLNK	1.000	1	2	2.6	BB/NCBI
MYO9A	Myosin-IXa	AA**S**AcEALGTEGPLGQAK	1.000	1	2	3.1	BB/NCBI
MYO9B	Myosin-IXb	ISSSTSDISRL**S**PVK	0.994	1	2	2.8	BB/NCBI
NAV3	Neuron navigator 3	SQ**S**FNSIDK	0.999	1	2	2.6	BB/NCBI
NIPBL	nipped-B-like protein	GSRPPLILQSQSLPcS**S**PR	0.991	1	3	4.3	BB/NCBI

NKTR	NK-tumor recognition protein	QDSSASLA**S**PVEIAGK	1.000	1	2	2.2	BB/NCBI
NFIB	nuclear factor 1 B-type	DQDMS**S**PTTMK	0.994	1	2	2.3	BB/NCBI
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	GADNDG**S**GSESGYTTPK	0.997	1	2	4.6	BB/NCBI
NUMA1	Nuclear mitotic apparatus protein 1	VSSETHQGPG**T**PESK	0.993	1	2	2.2	BB/NCBI
NUP88	Nuclear pore complex protein Nup88	ILAE**T**PDSFEK	1.000	1	2	3.0	BB/NCBI
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	ATVTP**S**PVKGK	0.998	1	2	2.3	BB/NCBI
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	NSQED**S**ED**S**EEKDVK	1.000	2	2	2.7	BB/NCBI
YBX1	nuclease-sensitive element-binding protein 1-like	NEGSE**S**APEGQAQQR	1.000	1	2	3.5	BB/NCBI
NOL11	Nucleolar protein 11	**S**ETNLQAEVPGSK	1.000	1	2	2.9	BB/NCBI
NOP58	Nucleolar protein 58	EEPL**S**DEEPcTSTAIPSPEK	0.997	1	2	2.4	BB/NCBI
DDX21	Nucleolar RNA helicase 2	SP**S**EDDMEPPK	1.000	1	2	3.2	BB/NCBI
NCL	Nucleolin	ALVA**T**PGKK	1.000	1	2	2.7	BB/NCBI
NCL	nucleolin	GL**S**EDTTEETLK	0.999	1	2	2.3	BB/NCBI
NUP35	nucleoporin NUP53-like	GALSSPSLAF**T**PIK	1.000	1	2	2.9	BB/NCBI
NACC1	nucleus accumbens-associated protein 1	FS**T**PDLAINR	1.000	1	2	2.9	BB/NCBI
OTUD4	OTU domain-containing protein 4	KTDIALASG**S**PGVEGK	1.000	1	3	4.5	BB/NCBI
PSIP1	PC4 and SFRS1-interacting protein	QSNAS**S**DVEVEEK	0.995	1	2	2.4	BB/NCBI
GIGYF2	PERQ amino acid-rich with GYF domain-containing protein 2 isoform 1	ALSSGGSIT**S**PPLSPALPK	0.999	2	2	3.9	BB/NCBI
PHF14	PHD finger protein 14	SNED**S**LILEK	1.000	1	2	2.5	BB/NCBI
PHF1	PHD finger protein 2	LEK**S**PLAGNK	1.000	1	2	3.0	BB/NCBI
PHF8	PHD finger protein 8	SSGSSSSGLGTVSN**S**PVSQR	0.998	1	2	3.4	BB/NCBI
PI4KA	Phosphatidylinositol 4-kinase alpha	TSSVSSISQV**S**PER	1.000	1	2	3.2	BB/NCBI
PKP4	Plakophilin-4	VG**S**PLTLTDAQTR	1.000	1	2	2.5	BB/NCBI
PARG	poly(ADP-ribose) glycohydrolase	LENVPQLNLDK**S**PIEK	1.000	1	2	3.6	BB/NCBI
SMARCA1	probable global transcription activator SNF2L1	ST**S**PLQLK	0.994	1	2	2.5	BB/NCBI
PSME4	Proteasome activator complex subunit 4	NPSINQTLL**S**PEK	1.000	1	2	3.2	BB/NCBI
DBF4	Protein DBF4-like A	AASMLNA**S**EPDIK	1.000	1	2	2.7	BB/NCBI
FAM172A	protein FAM172A-like, partial	QL**S**ADGTDEPAEK	1.000	1	2	2.3	BB/NCBI
FRYL	protein furry homolog-like isoform 1	SN**T**LDIMDGR	0.999	1	2	3.0	BB/NCBI
JADE3	Protein Jade-3	**S**PQMPEEPLDMNVK	1.000	1	2	2.2	BB/NCBI
KIAA1967	protein KIAA1967 homolog	EAAPDTGAEP**S**PVDSDPTYSSK	1.000	1	2	3.5	BB/NCBI
LIN54	protein lin-54 homolog	IAI**S**PLK**S**PNK	1.000	2	2	2.8	BB/NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	LA**S**TSDIEEK	0.991	1	2	2.7	BB/NCBI
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	**S**PLIESTANMENNQPQK	1.000	1	2	3.0	BB/NCBI
PRRC2A	protein PRRC2A-like	EGPEPAEEVPPPTT**S**PAPK	0.991	1	2	3.3	BB/NCBI
S100A13	Protein S100-A13	KG**S**LSINEFK	0.999	1	2	2.5	BB/NCBI

SPDL1	Protein Spindly	LVD**S**PVSADALR	1.000	1	2	3.3	BB/NCBI
FAT1	protocadherin Fat 1-like	DMPAAG**S**LGSSSR	1.000	1	2	2.8	BB/NCBI
PUM2	Pumilio-like 2	QA**S**PTEVVER	1.000	1	2	2.3	BB/NCBI
MYCBP2	putative E3 ubiquitin-protein ligase MYCBP2	VN**S**GDTEVGSSLLR	1.000	1	2	2.3	BB/NCBI
HNRNPA1	Putative heterogeneous nuclear ribonucleoprotein A1-like protein 3	SE**S**PKEPEQLR	1.000	1	2	2.6	BB/NCBI
SCAF8	Putative RNA-binding protein 16	TSEPVKETVQTTQ**S**PTPVEK	0.999	1	3	4.0	BB/NCBI
RAPGEF1	Rap guanine nucleotide exchange factor 1	VVDN**S**PPALPPK	1.000	1	2	2.4	BB/NCBI
RIN2	Ras and Rab interactor 2	VHSQDL**S**PGPK	1.000	1	2	2.6	BB/NCBI
RAB34	ras-related protein Rab-34-like isoform 1	IN**S**DDKNLYLTASK	1.000	1	2	3.3	BB/NCBI
RRAS2	ras-related protein R-Ras2-like	FQEQEcPP**S**PEPTR	1.000	1	2	4.0	BB/NCBI
RB1CC1	RB1-inducible coiled-coil protein 1	**S**VEHVAPDPTDAER	1.000	1	2	2.7	BB/NCBI
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	ASVGQ**S**PVLPSTTFK	0.995	1	2	2.4	BB/NCBI
RPTOR	Regulatory-associated protein of mTOR	GMLIHQVGG**S**PPASSTSScSLTNDVAK	1.000	1	3	3.9	BB/NCBI
RSF1	Remodeling and spacing factor 1	GLSEGQ**S**PENAIPEILK	1.000	1	2	2.7	BB/NCBI
RBBP6	Retinoblastoma-binding protein 6	SR**S**PQAFR	1.000	1	2	2.5	BB/NCBI
RBL1	Retinoblastoma-like protein 1	VIAISGDAE**S**PAK	1.000	1	2	3.3	BB/NCBI
ARHGAP1	rho GTPase-activating protein 1	SS**S**PEPVTHLK	0.994	1	2	2.5	BB/NCBI
ARHGAP29	rho GTPase-activating protein 29	AEEEQLSS**S**AGLAK	0.997	1	2	3.8	BB/NCBI
ARHGAP29	rho GTPase-activating protein 29	GLTANIGN**S**EDHSSR	1.000	1	2	3.4	BB/NCBI
N/A	riboflavin transporter 2-like isoform 1	DAEDAS**S**LGAPVTSPGK	0.997	1	2	3.8	BB/NCBI
CTR9	RNA polymerase-associated protein CTR9 homolog	GEEG**S**DDDETENGPKPK	1.000	1	2	2.7	BB/NCBI
RPUSD2	RNA pseudouridylate synthase domain-containing protein 2	IAEAPSQDLD**T**PEK	1.000	1	2	2.3	BB/NCBI
RBM5	RNA-binding protein 5	LQSFD**S**PER	1.000	1	2	2.5	BB/NCBI
SLTM	SAFB-like transcription modulator	DGQDAIAQ**S**PEK	1.000	1	2	3.9	BB/NCBI
SLTM	SAFB-like transcription modulator	KED**S**VKGDPVEK	1.000	1	2	2.8	BB/NCBI
SENP3	sentrin-specific protease 3	R**S**PPVPSGPPMEEDGLR	1.000	1	3	3.8	BB/NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	KVEL**S**ESEEDK	0.992	1	2	3.0	BB/NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	KPIDSLRD**S**R	0.991	1	2	2.2	BB/NCBI
STK10	Serine/threonine-protein kinase 10	EVTGQAEDS**S**PVASK	0.996	1	2	3.4	BB/NCBI
STK10	Serine/threonine-protein kinase 10	SRPL**S**MDAR	1.000	1	2	2.3	BB/NCBI
BRAF	serine/threonine-protein kinase B-raf	SA**S**EPSLNR	0.999	1	2	2.3	BB/NCBI
SRPK1	serine/threonine-protein kinase SRPK1-like	QEESE**S**PVETPLTENPPNK	0.996	1	2	4.4	BB/NCBI
SORT1	Sortilin	GVNTF**S**PEGR	0.999	1	2	2.3	BB/NCBI
SPAST	spastin	AP**S**cSGLSMVSGGR	1.000	1	2	3.1	BB/NCBI
SSFA2	Sperm-specific antigen 2-like	SLA**S**IEAQcSGMSSEK	1.000	1	2	3.3	BB/NCBI
STMN2	Stathmin-2	DL**S**LEEIQK	1.000	1	2	2.7	BB/NCBI
STIM1	Stromal interaction molecule 1	AVAEEDNGSIGEETDS**S**PGR	0.990	1	2	4.9	BB/NCBI

SMARCE1	SWI/SNF-related matrix-associated actin-dependent regulator chromatin subfamily E member 1	SQGSIAPEEEQVANK	0.998	1	2	3.1	BB/NCBI
TBC1D15	TBC1 domain family member 15	DDSSAQTLASPNAcR	1.000	1	2	3.0	BB/NCBI
RIF1	Telomere-associated protein RIF1	SHEDEISSPVNK	0.999	1	2	3.4	BB/NCBI
TERF2IP	telomeric repeat-binding factor 2-interacting protein 1	YLLGDAPVSPSSQK	0.996	1	2	3.4	BB/NCBI
TNS1	Tensin-1	TVGTNTPPSPGFGR	0.998	1	2	3.3	BB/NCBI
TTC7B	Tetratricopeptide repeat protein 7B	VEQALSEVASSLQSSAPK	1.000	2	2	3.6	BB/NCBI
THOC2	THO complex subunit 2	TPVSGSLKSPVPR	1.000	1	2	2.9	BB/NCBI
TCEA1	transcription elongation factor A protein 1-like	EPTISSQNSPEAR	0.999	1	2	2.2	BB/NCBI
TAF6	transcription initiation factor TFIID subunit 6-like	QEAGDSPPPAPGTPK	1.000	2	2	2.4	BB/NCBI
TRAM1	Translocating chain-associated membrane protein 1	KGTENGVNGAVTSNGADSPR	1.000	1	3	3.8	BB/NCBI
SEC62	Translocation protein SEC62	EELEQQTDGDcDEEDDDKDGEMPK	1.000	1	3	4.1	BB/NCBI
TMEM115	transmembrane protein 115-like	DSPLPSEEASTPPGK	0.996	1	2	2.9	BB/NCBI
TBCB	Tubulin-folding cofactor B	cEVQSPGQSLR	1.000	1	2	2.2	BB/NCBI
TP53BP1	Tumor suppressor p53-binding protein 1	DSVEEDSPQPPLPSVK	0.997	1	2	2.2	BB/NCBI
YARS	tyrosyl-tRNA synthetase, cytoplasmic	LSAGSGESGAMGDAPSPEEK	1.000	1	2	3.7	BB/NCBI
PRPF3	U4/U6 small nuclear ribonucleoprotein Prp3	GDDDEESDEEAVKK	1.000	1	2	3.4	BB/NCBI
UCHL1	Ubiquitin carboxyl-terminal hydrolase 1	ATGDTLEISPK	1.000	1	2	3.1	BB/NCBI
USP36	ubiquitin carboxyl-terminal hydrolase 36	DTIFSTSPK	0.998	1	2	2.3	BB/NCBI
USP36	ubiquitin carboxyl-terminal hydrolase 36	LQSPEEVGAPVSR	1.000	1	2	4.3	BB/NCBI
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	SAADSISESVPVGPK	0.991	1	2	3.0	BB/NCBI
UBE4B	ubiquitin conjugation factor E4 B-like	SQSMDIDGVScEK	0.997	1	2	4.3	BB/NCBI
UBAP2L	Ubiquitin-associated protein 2-like	SANDSTVHSPFTK	1.000	1	2	2.5	BB/NCBI
UBAP2L	Ubiquitin-associated protein 2-like	YPSSISSSPQK	0.992	1	2	2.5	BB/NCBI
C12orf45	Uncharacterized protein C12orf45-like	IEVLDSPASK	0.990	1	2	2.5	BB/NCBI
TICRR	Uncharacterized protein C15orf42-like	LHPDGSPDMAVEK	1.000	1	2	2.7	BB/NCBI
C9orf142	Uncharacterized protein C9orf142-like	LAAAEEIATSPR	0.995	1	2	3.1	BB/NCBI
KIAA1614	Uncharacterized protein KIAA1614	YNQSISLR	1.000	1	2	2.2	BB/NCBI
URI1	unconventional prefoldin RPB5 interactor-like	SLScEEASEGR	0.999	1	2	2.3	BB/NCBI
KCNAB2	Voltage-gated potassium channel subunit beta-2	RSSLVITTK	0.993	1	2	2.3	BB/NCBI
KCNAB2	voltage-gated potassium channel subunit beta-2-like isoform 1	MYPESTTGSPAR	1.000	1	2	2.8	BB/NCBI
WAPAL	wings apart-like protein homolog	SESPSEScPVK	1.000	1	2	2.6	BB/NCBI
SLC7A6	Y+L amino acid transporter 2	EDVSSPSPGPAETVQLK	1.000	1	2	2.5	BB/NCBI
YEATS2	YEATS domain-containing protein 2	LPVASQVPQGTGSPIPK	0.997	1	2	3.2	BB/NCBI
ZC3H13	Zinc finger CCCH domain-containing protein 13	SKLSPSPSLR	0.993	2	2	2.3	BB/NCBI
ZC3H18	zinc finger CCCH domain-containing protein 18 isoform 2	ASDLEDEENATR	1.000	1	2	2.3	BB/NCBI
ZNF106	zinc finger protein 106	LSFTPETPVEK	1.000	1	2	2.4	BB/NCBI
ZNF326	zinc finger protein 326	MNLSKSPAK	0.999	1	2	3.3	BB/NCBI

ZNF609	zinc finger protein 609-like, partial	LVEPH**S**P**S**PSSK	0.992	2	2	2.5	BB/NCBI
ZNF638	Zinc finger protein 638	IPP**S**PELNLK	1.000	1	2	2.3	BB/NCBI
ZNF740	zinc finger protein 740-like	AG**S**PEVLR	1.000	1	2	2.3	BB/NCBI
ZNF438	zinc finger protein 828	AGPA**S**PESVK	1.000	1	2	2.7	BB/NCBI
ZNF438	zinc finger protein 828	cDSVVQEGLLA**T**PK	1.000	1	2	4.0	BB/NCBI
RLF	Zinc finger protein Rlf	SY**S**PEPSIcASK	0.999	1	2	2.8	BB/NCBI
ELAC2	zinc phosphodiesterase ELAC protein 2-like, partial	QSSSDSASTDVSAENGER**S**PDGSSTGAD R	1.000	1	3	4.3	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	NIAPGAGc**S**PGQPR	1.000	1	2	2.6	NCBI
AKAP1	A kinase anchor protein 1, mitochondrial	DNN**S**KVELSLMGDEVK	1.000	1	2	3.4	NCBI
APEH	acylamino-acid-releasing enzyme-like isoform 1	ALDINA**S**DDEMARPK	1.000	1	2	2.6	NCBI
AKAP12	A-kinase anchor protein 12	TEDSGTEQLA**S**DVELSK	0.998	1	2	3.2	NCBI
AKAP13	A-kinase anchor protein 13-like	SGSLDSELSV**S**PK	1.000	1	2	2.8	NCBI
AKAP2	A-kinase anchor protein 2	SP**S**DTMAEGER	0.990	1	2	2.3	NCBI
AKAP2	A-kinase anchor protein 2	VScVSD**S**PSAGAGPGSTATQGK	0.998	1	2	3.6	NCBI
Aplf	aprataxin and PNK-like factor isoform 1	TTGTSQLQG**S**PEITK	0.999	1	2	2.9	NCBI
ATXN2	ataxin-2	AL**T**PSIEAK	1.000	1	2	2.4	NCBI
ATXN2	ataxin-2	MSSEGPPRM**S**PK	1.000	1	2	2.4	NCBI
ATXN2L	Ataxin-2-like protein	MYPPR**S**PK	1.000	1	2	2.3	NCBI
BCL9	B-cell CLL/lymphoma 9 protein	SLDRD**S**PGVENK	0.999	1	2	2.3	NCBI
CAST	Calpastatin	DT**S**PAPVAEAVPR	0.995	1	2	3.1	NCBI
CDC42EP4	cdc42 effector protein 4-like	AGEADSE**S**LDEQASTSSSSK	1.000	1	2	6.4	NCBI
CDCA2	Cell division cycle-associated protein 2	ISSQN**S**PDDHLSSAK	0.992	1	2	3.1	NCBI
CENPC	centromere protein C 1	ANE**S**LVVHR	1.000	1	2	2.6	NCBI
CENPC	centromere protein C 1	HNLPSSENIV**T**PEDK	0.999	1	2	3.3	NCBI
CENPU	centromere protein U-like	SL**S**PSESESSENK	0.992	1	2	2.5	NCBI
CHTF18	Chromosome transmission fidelity protein 18-like	GTMQALP**S**PR	1.000	1	2	2.3	NCBI
CIT	Citron Rho-interacting kinase	SESVVSGLD**S**PAK	1.000	1	2	3.6	NCBI
CPSF3	Cleavage and polyadenylation specificity factor subunit 3	LYAAL**T**PVH	1.000	1	2	2.3	NCBI
CLASP1	CLIP-associating protein 1	NSSNTNVG**S**PSNTIGR	0.999	1	2	3.2	NCBI
CLASP1	CLIP-associating protein 1	SVSTTG**S**LQR	0.993	1	2	2.3	NCBI
Cc2d1b	coiled-coil and C2 domain-containing protein 1B-like	EAT**S**PDLSEEK	0.995	1	2	2.2	NCBI
CCDC12	coiled-coil domain-containing protein 12-like	GQEDNLASAVDATTGQEAcD**S**D	1.000	1	2	5.6	NCBI
N/A	coiled-coil domain-containing protein 165-like, partial	REGPVGGE**S**DSEDVcEK	0.999	1	2	3.1	NCBI
DAB2IP	disabled homolog 2-interacting protein isoform 1	LP**S**PTPENK	1.000	1	2	2.6	NCBI
DNMT3A	DNA (cytosine-5)-methyltransferase 3A	SEPQPEEG**S**PAAGQK	1.000	1	2	2.5	NCBI
ERCC6	DNA excision repair protein ERCC-6	LDE**SS**EEESAR	1.000	2	2	3.3	NCBI
XRCC1	DNA repair protein XRCC1	ALGSScKPQE**S**PK	1.000	1	2	2.7	NCBI
HUWE1	E3 ubiquitin-protein ligase HUWE1	AE**S**PEEVAcR	1.000	1	2	3.2	NCBI

EPS8	epidermal growth factor receptor kinase substrate 8	ISAAASDSGVE**S**FDEGSGH	1.000	1	2	4.7	NCBI
ELF2	ETS-related transcription factor Elf-2-like isoform 1	TQQSPVSNG**S**PELGIK	1.000	1	2	3.7	NCBI
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	KAA**S**LTEDR	1.000	1	2	3.1	NCBI
EIF5B	eukaryotic translation initiation factor 5B-like	WDG**S**EEDEDNSKR	1.000	1	2	2.6	NCBI
FLNA	Filamin-A	cSGPGL**S**PGMVR	1.000	1	2	2.8	NCBI
FLNA	Filamin-A	IV**S**PSGAAVScK	1.000	1	2	2.6	NCBI
FOXK1	forkhead box protein K1-like	SSGLQ**T**PEcL**S**R	1.000	2	2	2.6	NCBI
GAS2L1	GAS2-like protein 1	LTSGLPA**S**PR	1.000	1	2	2.4	NCBI
HEATR6	HEAT repeat-containing protein 6	VPGGSSLEEVSVS**S**PK	0.993	1	2	4.0	NCBI
HSP90AB1	heat shock protein HSP 90-beta-like	EI**S**DDEAEEEK	1.000	1	2	2.2	NCBI
SRCAP	helicase SRCAP-like	SEADGG**S**GPPTPGPTTTLGPK	0.997	2	2	2.3	NCBI
HIRIP3	HIRA-interacting protein 3-like	LTGGLGD**S**EEEK	1.000	1	2	2.4	NCBI
HIRIP3	HIRA-interacting protein 3-like	TGTVGcVN**S**E**S**DMER	1.000	2	2	2.9	NCBI
KMT2D	Histone-lysine N-methyltransferase MLL2	LcPQPEELPL**S**PR	1.000	1	2	2.3	NCBI
KMT2D	Histone-lysine N-methyltransferase MLL2	LEGPA**S**PDVEPGKEETEESK	1.000	1	3	3.9	NCBI
SETD2	histone-lysine N-methyltransferase SETD2-like	cEENT**S**PVLDAVQSK	0.992	1	2	3.3	NCBI
DOT1L	Histone-lysine N-methyltransferase, H3 lysine-79 specific	AAATEAPVD**S**GAEEEK	1.000	1	2	2.9	NCBI
Htatsf1	HIV Tat-specific factor 1-like	VLGEEG**S**ER	1.000	1	2	2.3	NCBI
N/A	hypothetical protein I79_019528	DNNT**S**LTALEK	0.996	1	2	3.6	NCBI
N/A	hypothetical protein I79_019528	LTLSEGHPE**T**PVDGDAGK	1.000	1	2	2.5	NCBI
N/A	hypothetical protein LOC100756984, partial	RDHLDTPEDEL**S**DEPR	1.000	1	3	3.8	NCBI
RHBDF2	inactive rhomboid protein 2	GVPQSA**S**PVSPDGVQIPLK	1.000	2	2	5.0	NCBI
INCENP	Inner centromere protein	**S**PLGDVQSVPLAK	1.000	1	2	2.3	NCBI
INCENP	Inner centromere protein	TP**S**PPcPANK	1.000	1	2	2.8	NCBI
INO80E	INO80 complex subunit E-like	GSGASVGAAL**S**PLPPPK	1.000	1	2	2.9	NCBI
IRS2	insulin receptor substrate 2, partial	RV**S**GDGAQDLDR	1.000	1	2	2.6	NCBI
ITSN1	intersectin-1 isoform 2	LPEEPA**S**EDEQQLEK	1.000	1	2	3.1	NCBI
KIF1B	kinesin-like protein KIF1B-like, partial	MADTG**S**PGMQR	0.991	1	2	2.6	NCBI
LARP4	la-related protein 4-like	EQFVPPR**S**PK	1.000	1	2	2.5	NCBI
LUZP1	Leucine zipper protein 1	DFKc**S**EDVPTR	1.000	1	2	2.6	NCBI
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	SEQQAEALD**S**PQK	1.000	1	2	4.0	NCBI
LRRC47	Leucine-rich repeat-containing protein 47	E**S**GEGEDEVADSAR	1.000	1	2	3.3	NCBI
KDM5C	lysine-specific demethylase 5C	VQGLLENGDSVT**S**PEK	0.995	1	2	3.5	NCBI
MSL3	male-specific lethal 3 homolog isoform 2	SS**S**PIPLTPSK	0.996	1	2	3.0	NCBI
MAP1A	Microtubule-associated protein 1A	cL**S**PDDSTVK	1.000	1	2	2.4	NCBI
MAP1B	Microtubule-associated protein 1B	GIK**S**PFEGK	1.000	1	2	2.5	NCBI
MAP4	Microtubule-associated protein 4	AAVSVTGNDIT**T**PPNK	0.996	1	2	3.2	NCBI
MAP4	Microtubule-associated protein 4	IG**S**TENIK	0.991	1	2	2.3	NCBI
MAP4	Microtubule-associated protein 4	IG**S**TENLK	0.991	1	2	2.3	NCBI

MPDZ	multiple PDZ domain protein-like isoform 1	GSLPQVS**S**PR	0.993	1	2	2.2	NCBI
MYH9	Myosin-9	GTGDc**S**DEEVDGKADGAEAKPAE	1.000	1	3	4.6	NCBI
PPP1R9B	Neurabin-2	AEAVPEEEAASVA**T**PER	1.000	1	2	2.8	NCBI
NFATC2IP	NFATC2-interacting protein-like	LQDLQAcL**S**PK	1.000	1	2	3.3	NCBI
NFRKB	Nuclear factor related to kappa-B-binding protein	AVSTVVVTTAP**S**PK	1.000	1	2	2.4	NCBI
NUP98	Nuclear pore complex protein Nup98-Nup96	GDTVQEIc**S**PR	1.000	1	2	3.1	NCBI
MDM1	nuclear protein MDM1-like isoform 1	GL**S**PVKEPK	1.000	1	2	2.5	NCBI
NR2C1	nuclear receptor subfamily 2 group C member 1	ALTPGESTAcQ**S**PVEDMK	1.000	1	2	2.4	NCBI
Nr2c2	nuclear receptor subfamily 2 group C member 2	IQIISTDSAVA**S**PQR	1.000	1	2	3.9	NCBI
NOLC1	Nucleolar phosphoprotein p130	VADN**S**FDAKR	1.000	1	2	3.0	NCBI
NOL8	Nucleolar protein 8	FLE**S**D**S**EEEEKELNENK	1.000	2	2	2.5	NCBI
PRRX1	paired mesoderm homeobox protein 1-like, partial	LD**S**PGNLDTLQAK	1.000	1	2	2.5	NCBI
PALMD	Paralemmin	EPAPLNG**S**AAELPDTK	1.000	1	2	2.7	NCBI
PALM	paralemmin-1	SDVMVNSQQTPQG**T**PK	0.995	2	2	3.9	NCBI
PLIN4	perilipin-4-like	GA**S**GLLQPSEQTTAGcK	1.000	1	2	3.4	NCBI
PIK3C2A	phosphatidylinositol-4-phosphate 3-kinase C2 domain-containing subunit alpha	ASVcNLQV**S**PK	1.000	1	2	2.8	NCBI
PPP1R18	Phostensin	EETLSPGIALDQ**S**PVTK	0.992	1	2	2.6	NCBI
PLEKHG3	Pleckstrin-likey domain-containing family G member 3	FSSAAET**S**PR	0.993	1	2	2.3	NCBI
PLEC	Plectin	NDESQL**S**PATR	0.999	1	2	2.8	NCBI
PBX2	Pre-B-cell leukemia transcription factor 2	TAVSVAQGGH**S**R	1.000	1	2	2.5	NCBI
ADRM1	proteasomal ubiquitin receptor ADRM1-like	DKKDEEEDM**S**LD	1.000	1	2	2.7	NCBI
PSMA3	Proteasome subunit alpha type-3	ESLKEEDE**S**DDDNm	1.000	1	2	4.3	NCBI
AHNAK2	Protein AHNAK2	GPPASLEQPEA**S**PISK	0.999	1	2	4.3	NCBI
AJUBA	protein ajuba-like	LETTAPAL**S**PR	1.000	1	2	2.4	NCBI
KNOP1	Protein C16orf88-like	**S**LPQATSQGScLK	1.000	1	2	2.3	NCBI
N/A	protein C9orf140 homolog	SP**S**ADASAAVcK	0.994	1	2	3.5	NCBI
CNPY3	Protein canopy-like 3	ELASLEGDA**S**PEEEEGVQK	1.000	1	2	2.2	NCBI
AHCTF1	Protein ELYS	SVENEQ**S**PNIVR	1.000	1	2	3.0	NCBI
FAM38A	Protein FAM38A	TA**S**ELLLDR	0.992	1	2	2.5	NCBI
HEXIM2	protein HEXIM2-like	EIH**S**EDEGIASAGVGSGcNNR	1.000	1	3	5.3	NCBI
IWS1	Protein IWS1-like	MD**S**DEDEEKEGDEEK	1.000	1	2	4.0	NCBI
IWS1	Protein IWS1-like	VV**S**DADD**S**DSDVISDK	0.995	2	2	3.9	NCBI
KRI1	protein KRI1 homolog	A**S**PQAQLPVPNGAcGK	1.000	1	2	2.7	NCBI
MICAL3	Protein MICAL-3	GR**S**EEELEASK	1.000	1	2	3.4	NCBI
SCRIB	protein scribble homolog, partial	RNEAFIcKPD**S**GPP**S**PSEEEK	0.991	2	3	4.5	NCBI
SCRIB	Protein scribble-like	VLAAVPSAG**S**LQR	1.000	1	2	2.4	NCBI
ECD	protein SGT1 homolog	LPDNADHIPQG**S**Q	1.000	1	2	2.4	NCBI
WIZ	Protein Wiz	APLTLAG**S**PTPK	0.990	1	2	2.3	NCBI

RBM15B	putative RNA-binding protein 15B-like	RN**S**LEGYSR	1.000	1	2	2.2	NCBI
RIN1	Ras and Rab interactor 1	GGGN**S**EGELETTVDQGGGENQAR	1.000	1	3	3.9	NCBI
RPRD1B	regulation of nuclear pre-mRNA domain-containing protein 1B-like	LSMEDSK**S**PPPK	0.995	1	2	2.9	NCBI
ARHGEF17	Rho guanine nucleotide exchange factor 17	SL**S**DPIPQR	0.999	1	2	2.4	NCBI
ARHGEF17	Rho guanine nucleotide exchange factor 17	**S**PGLSGDVTQGQR	1.000	1	2	3.2	NCBI
SASH1	SAM and SH3 domain-containing protein 1	AGG**S**VESLR	1.000	1	2	2.4	NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	RY**S**P**S**PPPK	0.996	2	2	2.3	NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	TA**S**PPPPPK	1.000	1	2	2.3	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	IGAG**S**PPGTR	0.996	1	2	3.1	NCBI
NEK1	Serine/threonine-protein kinase Nek1	Tc**S**LPDLSK	1.000	1	2	2.2	NCBI
CDK14	Serine/threonine-protein kinase PFTAIRE-1	VH**S**ENNAcINFK	1.000	1	2	3.0	NCBI
SRRT	Serrate RNA effector molecule-like	HEL**S**PPQK	1.000	1	2	2.2	NCBI
SKI	Ski oncogene	VVN**S**PPcTTVVSR	1.000	1	2	2.8	NCBI
SLC4A7	sodium bicarbonate cotransporter 3-like	AL**S**MNTENAK	1.000	1	2	2.2	NCBI
SLC9A1	Sodium/hydrogen exchanger 1	LD**S**PTMSR	0.999	1	2	2.2	NCBI
SORBS1	Sorbin and SH3 domain-containing protein 1	SA**T**LPLPAR	1.000	1	2	3.0	NCBI
SCAF1	Splicing factor, arginine/serine-rich 19	AP**S**PAPAM**S**PK	1.000	2	2	2.6	NCBI
SLIRP	SRA stem-loop-interacting RNA-binding protein, mitochondrial-like	AQT**S**DEDRDF	0.998	1	2	2.8	NCBI
STRN3	Striatin-3	NLEQILNGGE**S**PK	1.000	1	2	3.1	NCBI
STIM1	Stromal interaction molecule 1	LTEPQLGLG**S**QR	1.000	1	2	2.5	NCBI
SVIL	Supervillin	EMEK**S**FDEHNVPK	1.000	1	2	2.3	NCBI
SFR1	swi5-dependent recombination DNA repair protein 1 homolog	ScSEFQG**S**LK	1.000	1	2	2.4	NCBI
TBC1D5	TBC1 domain family member 5	SE**S**MPVQLNK	0.997	1	2	2.4	NCBI
RIF1	Telomere-associated protein RIF1	VSENN**S**PDLLSQTEcESK	1.000	1	2	2.8	NCBI
TNIK	Traf2 and NCK-interacting protein kinase	TTSI**S**PALAR	1.000	1	2	2.2	NCBI
SUPT5H	Transcription elongation factor SPT5	VVSISSEHLEPI**T**PTK	0.999	1	2	2.5	NCBI
PURB	Transcriptional activator protein Pur-beta	RGGGSGGGDE**S**EGEEVDED	1.000	1	2	3.9	NCBI
TLE4	Transducin-like enhancer protein 4	DAPI**S**PASVASSSSTPSSK	0.991	1	2	3.6	NCBI
TMCO1	transmembrane and coiled-coil domains protein 1 isoform 1	FG**S**ADNIPNLK	1.000	1	2	2.8	NCBI
TCOF1	Treacle protein	TLPV**T**PPQSTPVQSK	1.000	1	2	2.6	NCBI
TRIM3	tripartite motif-containing protein 3	RED**S**PGPEVQPMDK	1.000	1	3	4.2	NCBI
N/A	Tripartite motif-containing protein 32	EMDMSPEEVVA**S**PR	0.995	1	2	2.4	NCBI
DUS3L	tRNA-dihydrouridine synthase 3-like	TEVAAE**S**PEQQQVPK	1.000	1	2	2.5	NCBI
TP53BP1	Tumor suppressor p53-binding protein 1	LITSEEER**S**PAK	1.000	1	2	2.8	NCBI
TP53BP1	Tumor suppressor p53-binding protein 1	SEGDGENTQIEDTEPL**S**PVTNSK	0.995	1	3	3.8	NCBI
UBN1	ubinuclein-1	Ic**S**DEEEDEEKGGR	1.000	1	2	2.3	NCBI

N/A	uncharacterized protein C10orf47 homolog	LAGNEAL**S**PTSPSK	1.000	1	2	3.1	NCBI
TICRR	Uncharacterized protein C15orf42-like	ENFPVQSNQ**S**PK	0.997	1	2	2.3	NCBI
SOGA1	Uncharacterized protein C20orf117	AP**S**PTTAAGEESSK	0.999	1	2	2.5	NCBI
MTCL1	Uncharacterized protein KIAA0802	EDV**T**PPL**S**PDDLK	1.000	2	2	3.3	NCBI
KIAA0947	Uncharacterized protein KIAA0947	ASGEDELLPVPG**S**PAR	1.000	1	2	3.3	NCBI
WEE1	wee1-like protein kinase-like, partial	LFD**T**PH**T**PK	1.000	2	2	2.4	NCBI
WFS1	wolframin isoform 1	LNATA**S**LEQEK	1.000	1	2	2.8	NCBI
YLPM1	YLP motif-containing protein 1	NKVPG**S**PQDSQDSR	1.000	1	2	3.5	NCBI
ZC3HAV1	zinc finger CCCH-type antiviral protein 1	YLGTQDcAQLSSV**S**PK	1.000	1	2	4.0	NCBI
ZNF438	zinc finger protein 828	KP**S**PSESPEPR	0.993	1	2	2.7	NCBI
ZKSCAN3	zinc finger protein with KRAB and SCAN domains 3	MEDVAPGL**S**PR	1.000	1	2	3.0	NCBI
PSMD11	26S proteasome non-ATPase regulatory subunit 11	AQ**S**LLSTDR	1.000	1	2	2.3	BB
HMGCR	3-hydroxy-3-methylglutaryl-coenzyme A reductase	**S**KINLQDLQGTcTK	1.000	1	3	4.1	BB
ASAP1	Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 1	QDEMDE**S**DDDLDDKPSPIK	1.000	1	2	2.8	BB
RSRC2	Arginine/serine-rich coiled-coil protein 2	EQSDVSI**S**PR	0.999	1	2	2.6	BB
AVEN	Cell death regulator Aven	VEDD**S**DSETHGEENDER	1.000	1	2	3.1	BB
TOP2A	DNA topoisomerase 2-alpha	SENVEG**T**PTENGLELGSLK	0.995	1	2	4.9	BB
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	NQEIDcL**S**PEAQR	1.000	1	2	3.2	BB
MARK3	MAP/microtubule affinity-regulating kinase 3	GIAPA**S**PMLGNASNPNK	1.000	1	2	2.8	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	AE**S**PEVDVNLPK	1.000	1	2	3.0	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	FNF**S**GSK	1.000	1	2	2.4	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	GP**S**VDVEVPDVDLEcPDAK	1.000	1	2	5.3	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	ISMQDVDLSVG**S**cK	1.000	1	2	2.9	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	LQG**S**GVSLASK	1.000	1	2	2.4	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	MP**S**LDISAPK	1.000	1	2	2.7	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	VEVS**T**PEVSVEGPEGK	0.992	1	2	3.0	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	VK**S**DVDVSLPK	1.000	1	2	4.3	BB
SPG7	paraplegin	AAEAISF**S**R	1.000	1	2	2.5	BB
PPP1R2	Protein phosphatase inhibitor 2	TSAA**S**PVVASAEQPR	1.000	1	2	2.9	BB
RFC2	Replication factor C subunit 2	AQEP**S**PVPSK	1.000	1	2	2.6	BB
LEO1	RNA polymerase-associated protein LEO1	KLN**S**DEEGESSGKR	1.000	1	2	2.6	BB
SIPA1L3	Signal-induced proliferation-associated 1-like protein 3	TL**S**DESLcSGR	0.991	1	2	2.7	BB
SF3B1	Splicing factor 3B subunit 1	GGDSIGE**T**PTPGASK	1.000	2	2	2.3	BB
STMN1	Stathmin	RK**S**HEAEVLK	1.000	1	2	2.7	BB
TSC22D3	TSC22 domain family protein 3	QD**S**LEPVLR	1.000	1	2	2.2	BB

Table 4.3.4: List of phosphopeptides identified as unique to Gallium phosphopeptide enrichment of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
TNKS1BP1	182 kDa tankyrase-1-binding protein	WLDDLLA**S**PPPNSGSAR	1.000	1	2	3.7	BB/NCBI
BCLAF1	Bcl-2-associated transcription factor 1	DLFDY**S**PPLHK	0.995	1	2	3.3	BB/NCBI
BCLAF1	Bcl-2-associated transcription factor 1	KAEGEPQEE**S**PLK	1.000	1	2	2.6	BB/NCBI
DNAJC2	DnaJ homolog subfamily C member 2	KEL**S**EG**S**EDEELQLEEFPMLK	1.000	2	2	3.7	BB/NCBI
EEF1D	Elongation factor 1-delta	AATPAEDDEDDDIDLFG**S**DEEEEDK	1.000	1	2	3.6	BB/NCBI
EPS15L1	epidermal growth factor receptor substrate 15-like	LNDPFQPFPGND**S**PK	1.000	1	2	2.9	BB/NCBI
FNBP4	Formin-binding protein 4	ATGGLcLLGAYAD**S**DDDESDVSEK	1.000	1	2	4.0	BB/NCBI
HSP90AA1	Heat shock protein HSP 90-alpha	DKEV**S**DDEAEEK	1.000	1	2	2.2	BB/NCBI
HNRNPU	Heterogeneous nuclear ribonucleoprotein U	AK**S**PQPPVEEEDEHFDDTVVcLDTYNcDLHFK	1.000	1	3	5.3	BB/NCBI
MARK3	MAP/microtubule affinity-regulating kinase 3	LD**T**FcGSPPYAAPELFQGK	1.000	1	2	2.5	BB/NCBI
MYH9	Myosin-9	KGTGDc**S**DEEVDGK	0.997	1	2	2.5	BB/NCBI
NPM1	Nucleophosmin	DELHIVEAEAmNYEG**S**PIK	1.000	1	3	3.9	BB/NCBI
FAM122A	Protein FAM122A	RIDFIPV**S**PAP**S**PTR	1.000	2	2	3.8	BB/NCBI
SEPT2	Septin-2	IYHLPDAE**S**DEDEDFK	1.000	1	2	3.3	BB/NCBI
SRPK1	Serine/threonine-protein kinase SRPK1	GSAPHSESDIPEQEEEILG**S**DDDEQEDPNDYcK	1.000	1	3	4.7	BB/NCBI
VPS4B	Vacuolar protein sorting-associated protein 4B	GND**S**DGEAESDDPEK	1.000	1	2	2.5	BB/NCBI
PRKAR2B	cAMP-dependent protein kinase type II-beta regulatory subunit	RA**S**VcAEAYNPDEEEDDAESR	1.000	1	3	4.0	BB
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	ND**S**WGSFDLR	1.000	1	2	2.3	BB
SF1	Splicing factor 1	R**S**P**S**PEPIYNSEGK	1.000	2	2	2.4	BB
ATXN2L	Ataxin-2-like protein	GPPQ**S**PVFEGVYNNSR	1.000	1	2	3.2	NCBI
RANBP2	E3 SUMO-protein ligase RanBP2	GAEDDEG**S**DEEVVHNEDIHFEPIVSLPEVEVK	1.000	1	3	4.4	NCBI
HSP90B1	Endoplasmin	TETVEEPLEEDEAAKEEKEE**S**DDEAAVEEEEEEK	1.000	1	3	4.7	NCBI
EIF5	Eukaryotic translation initiation factor 5	EAEEE**SS**GGEEEDEDENIEVVYSK	1.000	2	2	2.6	NCBI
ALDOA	Fructose-bisphosphate aldolase A	GILAADESTG**S**IAK	0.999	1	2	2.4	NCBI
GPHN	Gephyrin	EVHDELEDLP**S**PPPPL**S**PPPTT**S**PHK	0.991	3	3	4.1	NCBI
HDAC2	Histone deacetylase 2	IAcDEEF**S**DSEDEGEGGR	0.998	1	2	2.8	NCBI
LRRFIP2	Leucine-rich repeat flightless-interacting protein 2	RG**S**GDTSSLVDPDTSLSELR	1.000	1	2	4.0	NCBI
NFIC	Nuclear factor 1 C-type	NWTEDIEGGIS**S**PVK	0.997	1	2	3.9	NCBI
NAP1L1	Nucleosome assembly protein 1-like 1	LDGLVD**T**PTGYIESLPK	0.997	1	2	4.1	NCBI
PDIA6	Protein disulfide-isomerase A6	DGELPVEDDIDL**S**DVELDDLEK	1.000	1	2	3.9	NCBI
PRKCD	Protein kinase C delta type	Ac**T**FcGTPDYIAPEILQGLK	0.993	1	2	2.7	NCBI

RANBP1	Ran-specific GTPase-activating protein	FA**S**ENDLPEWK	1.000	1	2	3.2	NCBI
SEPT8	Septin-7	IYEFPE**T**DDEEENK	1.000	1	2	2.6	NCBI
SMAP	Small acidic protein	SA**S**PDDDLGSSNWEAADLGNEER	0.990	1	2	6.8	NCBI
SMN1	Survival motor neuron protein	GTGQ**S**DDSDIWDDTALIK	0.999	1	2	2.7	NCBI
TMOD3	Tropomodulin-3	DLDEDELLNNL**S**ETELK	1.000	1	2	4.6	NCBI

Table 4.3.5: List of phosphopeptides identified as common to Titanium dioxide, Iron and Gallium phosphopeptide enrichments of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
TNKS1BP 1	182 kDa tankyrase-1-binding protein	VP**SS**DEEVVEEPQSR	1.000	2	2	4.3	BB/NCBI
RPS3	40S ribosomal protein S3	DEILPT**T**PISEQK	0.996	1	2	2.3	BB/NCBI
XRN2	5'-3' exoribonuclease 2	AED**S**D**S**EPEPEDNVR	1.000	2	2	2.9	BB/NCBI
AKAP12	A-kinase anchor protein 12	GLSEAQQEGEAEEGAT**S**DGEK	0.991	1	2	4.9	BB/NCBI
ATXN2L	Ataxin-2-like protein	EVDGLLTSDPMG**S**PVSSK	1.000	1	2	5.2	BB/NCBI
ACLY	ATP-citrate synthase	AKPAMPQDSVP**S**PR	1.000	1	2	2.3	BB/NCBI
EPB41L2	Band 4.1-like protein 2	EVTENEQNQL**S**EPEEGK	1.000	1	2	3.8	BB/NCBI
EPB41L2	Band 4.1-like protein 2	GSQPGPAVESQS**S**PR	0.993	1	2	2.5	BB/NCBI
BCLAF1	Bcl-2-associated transcription factor 1	IDI**S**PSALR	1.000	1	2	2.5	BB/NCBI
PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	EDEI**S**PPPPNPVVK	1.000	1	2	2.6	BB/NCBI
NCAPG	Condensin complex subunit 3	AIQcEDEEIN**S**DDEQEAK	1.000	1	2	4.2	BB/NCBI
LIG1	DNA ligase 1-like	AAQVL**SS**EGEEEDEAPSTPK	1.000	2	3	3.9	BB/NCBI
DNAJC2	DnaJ homolog subfamily C member 2	NA**S**TSFQELEDK	0.995	1	2	3.5	BB/NCBI
DKC1	H/ACA ribonucleoprotein complex subunit 4	TVLE**S**GGEAGDGD**S**DTTK	0.998	2	2	5.2	BB/NCBI
HSP90AA1	Heat shock protein HSP 90-alpha	ESDDKPEIEDVG**S**DEEEEEK	1.000	1	2	2.2	BB/NCBI
HDGF	Hepatoma-derived growth factor	GNAEG**SS**DEEGKLVIDEPAK	1.000	2	3	4.1	BB/NCBI
KPNA4	importin subunit alpha-3	NVPQEESLED**S**DVDADFK	1.000	1	2	3.5	BB/NCBI
SLC4A1AP	Kanadaptin	MLGED**S**DEEEETDTTEGK	1.000	1	2	5.4	BB/NCBI
LARP1B	La-related protein 1B	LDGPVENV**S**EDEAQSSSQR	1.000	1	2	3.9	BB/NCBI
DBR1	Lariat debranching enzyme	SGETVE**S**GDEKDLSEFPVK	1.000	1	2	3.8	BB/NCBI
LUZP1	Leucine zipper protein 1	EKPD**S**DDDLDIESLVTAK	1.000	1	2	2.7	BB/NCBI
TOMM34	Mitochondrial import receptor subunit TOM34	VP**S**AGDVER	1.000	1	2	2.7	BB/NCBI
MORC2	MORC family CW-type zinc finger protein 2A	SLAV**S**DEEEAEEEAEK	1.000	1	2	3.3	BB/NCBI
NELFE	Negative elongation factor E	SV**S**ADEDLQESSR	0.998	1	2	4.4	BB/NCBI
NPM1	Nucleophosmin	cGSGPVHISGQHLVAVEEDAE**S**EDEDEEDVK	1.000	1	3	4.8	BB/NCBI
OTUD4	OTU domain-containing protein 4	EE**SS**EDENEVSNILK	1.000	2	2	3.5	BB/NCBI
PALLD	Palladin	SRD**S**GDENEPIQER	0.994	1	2	3.5	BB/NCBI
PI4KB	Phosphatidylinositol 4-kinase beta	**S**VENLPEcGITHEQR	1.000	1	2	2.8	BB/NCBI
DEK	protein DEK-like	DE**S**EEEEDDDEDEDEEEEKEK	1.000	1	2	3.3	BB/NCBI
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	DVEDMEL**S**DVEDDGSK	1.000	1	2	4.2	BB/NCBI
RSF1	Remodeling and spacing factor 1	IE**S**DEEEDFENVGK	1.000	1	2	5.0	BB/NCBI

RRM2	Ribonucleoside-diphosphate reductase subunit M2	VPLATITDQQQLQV**S**PLK	1.000	1	2	4.6	BB/NCBI
SEPT9	Septin-9	**S**FEVEEIEPPNSTPPR	1.000	1	2	4.4	BB/NCBI
SPTBN1	spectrin beta chain, brain 1 isoform 1	GDQVSQNGLPAEQG**S**PR	1.000	1	2	5.1	BB/NCBI
SMARCC2	SWI/SNF complex subunit SMARCC2	DMDEP**S**PVPNVEEVTLPK	1.000	1	2	3.5	BB/NCBI
N/A	uncharacterized protein C6orf203 homolog	DADEED**S**DEETHLPER	1.000	1	2	3.5	BB/NCBI
C1orf52	UPF0690 protein C1orf52 homolog	LLPEGEETVE**S**DDDKDER	1.000	1	2	3.8	BB/NCBI
VWA5A	von Willebrand factor A domain-containing protein 5A	AYVSLD**S**MEDEESESK	1.000	1	2	4.9	BB/NCBI
DPF2	Zinc finger protein ubi-d4	VDDD**S**LGEFPVTNSR	1.000	1	2	3.7	BB/NCBI
PDAP1	28 kDa heat- and acid-stable phosphoprotein	SLD**S**DE**S**EDEDDDYQQK	0.995	2	2	5.8	BB
ABCF1	ATP-binding cassette sub-family F member 1	FAALD**S**EEEDDEETTEEK	1.000	1	2	4.8	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	ASLG**S**LEGEADAEASSPK	1.000	2	2	5.5	BB
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	EVEDKE**S**EGEDEDEDEDLSK	1.000	1	2	2.8	BB
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	YNLDA**S**EEEDSNK	1.000	1	2	4.9	BB
EIF4B	Eukaryotic translation initiation factor 4B	YAAL**S**VDGEDENEGDDHAE	1.000	1	2	3.9	NCBI
HSP90AB1	heat shock protein HSP 90-beta-like	IEDVG**S**DEEDDSGK	1.000	1	2	4.0	NCBI
HDGFRP2	Hepatoma-derived growth factor-related protein 2	GG**SS**GEELEDNEPVK	1.000	2	2	5.2	NCBI
NOLC1	Nucleolar phosphoprotein p130	AGKE**S**EEDEEEEETK	1.000	1	3	4.3	NCBI
RIF1	Telomere-associated protein RIF1	VTAE**S**PIQENLTEK	1.000	1	2	3.5	NCBI
TCOF1	Treacle protein	KL**S**GDQLAAGAPESK	1.000	1	2	4.7	NCBI
ZFR	Zinc finger RNA-binding protein	RD**S**DGVDGFEAEGK	1.000	1	2	3.6	NCBI

Table 4.3.6: List of phosphopeptides identified as common to Titanium dioxide and Iron phosphopeptide enrichments of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
TNKS1BP1	182 kDa tankyrase-1-binding protein	DTGQLEEGESGGLL**S**PSmPK	0.999	1	2	2.96	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	RD**S**LLDIR	1.000	1	2	2.78	BB/NCBI
TNKS1BP1	182 kDa tankyrase-1-binding protein	TEAQDPcRV**S**PEPTGPER	1.000	1	3	4.12	BB/NCBI
PSMD9	26S proteasome non-ATPase regulatory subunit 9-like	LGSN**S**PVLPQAFAK	1.000	1	2	3.81	BB/NCBI
RPS27	40S ribosomal protein S27	DLLHP**S**PEEEK	1.000	1	2	3.00	BB/NCBI
RPL12	60S ribosomal protein L12	IGPLGL**S**PK	1.000	1	2	2.99	BB/NCBI
RPL14	60S ribosomal protein L14	AAILKA**S**PK	1.000	1	2	2.23	BB/NCBI
RPL4	60S ribosomal protein L4	ILK**S**PEIQR	1.000	1	2	2.28	BB/NCBI
AHSA2	Activator of 90 kDa heat shock protein ATPase-like 2	VTGNPLQA**S**PVALGVR	1.000	1	2	3.50	BB/NCBI
ARL6IP4	ADP-ribosylation factor-like protein 6-interacting protein 4	**S**AGEDDGPVLTDEQK	1.000	1	2	3.60	BB/NCBI
MLLT4	Afadin	TI**S**NPEVVMK	1.000	1	2	2.57	BB/NCBI
MLLT4	Afadin	TS**S**VVTLEVAK	0.993	1	2	3.87	BB/NCBI
AKAP1	A-kinase anchor protein 1, mitochondrial-like	LPKPD**S**LQNVQASSNPK	1.000	1	3	4.16	BB/NCBI
AMPD2	AMP deaminase 2	TD**S**DSDLQLYK	0.995	1	2	3.75	BB/NCBI
ANKRD17	ankyrin repeat domain-containing protein 17-like	AP**S**PASSSVPLGSEKPSNVSQDR	1.000	1	3	4.13	BB/NCBI
AP3B1	AP-3 complex subunit beta-1	NFYE**S**DDEEKEK	0.997	1	2	2.37	BB/NCBI
AP3D1	AP-3 complex subunit delta-1 isoform 1	HSSLP**T**E**S**DEDIAPAQR	1.000	2	2	2.90	BB/NCBI
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	GL**S**PLSSTLDTK	1.000	1	2	2.36	BB/NCBI
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SQ**S**PSPPSLSEDLEK	0.991	2	2	2.56	BB/NCBI
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SSFSEEKGE**S**DDEKPR	1.000	1	2	2.75	BB/NCBI
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	TAQVP**S**PPR	1.000	1	2	2.21	BB/NCBI
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	LLHEDLDE**S**DDDVDEK	1.000	1	2	4.62	BB/NCBI
RERE	Arginine-glutamic acid dipeptide repeats protein	TQEISRPN**S**PSEGEGESSDSR	0.990	2	3	4.61	BB/NCBI
PEA15	astrocytic phosphoprotein PEA-15	DIIRQP**S**EEEIIK	1.000	1	2	2.24	BB/NCBI
ABCF1	ATP-binding cassette sub-family F member 1-like	AV**S**EEQQPGLR	1.000	1	2	2.80	BB/NCBI
DDX18	ATP-dependent RNA helicase DDX18	KLPQKPTTLTNGETAATP**S**PDSEPK	1.000	1	3	4.44	BB/NCBI
DDX54	ATP-dependent RNA helicase DDX54	IDDRD**S**EDEGSFNQR	1.000	1	3	5.05	BB/NCBI

ARID1A	AT-rich interactive domain-containing protein 1A	TLLDPGRF**S**K	1.000	1	2	2.24	BB/NCBI
ATN1	Atrophin-1	SEEV**S**ESESEETSAPK	0.999	1	2	3.83	BB/NCBI
BCL6B	B-cell CLL/lymphoma 6 member B protein	VYEDSGVPLPTE**S**PK	1.000	1	2	2.49	BB/NCBI
BCLAF1	bcl-2-associated transcription factor 1	AEGEPQEE**S**PLK	1.000	1	2	3.21	BB/NCBI
BET1	BET1 homolog	SL**S**IEIGHEVK	1.000	1	2	2.84	BB/NCBI
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	RG**S**ISQEITK	1.000	1	2	2.75	BB/NCBI
CDCA8	borealin-like	EQIYNVSING**S**PLADSK	1.000	1	2	4.86	BB/NCBI
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SI**S**TVDLTEK	0.990	1	2	2.70	BB/NCBI
BRCA1	Breast cancer type 1 susceptibility protein-like	RA**S**DPFPEEK	1.000	1	2	2.73	BB/NCBI
BUD13	BUD13-like	HD**S**PDLELPR	1.000	1	2	2.21	BB/NCBI
CAD	CAD protein isoform 1	A**S**DPGLPAEEPK	1.000	1	2	2.21	BB/NCBI
CAT	Catalase	**S**LQKPDVLTTGGGNPIGDK	1.000	1	2	2.23	BB/NCBI
CEBPZ	CCAAT/enhancer-binding protein zeta	NEDED**S**IEDVDDKEFEK	1.000	1	2	5.15	BB/NCBI
CD44	CD44 antigen	**S**QEMVHLVNK	1.000	1	2	2.48	BB/NCBI
CDC42EP2	cdc42 effector protein 2-like	LHLE**S**PQP**S**PK	1.000	2	2	3.32	BB/NCBI
N/A	Cell division cycle 2-related protein kinase 7	NS**S**PAPPQPAPVK	0.996	1	2	2.49	BB/NCBI
CEP170	Centrosomal protein of 170 kDa	LGEA**S**DSELADADK	1.000	1	2	4.98	BB/NCBI
CBX5	chromobox protein homolog 5	KS**S**FSNSADDIK	0.997	1	2	4.33	BB/NCBI
CDYL	chromodomain Y-like protein-like	ILVPK**S**PVK	1.000	1	2	2.33	BB/NCBI
CCDC86	coiled-coil domain-containing protein 86-like	VQPLET**S**PG**S**PcLK	0.992	2	2	2.22	BB/NCBI
CSDE1	cold shock domain-containing protein E1-like, partial	NI**S**LDDASAPR	1.000	1	2	3.03	BB/NCBI
NCAPD3	Condensin-2 complex subunit D3	SLGALPFSVESG**S**PEK	1.000	1	2	3.21	BB/NCBI
COBLL1	Cordon-bleu protein-like 1	EQTA**S**APATPLVSK	1.000	1	2	2.26	BB/NCBI
CTTNBP2NL	CTTNBP2 N-terminal-like protein	DL**S**PTLLDNSAAK	0.995	1	2	2.71	BB/NCBI
ATF2	cyclic AMP-dependent transcription factor ATF-2 isoform 1	NDSVIVADQ**T**P**T**PTR	0.999	2	2	3.28	BB/NCBI
N/A	cyclin-dependent kinase 11-like isoform 1	RD**S**LEEGELR	1.000	1	2	2.37	BB/NCBI
CDK16	cyclin-dependent kinase 16	RV**S**LSEIGFGK	0.993	1	2	2.36	BB/NCBI
CDK17	cyclin-dependent kinase 17	RI**S**mEDLNK	1.000	1	2	2.60	BB/NCBI
CCNK	Cyclin-K	TVVV**S**PKEENK	1.000	1	2	3.66	BB/NCBI
CCNL1	Cyclin-L1	AEEK**S**PISINVK	0.999	1	2	3.02	BB/NCBI
CCNL2	Cyclin-L2	TD**S**PVNGLPK	1.000	1	2	2.49	BB/NCBI
DYNC1LI1	Cytoplasmic dynein 1 light intermediate chain 1	KPASV**S**PTTPTSPTEGEAS	0.995	1	2	2.76	BB/NCBI
PLA2G4A	cytosolic phospholipase A2-like	HIVSNDSSD**S**DDEAQAPK	0.999	1	2	4.30	BB/NCBI
DCAF8	DDB1- and CUL4-associated factor 8-like	VHDH**S**EEEEEEQPLHR	1.000	1	3	4.19	BB/NCBI
DOCK1	Dedicator of cytokinesis protein 1	**S**QVINVIGSER	1.000	1	2	2.53	BB/NCBI
DAB2	Disabled-like 2	**S**ADNSLENPFSK	1.000	1	2	3.70	BB/NCBI

DNMT1	DNA (cytosine-5)-methyltransferase 1	EADDDEEVDDDIPEVP**S**PK	1.000	1	2	3.06	BB/NCBI
DNMT1	DNA (cytosine-5)-methyltransferase 1	EAESEQMTLE**S**AEDG**S**EEEEREEK	1.000	2	3	4.79	BB/NCBI
LIG3	DNA ligase 3 isoform 2	VTTTGQVS**S**PVK	1.000	1	2	3.43	BB/NCBI
MCM2	DNA replication licensing factor MCM2	GLLYD**S**DEEDEERPAR	1.000	1	2	3.57	BB/NCBI
MCM2	DNA replication licensing factor MCM2	ISDPLT**SS**PGR	0.995	2	2	2.73	BB/NCBI
MCM3	DNA replication licensing factor MCM3	KP**S**EDE**S**DLEDEEEK	1.000	1	2	3.02	BB/NCBI
TOPBP1	DNA topoisomerase 2-binding protein 1	NTSTLSA**S**PQLK	1.000	1	2	2.56	BB/NCBI
DBNL	drebrin-like protein isoform 1	QL**T**QPEVSYGR	1.000	1	2	2.34	BB/NCBI
DNM1L	dynamin-1-like protein-like	SKPIPIMPA**S**PQK	1.000	1	2	3.02	BB/NCBI
RNF20	E3 ubiquitin-protein ligase BRE1A	ALVVPEPEPDSD**S**NQER	0.997	1	2	3.57	BB/NCBI
NEDD4	E3 ubiquitin-protein ligase NEDD4	QI**S**EEVDSADNR	1.000	1	2	3.00	BB/NCBI
TOPORS	E3 ubiquitin-protein ligase Topors	LQQNVPADA**S**PDSK	1.000	1	2	2.47	BB/NCBI
EFS	Embryonal Fyn-associated substrate	LP**S**TESLSR	0.992	1	2	2.70	BB/NCBI
EPS15L1	epidermal growth factor receptor substrate 15-like	LD**S**SDPFK	0.996	1	2	2.48	BB/NCBI
ESF1	ESF1-like	DSL**SS**EEEADLEK	1.000	2	2	4.60	BB/NCBI
EIF3A	eukaryotic translation initiation factor 3 subunit A-like	LE**S**LNIQR	1.000	1	2	2.76	BB/NCBI
EIF3C	Eukaryotic translation initiation factor 3 subunit C	RPLLL**S**EDEEDTK	1.000	1	2	2.99	BB/NCBI
EIF4G2	eukaryotic translation initiation factor 4 gamma 2-like	TQ**T**PPLGQTPQLGLK	0.992	1	2	3.00	BB/NCBI
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PVAATVVQR	1.000	1	2	3.87	BB/NCBI
FBXO28	F-box only protein 28	EVMESAVGTSSGSGQSEE**S**PR	1.000	1	2	3.72	BB/NCBI
FOXK2	Forkhead box protein K2	EG**S**PAPVEPEPGAAQPK	1.000	1	2	3.47	BB/NCBI
FNBP4	Formin-binding protein 4	ALEEGDGSVSGS**S**PR	0.996	1	2	4.28	BB/NCBI
FNBP4	Formin-binding protein 4	VDEN**S**DKEAEVEESSEK	1.000	1	3	4.80	BB/NCBI
AP1AR	Gamma1-adaptin brefeldin A resistance protein	SK**T**EEDILR	0.993	1	2	2.44	BB/NCBI
GCFC2	GC-rich sequence DNA-binding factor-like isoform 1	EGQNIDL**S**PK	1.000	1	2	2.76	BB/NCBI
GTF3C4	general transcription factor 3C polypeptide 4	ILLVD**S**PGMGDGEDEQQEEGTSK	1.000	1	2	2.66	BB/NCBI
GPN1	GPN-loop GTPase 1	GTLDEEDEEAE**S**DTDDIDHR	0.999	1	3	4.08	BB/NCBI
GAPVD1	GTPase-activating protein and VPS9 domain-containing protein 1	SR**S**SDIVSSVR	0.997	1	2	3.12	BB/NCBI
HSPA4	Heat shock 70 kDa protein 4	HAEQNGPVDGQGD**S**PGPQAAEQGADTAVPSDADK	1.000	1	3	4.99	BB/NCBI
MET	Hepatocyte growth factor receptor	DLG**S**ELVR	1.000	1	2	2.47	BB/NCBI
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	QADL**S**FSSPVEMK	1.000	1	2	2.76	BB/NCBI
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 5	MESEAGADD**S**AEEGDLLDDDDNEDR	1.000	1	3	4.90	BB/NCBI

HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	HTGPN**S**PDTANDGFVR	1.000	1	2	2.53	BB/NCBI
Q13547	histone deacetylase 1-like	IAcEEEF**S**D**S**DEEGEGGRK	1.000	2	3	3.89	BB/NCBI
H3F3A	Histone H3.3	DSTVPVESD**T**DDEGAPR	0.994	1	2	2.89	BB/NCBI
Htatsf1	HIV Tat-specific factor 1-like	LYEDD**S**DKELEENGVK	1.000	1	2	3.84	BB/NCBI
N/A	hypothetical protein I79_019528	DTGGPAEGVEALAM**S**PQQPQR	1.000	1	3	4.46	BB/NCBI
N/A	hypothetical protein LOC100773692	DIKEE**S**DEEDDDDEESGR	1.000	1	3	5.07	BB/NCBI
KPNA2	importin subunit alpha-2	NVSSFPDDAT**S**PLQENR	0.994	1	2	3.13	BB/NCBI
RHBDF2	inactive rhomboid protein 2	SV**S**LQEPR	0.996	1	2	2.35	BB/NCBI
IRF2BPL	interferon regulatory factor 2-binding protein-like	NSS**S**PV**S**PASVPGQR	0.992	2	2	2.58	BB/NCBI
KLC2	kinesin light chain 2-like	AS**S**LNFLNK	0.995	1	2	2.79	BB/NCBI
NUF2	kinetochore protein Nuf2-like	IVD**S**PEKVK	1.000	1	2	2.78	BB/NCBI
LARP4	la-related protein 4-like	SSSGSEHSTEGSVSLGDGPL**S**R	1.000	1	3	4.50	BB/NCBI
BAG6	Large proline-rich protein BAT3	ENA**S**PAPGTTAEEAMSR	1.000	1	2	3.63	BB/NCBI
LUZP1	Leucine zipper protein 1	**S**QENIPQGFSVPNK	1.000	1	2	3.12	BB/NCBI
LRRC16A	Leucine-rich repeat-containing protein 16A	RS**S**GLISELPSEEGK	0.999	1	2	3.73	BB/NCBI
LIMA1	LIM domain and actin-binding protein 1	SEAQQPVHTKPL**S**PDAR	0.996	1	2	2.22	BB/NCBI
LMO7	LIM domain only protein 7	SR**S**TTELNDAATEK	0.991	1	2	4.01	BB/NCBI
MELK	maternal embryonic leucine zipper kinase isoform 1	GTNVFG**S**LER	1.000	1	2	2.77	BB/NCBI
MELK	maternal embryonic leucine zipper kinase isoform 1	**S**MEVDLNQAHMEDTPK	1.000	1	2	2.29	BB/NCBI
MED1	mediator of RNA polymerase II transcription subunit 1	SQ**T**PPGVATPPIPK	1.000	1	2	2.52	BB/NCBI
MTA1	Metastasis-associated protein MTA1	LPEASQ**S**PLVLK	0.994	1	2	2.95	BB/NCBI
MECP2	Methyl-CpG-binding protein 2	AETSESSGSAPAVPEASA**S**PK	1.000	1	2	4.27	BB/NCBI
MAP1B	Microtubule-associated protein 1B	AQSLEGEKL**S**PK	1.000	1	2	3.34	BB/NCBI
MAP1B	Microtubule-associated protein 1B	SPSLSPSPP**S**PIEK	0.999	1	2	3.58	BB/NCBI
MCMBP	mini-chromosome maintenance complex-binding protein-like	VH**S**PPASLVPR	1.000	1	2	2.20	BB/NCBI
MAPK6	mitogen-activated protein kinase 6	GHL**S**EGLVTK	1.000	1	2	2.87	BB/NCBI
MAP3K7	mitogen-activated protein kinase kinase kinase 7-like	**S**IQDLTVTGTEPGQVSSR	1.000	1	2	4.35	BB/NCBI
MAP3K5	mitogen-activated protein kinase kinase kinase kinase 5-like, partial	TA**S**EINFDK	0.996	1	2	2.27	BB/NCBI
MVB12A	multivesicular body subunit 12A-like	GL**S**LDPPTQPSK	1.000	1	2	2.84	BB/NCBI
MYBBP1A	Myb-binding protein 1A	LSQVNGG**T**PV**S**PIEPEGK	1.000	2	2	4.02	BB/NCBI
MYBBP1A	Myb-binding protein 1A	SP**S**LLQSVVK	1.000	1	2	3.04	BB/NCBI
BIN1	Myc box-dependent-interacting protein 1	VNHEPEPASGA**S**PGATIPK	1.000	1	3	4.57	BB/NCBI
MYH10	myosin-10	QLHIEGA**S**LEL**S**DDDTESK	1.000	2	3	4.14	BB/NCBI
MYO18A	Myosin-XVIIIa	SLAPDP**S**DDENGPVDSTSRPR	1.000	1	2	2.33	BB/NCBI

NGDN	neuroguidin-like	LN**S**EDEEEDEAEEDQSEAAGK	1.000	1	2	5.58	BB/NCBI
SLC1A5	Neutral amino acid transporter B(0)	TPS**S**EPELIQVK	0.995	1	2	2.51	BB/NCBI
NAB2	NGFI-A-binding protein 2 isoform 1	SF**S**PK**S**PLELGEK	0.995	2	2	2.71	BB/NCBI
NIPBL	nipped-B-like protein	AITSLLGGG**S**PK	1.000	1	2	2.85	BB/NCBI
NASP	nuclear autoantigenic sperm protein-like	AALEQLSGQDVKV**S**PK	1.000	1	2	3.68	BB/NCBI
NASP	nuclear autoantigenic sperm protein-like	SLSKPE**T**DTEQESEVEK	1.000	1	2	3.73	BB/NCBI
NFIC	Nuclear factor 1 C-type	SPFNSP**S**PQDSPR	1.000	2	2	2.55	BB/NCBI
NUFIP2	nuclear fragile X mental retardation-interacting protein 2-like, partial	SL**S**SDEATNPISR	0.991	1	2	3.67	BB/NCBI
NUDC	Nuclear migration protein nudC	NGSLD**S**PGKQDAEEEEEEDEKDK	1.000	1	3	4.35	BB/NCBI
NUP88	Nuclear pore complex protein Nup88	EDAEVAE**S**PLR	1.000	1	2	3.05	BB/NCBI
NRBP2	nuclear receptor binding protein	TP**T**PEPAEVETR	0.995	1	2	3.30	BB/NCBI
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	TPSPKEEDEEAE**S**PPEKK	1.000	1	3	4.10	BB/NCBI
N/A	nuclease domain-containing protein 1	AA**S**PATETVPAFSER	0.997	1	2	2.32	BB/NCBI
NOP14	nucleolar protein 14	FGEYNSNI**S**PEEK	0.992	1	2	2.61	BB/NCBI
NOP14	nucleolar protein 14	HNDIVD**S**DNDTEER	1.000	1	2	5.06	BB/NCBI
NOP56	Nucleolar protein 56	EELP**S**DSEEVATcSVSVPK	0.992	1	2	3.66	BB/NCBI
NOP56	Nucleolar protein 56	EEmV**S**DPEEAA**S**PIIPK	1.000	2	2	4.67	BB/NCBI
DDX21	Nucleolar RNA helicase 2	IEEP**S**EEDADVPKPR	1.000	1	2	2.71	BB/NCBI
NPM1	Nucleophosmin	GPS**S**VEDIK	0.995	1	2	2.72	BB/NCBI
NDC1	nucleoporin NDC1-like	KLN**S**PEETTFQTPK	1.000	1	2	2.59	BB/NCBI
NME2	nucleoside diphosphate kinase B-like	NIIHG**S**DSVQSAEK	1.000	1	2	3.54	BB/NCBI
OTUD4	OTU domain-containing protein 4	TP**S**QIIR	1.000	1	2	2.57	BB/NCBI
PSIP1	PC4 and SFRS1-interacting protein	QVETEESGMVAAATASSNLKA**S**PK	1.000	1	2	3.01	BB/NCBI
PCM1	Pericentriolar material 1 protein	NVR**S**DV**S**DQEEDEESER	1.000	2	3	3.84	BB/NCBI
PCNP	PEST proteolytic signal-containing nuclear protein	DTPTSAGPN**S**FNK	1.000	1	2	2.50	BB/NCBI
FARSA	phenylalanyl-tRNA synthetase alpha chain-like	LDTEPR**S**PQTQEAA	1.000	1	2	2.24	BB/NCBI
ATP2B1	Plasma membrane calcium-transporting ATPase 1	IED**S**EPHIPLIDDTDAEDDAPTK	1.000	1	3	6.31	BB/NCBI
FIP1L1	pre-mRNA 3'-end-processing factor FIP1-like	DH**S**PTPSVFNSDEER	1.000	1	2	3.76	BB/NCBI
ZDHHC5	probable palmitoyltransferase ZDHHC5	GD**S**LKEPTSIADSSR	1.000	1	2	2.57	BB/NCBI
AKT1S1	proline-rich AKT1 substrate 1-like	LN**T**SDFQK	0.998	1	2	2.60	BB/NCBI
AATF	protein AATF-like	TESEEI**SS**EDDEPVAEK	1.000	2	2	3.60	BB/NCBI
CASC3	Protein CASC3	GTVTGERQ**S**GDGQESTEPVENK	1.000	1	3	5.05	BB/NCBI
AHCTF1	protein ELYS	TTPLASPSL**S**PGR	0.994	1	2	2.43	BB/NCBI
STRIP1	Protein FAM40A	AA**S**PPASASDLIEQQQK	1.000	1	2	4.18	BB/NCBI
HIRA	Protein HIRA	GVEPSP**S**PIKPGDIK	0.992	1	2	2.43	BB/NCBI
PRKCD	Protein kinase C delta type	LLAEALNQV**S**QR	1.000	1	2	2.71	BB/NCBI

ZMYND8	Protein kinase C-binding protein 1	ELSESVQQQSAPVPLI**S**PK	1.000	1	2	3.28	BB/NCBI
ERBB2IP	Protein LAP2	LLQNGDILNN**S**PEEK	1.000	1	2	3.50	BB/NCBI
LSM12	protein LSM12 homolog	TE**T**PPPLASLNVSK	1.000	1	2	2.78	BB/NCBI
PATL1	Protein PAT1-like 1	ST**S**PVIGSPPVR	0.993	1	2	2.90	BB/NCBI
PPM1G	Protein phosphatase 1G	KLEEAL**S**VEGAEENGNSDK	1.000	1	3	5.51	BB/NCBI
PPP1R2	Protein phosphatase inhibitor 2	EHE**SS**GEEDNDLSPEER	1.000	2	2	2.43	BB/NCBI
RER1	protein RER1-like	VDPSLMED**S**DDGPSLPTK	1.000	1	2	3.14	BB/NCBI
SON	Protein SON	ESEQTAAVGL**S**PK	1.000	1	2	2.41	BB/NCBI
PCDH7	Protocadherin-7	SVNGGPG**S**PDLAR	1.000	1	2	2.27	BB/NCBI
GULP1	PTB domain-containing engulfment adapter protein 1-like, partial	ITQVSS**S**PAGSVTAK	0.990	1	2	3.72	BB/NCBI
PUM1	pumilio homolog 1 isoform 1	RD**S**LTGSSDLYK	1.000	1	2	3.21	BB/NCBI
PUM2	Pumilio-like 2	GKA**S**PFEEDQNR	1.000	1	2	3.09	BB/NCBI
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	DDSLDL**S**PQGR	1.000	1	2	3.10	BB/NCBI
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	HLAESESLLT**S**PPK	0.994	1	2	3.68	BB/NCBI
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	SE**S**PPAELPSLR	1.000	1	2	2.57	BB/NCBI
NOP2	putative ribosomal RNA methyltransferase NOP2	GVDSETPVVPSPSEI**S**PGLK	1.000	1	2	4.36	BB/NCBI
PDXDC1	pyridoxal-dependent decarboxylase domain-containing protein 1	VQGTGV**T**PPPTPSGTR	0.999	1	2	2.70	BB/NCBI
RAPGEF1	Rap guanine nucleotide exchange factor 1	**S**DEQLSSLDR	1.000	1	2	2.44	BB/NCBI
RIN2	Ras and Rab interactor 2	QA**S**FLEAEGSAK	1.000	1	2	3.38	BB/NCBI
N/A	Ras-associated and pleckstrin-likey domains-containing protein 1	TA**S**AGTVSDAEVR	0.993	1	2	3.67	BB/NCBI
REEP4	receptor expression-enhancing protein 4-like	SF**S**MQDLR	0.991	1	2	2.27	BB/NCBI
RPTOR	Regulatory-associated protein of mTOR	ILDTSSLTQSAPA**S**PTNK	0.998	1	2	2.87	BB/NCBI
RBBP6	Retinoblastoma-binding protein 6	VEGAEIVKP**S**PK	1.000	1	2	2.63	BB/NCBI
ARHGEF5	rho guanine nucleotide exchange factor 5-like	LDSLAEAPGLS**S**PR	0.993	1	2	3.22	BB/NCBI
ARHGEF6	Rho guanine nucleotide exchange factor 6	KA**S**EEEYVIR	1.000	1	2	2.79	BB/NCBI
ARHGEF6	Rho guanine nucleotide exchange factor 6	KD**S**VPQLLLPEEEK	1.000	1	2	2.26	BB/NCBI
ARHGEF6	Rho guanine nucleotide exchange factor 6	m**S**GFIYQGK	1.000	1	2	2.66	BB/NCBI
RPS6KA3	ribosomal protein S6 kinase alpha-3	NQ**S**PVLEPVGR	1.000	1	2	2.39	BB/NCBI
RBM25	RNA-binding protein 25	LGASN**S**PGQPNSVK	1.000	1	2	2.96	BB/NCBI
RALY	RNA-binding protein Raly-like	GRL**S**PVPVPR	1.000	1	2	2.21	BB/NCBI
SLTM	SAFB-like transcription modulator	**S**PGHMVILNQTK	1.000	1	2	2.26	BB/NCBI
ATP2A2	Sarcoplasmic/endoplasmic reticulum calcium ATPase 2	EFDELSP**S**AQR	1.000	1	2	2.58	BB/NCBI
SCFD1	Sec1 family domain-containing protein 1	VNLEESAGVEN**S**PAGARPK	1.000	1	2	3.10	BB/NCBI
SEPT8	septin-7	ILEQQNSSR**T**LEK	0.999	1	2	3.45	BB/NCBI
SEPT9	septin-9	ATVASS**S**QKFQDLGVK	0.995	1	2	3.45	BB/NCBI
SQSTM1	Sequestosome-1	LTPT**S**PESSSMDTEDK	0.991	1	2	2.42	BB/NCBI

SRRM1	Serine/arginine repetitive matrix protein 1	APKPEPVPEPKEP**S**PEK	1.000	1	3	4.01	BB/NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	KE**T**E**S**EAEDNLDDLER	1.000	2	2	4.96	BB/NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	RL**S**P**S**A**S**PPR	1.000	3	2	2.22	BB/NCBI
SRSF6	serine/arginine-rich splicing factor 6-like	SH**S**PLPAPPSK	1.000	1	2	2.76	BB/NCBI
STK10	Serine/threonine-protein kinase 10	ANQ**S**RPN**S**VALETLGGEK	1.000	2	2	2.79	BB/NCBI
PRKD1	Serine/threonine-protein kinase D1	SP**S**ESFIGR	0.999	1	2	2.69	BB/NCBI
MARK2	Serine/threonine-protein kinase MARK2	SRN**S**PLLDR	1.000	1	2	3.02	BB/NCBI
MARK2	Serine/threonine-protein kinase MARK2	VPA**S**PLPGVER	1.000	1	2	3.23	BB/NCBI
PAK2	serine/threonine-protein kinase PAK 2-like	YL**S**FTPPEK	0.996	1	2	2.63	BB/NCBI
TAOK3	serine/threonine-protein kinase TAO3	NGPLNE**S**QEEEEDNEHGSNLNR	1.000	1	3	4.53	BB/NCBI
PPP4R2	serine/threonine-protein phosphatase 4 regulatory subunit 2-like	AHSDSPASEPEVSSL**S**PVK	1.000	1	2	5.20	BB/NCBI
SH3BP1	SH3 domain-binding protein 1	TESDLPKPA**S**PK	1.000	1	2	2.80	BB/NCBI
SIPA1L1	Signal-induced proliferation-associated 1-like protein 1	LIDLE**S**PTPESQK	1.000	1	2	3.47	BB/NCBI
SSBP3	Single-stranded DNA-binding protein 3	N**S**PNNISGISNPPGTPR	1.000	1	2	3.39	BB/NCBI
PDS5A	Sister chromatid cohesion protein PDS5-like A	AAGSQE**S**PGGLEASNAK	1.000	1	2	3.86	BB/NCBI
SNW1	SNW domain-containing protein 1-like	GPP**S**PPAPVMH**S**PSR	0.996	2	2	2.83	BB/NCBI
SCNM1	sodium channel modifier 1-like isoform 1	ESSDLLASAPI**S**PTK	0.991	1	2	2.77	BB/NCBI
UTP3	something about silencing protein 10-like	KKEEN**S**AEEEALEEQNAK	1.000	1	3	4.87	BB/NCBI
SORT1	Sortilin	IT**S**PLMEPSSIEK	0.999	1	2	2.39	BB/NCBI
Ssfa2	sperm-specific antigen 2 homolog	TPLGA**S**LDEQSSGALK	1.000	1	2	3.75	BB/NCBI
SSFA2	Sperm-specific antigen 2-like	SQ**S**LPTTLLSPVR	0.996	1	2	2.41	BB/NCBI
SRSF11	Splicing factor, arginine/serine-rich 11	LNHVAAGLV**S**PSLK	1.000	1	2	3.53	BB/NCBI
SFSWAP	splicing factor, suppressor of white-apricot homolog	GV**S**QEKDGQISSAIVSSVQSK	1.000	1	3	4.28	BB/NCBI
SFSWAP	splicing factor, suppressor of white-apricot homolog	VKLDDD**S**EEDEESR	1.000	1	2	4.02	BB/NCBI
SART3	Squamous cell carcinoma antigen recognized by T-cells 3	cVTIDVA**S**PSK	0.993	1	2	2.55	BB/NCBI
STIM1	Stromal interaction molecule 1	AEQ**S**LHDLQER	1.000	1	2	3.18	BB/NCBI
PPAN	Suppressor of SWI4 1-like	TDGD**S**DAEDPGAPLEAVGAGR	0.999	1	2	3.68	BB/NCBI
SMARCC1	SWI/SNF complex subunit SMARCC1-like	KH**S**P**S**PPPPTPTESR	1.000	2	3	4.04	BB/NCBI
SNAP23	synaptosomal-associated protein 23-like isoform 1	ATWGDGGDN**S**PSNVVcK	0.999	1	2	3.52	BB/NCBI
STX4	syntaxin-4-like	AIEPQKEEADENYN**S**VNTR	0.999	1	3	4.28	BB/NCBI
TPX2	targeting protein for Xklp2	SSELPLTVPV**S**PK	1.000	1	2	2.33	BB/NCBI
TMF1	TATA element modulatory factor	SVSEIN**S**DDELPGK	1.000	1	2	2.94	BB/NCBI
TBC1D1	TBC1 domain family member 1	SF**S**QPGLR	1.000	1	2	2.48	BB/NCBI
TBC1D2B	TBC1 domain family member 2B	DTSPDKGELV**S**DEEEDT	1.000	1	2	3.81	BB/NCBI

TBC1D5	TBC1 domain family member 5	TISSSP**S**IE**S**LPGGR	0.997	2	2	2.33	BB/NCBI
RIF1	Telomere-associated protein RIF1	SSD**S**VDIGEQEEK	0.999	1	2	4.13	BB/NCBI
SLC26A8	Testis anion transporter 1	AEIP**S**GDEQEQEHNGPLDNK	1.000	1	2	2.27	BB/NCBI
TTC7A	tetratricopeptide repeat protein 7A	DG**S**FEGLTVK	1.000	1	2	2.24	BB/NCBI
TMX1	thioredoxin-related transmembrane protein 1-like	VEEEQEADEEDV**S**EEDTENK	1.000	1	2	4.93	BB/NCBI
THOC1	THO complex subunit 1	TGEDEDEEDNDALLKENE**S**PDVR	1.000	1	3	5.38	BB/NCBI
THUMPD1	THUMP domain-containing protein 1-like	FIDKDQQH**S**G**S**EGEDDDVEAALK	1.000	2	3	4.26	BB/NCBI
THRAP3	thyroid hormone receptor-associated protein 3-like	ASVSDL**S**PR	1.000	1	2	2.97	BB/NCBI
THRAP3	thyroid hormone receptor-associated protein 3-like	GSF**S**DADVK	1.000	1	2	2.56	BB/NCBI
TRIP11	Thyroid receptor-interacting protein 11	LSVHDLKPLD**S**PGR	1.000	1	3	4.31	BB/NCBI
TJP2	Tight junction protein ZO-2	DG**S**PPPAFKPEPPK	1.000	1	2	2.39	BB/NCBI
TOR1AIP1	Torsin-1A-interacting protein 1	LEQTSQQPQPQL**S**PATSR	0.998	1	2	4.41	BB/NCBI
TRAIP	TRAF-interacting protein	AR**S**PVQDVLK	1.000	1	2	2.87	BB/NCBI
TFAP4	transcription factor AP-4-like	FIQELSGS**S**PK	0.996	1	2	2.73	BB/NCBI
TFDP1	transcription factor Dp-1 isoform 1	VFIDQNL**S**PGK	1.000	1	2	2.36	BB/NCBI
TRIM28	Transcription intermediary factor 1-beta	**S**GEGEVSGLMR	1.000	1	2	2.93	BB/NCBI
ATRX	Transcriptional regulator ATRX	EVIEIEDA**S**PTK	1.000	1	2	3.17	BB/NCBI
ATRX	Transcriptional regulator ATRX	LTV**S**DGE**S**GEEEKK	0.999	2	2	2.83	BB/NCBI
GATAD2A	Transcriptional repressor p66 alpha	DTSTEALLKS**S**PEER	0.993	1	2	2.87	BB/NCBI
TFRC	Transferrin receptor protein 1	LAVDEEEN**T**DNNMK	1.000	1	2	3.54	BB/NCBI
TAGLN2	transgelin-2-like	NF**S**DNQLQEGK	1.000	1	2	3.69	BB/NCBI
EIF2B5	translation initiation factor eIF-2B subunit epsilon-like	AV**S**PQLDDIK	1.000	1	2	2.91	BB/NCBI
TFIP11	tuftelin-interacting protein 11-like	GAAEEAD**S**DD**S**DDDEKPAKQEDFPK	1.000	2	3	4.89	BB/NCBI
BAZ1B	Tyrosine-protein kinase BAZ1B	LADDEGD**S**DSESVGQSR	1.000	1	2	5.37	BB/NCBI
BAZ1B	Tyrosine-protein kinase BAZ1B	RQ**S**LELQK	1.000	1	2	2.66	BB/NCBI
PTPN12	Tyrosine-protein phosphatase non-receptor type 12	DVDVSEE**S**PPPLPER	1.000	1	2	2.88	BB/NCBI
MPHOSPH10	U3 small nucleolar ribonucleoprotein protein MPP10	LETDAEEEQL**S**DVAADAPK	1.000	1	2	5.21	BB/NCBI
MPHOSPH10	U3 small nucleolar ribonucleoprotein protein MPP10	VTFALPEDEAEDT**S**PLAVK	1.000	1	2	5.05	BB/NCBI
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	KS**S**DDE**S**EEDEDDLLQR	0.991	2	2	2.52	BB/NCBI
USP15	ubiquitin carboxyl-terminal hydrolase 15-like	**S**PGASNFSALPK	1.000	1	2	2.23	BB/NCBI
USP24	Ubiquitin carboxyl-terminal hydrolase 24	VSDQN**S**PVLPK	1.000	1	2	3.06	BB/NCBI
N/A	Uncharacterized protein C20orf135-like	NSATFK**S**FEDR	1.000	1	2	2.70	BB/NCBI
FAM208A	Uncharacterized protein C3orf63-like	GAQ**S**PLLEVDAASVK	1.000	1	2	3.43	BB/NCBI

C9orf78	uncharacterized protein C9orf78 homolog	RADSESEEDEQESEEVR	1.000	2	2	3.58	BB/NCBI
CXorf23	Uncharacterized protein CXorf23-like	VQEESYPQSPR	1.000	1	2	3.89	BB/NCBI
N/A	Uncharacterized protein KIAA1267	LSPSTDSSSNLTNVK	1.000	1	2	2.46	BB/NCBI
KIAA1522	Uncharacterized protein KIAA1522	GLAGPPASPGK	1.000	1	2	2.87	BB/NCBI
PBDC1	UPF0368 protein Cxorf26 homolog	GADNEEEESEKGADSGGEKEEGVNR	1.000	2	3	4.32	BB/NCBI
VPS4B	Vacuolar protein sorting-associated protein 4B	EEQSSAVDEKGNDSDGEAESDDPEK	1.000	1	3	4.90	BB/NCBI
HDLBP	vigilin-like	VATLNSEEESDPPTYK	0.995	1	2	4.45	BB/NCBI
WDHD1	WD repeat and HMG-box DNA-binding protein 1	SHILGDDENSVDAPMLK	1.000	1	2	2.89	BB/NCBI
YLPM1	YLP motif-containing protein 1	SGGPLPESPR	1.000	1	2	2.75	BB/NCBI
ZC3H13	Zinc finger CCCH domain-containing protein 13	GNLETSEDAQVFSPK	1.000	1	2	3.63	BB/NCBI
ZC3H13	Zinc finger CCCH domain-containing protein 13	SKGDSDVSDEEVAPQSK	1.000	2	2	3.60	BB/NCBI
ZC3H13	Zinc finger CCCH domain-containing protein 13	SLSPSHLSEDR	0.999	1	2	2.48	BB/NCBI
ZMYM4	zinc finger MYM-type protein 4	ASHHESDNENEIQIQNK	1.000	1	3	5.24	BB/NCBI
ZNF106	zinc finger protein 106	ATGDGSSPELPSLER	1.000	2	2	2.38	BB/NCBI
ZNF106	zinc finger protein 106	SLSESSVIVDR	0.993	1	2	2.38	BB/NCBI
ZNF148	Zinc finger protein 148	GGLLTSEEDSGFSTSPK	0.994	1	2	3.83	BB/NCBI
ZNF592	zinc finger protein 592	EAIQTPSEENESPLK	1.000	1	2	2.30	BB/NCBI
ZNF609	zinc finger protein 609-like, partial	APSLTDLVK	1.000	1	2	2.91	BB/NCBI
ZNF438	zinc finger protein 828	TGPSLSPEPQK	1.000	1	2	3.60	BB/NCBI
PFKL	6-phosphofructokinase, liver type	TLSIDKGF	0.999	1	2	2.42	NCBI
ACACA	acetyl-CoA carboxylase 1	SSMSGLHLVK	1.000	1	2	3.02	NCBI
AFAP1	actin filament-associated protein 1 isoform 1	SGTSSPQSPVFR	1.000	1	2	2.52	NCBI
AKAP8L	A-kinase anchor protein 8-like	ADSDGDLSENDDGAGDLR	1.000	2	2	3.99	NCBI
AKAP9	A-kinase anchor protein 9	EGSLQDLDISETSVK	1.000	1	2	2.44	NCBI
PARVA	alpha-parvin-like	KKDDSFLGK	1.000	1	2	2.88	NCBI
TXLNA	alpha-taxilin	EQGLESPGAQPSSSPR	1.000	1	2	2.68	NCBI
MKI67	Antigen KI-67	RESVNLDESEGAK	1.000	1	2	3.00	NCBI
DDX24	ATP-dependent RNA helicase DDX24	AQAVSEEEEEGEEEGESSSPQK	1.000	1	2	4.52	NCBI
ARID1A	AT-rich interactive domain-containing protein 1A	GPSPSPVGSPASVAQSR	1.000	1	2	2.97	NCBI
ARID4A	AT-rich interactive domain-containing protein 4A	ILGQPSPEKK	1.000	1	2	2.31	NCBI
BIRC6	baculoviral IAP repeat-containing protein 6	LEGDSDDLLEDSDSEEHSR	0.991	1	2	4.05	NCBI
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	TETDISTVEQSSPSSK	0.997	1	2	4.56	NCBI
BAHD1	Bromo adjacent-likey domain-containing 1 protein	DLSPEPTPDEGAR	1.000	1	2	2.47	NCBI
BAZ1A	bromodomain adjacent to zinc finger domain protein 1A	RLSLGQEDNIASK	1.000	1	2	3.96	NCBI
BRD3	bromodomain-containing protein 3 isoform 1	SESPPPLSEPK	1.000	1	2	2.56	NCBI
BRD4	Bromodomain-containing protein 4	IHSPIIR	1.000	1	2	2.74	NCBI

CLIP1	CAP-Gly domain-containing linker protein 1	TASESISNLSEAG**S**VK	1.000	2	2	2.81	NCBI
CTNND1	Catenin delta-1	AP**S**RQDVYGPQPQVR	1.000	1	3	3.92	NCBI
CD2BP2	CD2 antigen cytoplasmic tail-binding protein 2-like	HSLD**S**DEEDDDDEGSSK	1.000	1	2	4.91	NCBI
CDC42EP4	cdc42 effector protein 4-like	NAM**S**LPQLNEK	1.000	1	2	3.23	NCBI
CENPC	centromere protein C 1	IVIGIV**S**PAPV**S**PK	1.000	2	2	4.49	NCBI
CENPQ	centromere protein Q-like	DLDVLHNS**S**PVK	0.998	1	2	3.12	NCBI
CEP170	Centrosomal protein of 170 kDa	SIK**S**DVPVYLK	0.991	1	2	2.59	NCBI
PCYT1A	Choline-phosphate cytidylyltransferase A	MLQAI**S**PR	1.000	1	2	2.54	NCBI
CLASP1	CLIP-associating protein 1	SR**S**DIDVNAAASAK	0.998	1	2	5.39	NCBI
CLASP2	CLIP-associating protein 2	SR**S**DIDVNAAAGAK	0.998	1	2	4.57	NCBI
CLUAP1	Clusterin-associated protein 1	KPEPLDE**S**DNDF	1.000	1	2	3.00	NCBI
DENND4A	C-myc promoter-binding protein	MN**S**SFSVKPSEK	0.999	1	2	2.71	NCBI
DENND4A	C-myc promoter-binding protein	TP**S**IDLQR	1.000	1	2	3.02	NCBI
CC2D1A	coiled-coil and C2 domain-containing protein 1A-like isoform 1	LANHDEG**S**EEEEDEAPK	1.000	1	2	4.01	NCBI
CCDC6	Coiled-coil domain-containing protein 6	LDQPV**S**APP**S**PR	1.000	2	2	2.30	NCBI
CCDC94	coiled-coil domain-containing protein 94-like isoform 2	LLED**S**D**S**EDEAPPSRPR	1.000	2	2	2.55	NCBI
CRTC3	CREB-regulated transcription coactivator 3-like, partial	**S**NPSIQATLNK	1.000	1	2	2.73	NCBI
CDK17	cyclin-dependent kinase 17	RA**S**LSEIGFGK	0.999	1	2	2.45	NCBI
SLC7A11	Cystine/glutamate transporter	GGYLQGNV**S**GR	1.000	1	2	3.14	NCBI
SLC7A11	Cystine/glutamate transporter	LP**S**MGDQEAPGQEK	1.000	1	2	4.06	NCBI
DENND4C	DENN domain-containing protein 4C	VP**S**GLFDTNNR	1.000	1	2	2.48	NCBI
DIS3L2	DIS3-like exonuclease 2 isoform 1	SLGLEKE**S**DEEPED	1.000	1	2	2.86	NCBI
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	**S**FEDLTDHPVTR	1.000	1	2	2.72	NCBI
DLG1	Disks large-like 1	EQLMSSSISSGSG**S**LR	0.999	1	2	4.70	NCBI
ERCC6	DNA excision repair protein ERCC-6	IL**S**DDEGEEDAFK	1.000	1	2	3.49	NCBI
POLD3	DNA polymerase delta subunit 3	VDL**S**DEEAKETENLK	1.000	1	2	2.25	NCBI
CD3EAP	DNA-directed RNA polymerase I subunit RPA34	mQPPDGTIL**T**PTK	0.999	1	2	2.77	NCBI
EML3	Echinoderm microtubule-associated protein-like 3	AA**S**SANLLLR	0.991	1	2	2.78	NCBI
EML4	Echinoderm microtubule-associated protein-like 4	A**S**P**S**PQPSSQPLQINR	1.000	2	2	2.87	NCBI
ELMOD3	ELMO domain-containing protein 3	TE**S**GERPAGDSDFSLKPGK	0.999	1	3	3.82	NCBI
EEF2K	Elongation factor 2 kinase	KPE**S**DEDSLGSYGR	1.000	1	2	2.26	NCBI
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	EATLPPV**S**PPK	1.000	2	2	2.46	NCBI
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PGPVQTAIIAPK	1.000	1	2	2.74	NCBI

EIF5B	eukaryotic translation initiation factor 5B-like	NKPLPNIE**S**GNEDDDSFK	1.000	1	2	4.15	NCBI
EIF5B	eukaryotic translation initiation factor 5B-like	TSFDDND**S**EELEDKDSK	1.000	1	2	4.66	NCBI
EIF5B	eukaryotic translation initiation factor 5B-like	VEIF**S**G**S**EDDDDSNK	1.000	2	2	3.98	NCBI
FARP1	FERM, RhoGEF and pleckstrin domain-containing protein 1-like	VSALESGPHQ**S**PALSK	1.000	1	2	2.54	NCBI
FNDC3B	Fibronectin type III domain-containing protein 3B	LN**S**PPSTIYK	0.999	1	2	2.69	NCBI
FIGNL1	fidgetin-like protein 1-like	AE**S**TETAHAIDDR	0.999	1	2	3.14	NCBI
FLNA	Filamin-A	AFGPGLQGGNAG**S**PAR	1.000	1	2	3.43	NCBI
FLNA	Filamin-A	AP**S**VANVGSHcDLSLK	1.000	1	2	3.01	NCBI
FLNC	Filamin-C	LG**S**FGSITR	1.000	1	2	2.32	NCBI
FKBP15	FK506-binding protein 15	HNQDSQHSSL**S**GDEDDELFK	1.000	1	3	4.17	NCBI
FOSL2	fos-related antigen 2-like	**S**PPTAGLQPIR	1.000	1	2	2.40	NCBI
FAM160A2	FTS and Hook-interacting protein-like isoform 2	QQ**S**LGGSESPGPAPR	1.000	1	2	2.34	NCBI
AGPAT9	glycerol-3-phosphate acyltransferase 3	NSA**S**VGIIQR	1.000	1	2	4.03	NCBI
GOLGA3	Golgin subfamily A member 3	DVLQSAAAQHQDQNQEVNGEVQ**S**R	1.000	1	3	5.48	NCBI
HSPH1	Heat shock protein 105 kDa	IE**S**PKLER	1.000	1	2	2.33	NCBI
HMGA1	high mobility group protein HMG-I/HMG-Y-like	EEEEGISQE**SS**EEEQ	1.000	2	2	2.33	NCBI
HIRIP3	HIRA-interacting protein 3-like	HKE**S**ED**S**EEETLAK	1.000	2	2	3.76	NCBI
HIRIP3	HIRA-interacting protein 3-like	LEE**SS**DEEGEGSVR	1.000	2	2	4.39	NCBI
HIRIP3	HIRA-interacting protein 3-like	VWEEED**T**EEDDDVKK	1.000	1	2	4.28	NCBI
N/A	hypothetical protein I79_008270	GN**S**PAAFPDR	1.000	1	2	3.29	NCBI
N/A	hypothetical protein LOC100756984, partial	IQT**S**PE**S**DPEIDR	0.997	2	2	3.03	NCBI
INCENP	Inner centromere protein	VEKPATIAGENG**S**PVLR	1.000	1	3	4.79	NCBI
IRS1	insulin receptor substrate 1-like	HS**S**ETFSAPTR	0.994	1	2	2.95	NCBI
IRF2BP2	Interferon regulatory factor 2-binding protein 2	**S**PADSLSGASGASELGADGAGK	0.999	1	2	3.89	NCBI
IRF2BPL	interferon regulatory factor 2-binding protein 2-like, partial	LEEPPELNRQ**S**PNPR	1.000	1	2	2.65	NCBI
IRF2BPL	interferon regulatory factor 2-binding protein-like	KA**S**PEPPDSAESALK	1.000	1	2	3.49	NCBI
LMNA	Lamin-A/C	SGAQASSTPL**S**PTR	0.999	1	2	3.85	NCBI
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	EL**S**QEVAEPEEALIQSPPTSK	1.000	1	2	4.26	NCBI
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	**S**VNEGAEQSLER	1.000	1	2	3.73	NCBI
KDM2A	Lysine-specific demethylase 2A	KIEE**S**DEEAVQAK	1.000	1	2	4.29	NCBI
CCM2	Malcavernin	GIITD**S**FGR	0.994	1	2	2.54	NCBI
MDC1	Mediator of DNA damage checkpoint protein 1	DPGAPVVTHLQD**S**PAGR	1.000	1	2	2.71	NCBI
MTA3	Metastasis-associated protein MTA3	HAELAG**S**PLK	1.000	1	2	3.02	NCBI
MICALL2	MICAL-like protein 2	LP**S**PAPVQR	1.000	1	2	2.61	NCBI
MAP1B	Microtubule-associated protein 1B	ASI**S**PmDEPVPDSESPIEK	0.990	1	2	3.32	NCBI
MAP1B	Microtubule-associated protein 1B	SLM**SS**PEDLTK	1.000	2	2	4.06	NCBI
MAP4	Microtubule-associated protein 4	VG**S**LDNVGHLPAGGAVK	1.000	1	2	3.17	NCBI

MDN1	midasin-like	RQDEKEE**S**EPEDVEQSQEK	1.000	1	3	4.07	NCBI
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	SH**S**FSDPSPPK	0.990	1	2	3.23	NCBI
MYO18A	Myosin-XVIIIa	LEGD**S**DVDSELEDR	1.000	1	2	4.42	NCBI
NHSL1	NHS-like protein 1	NH**S**P**S**PPVTPTGAAPSLASPK	1.000	2	3	4.16	NCBI
SETD6	N-lysine methyltransferase SETD6-like	APL**S**PPAPGR	1.000	1	2	3.02	NCBI
NUP153	Nuclear pore complex protein Nup153	RIPSAVS**S**PLN**S**PLDR	0.992	2	2	4.27	NCBI
NUP98	Nuclear pore complex protein Nup98-Nup96	YGLQD**S**DEEEEEHPPK	1.000	1	2	3.53	NCBI
NCOA3	Nuclear receptor coactivator 3	AV**S**LDSPVSVGSGPPVK	1.000	1	2	4.11	NCBI
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	TSASSPLEK**S**GDEG**S**EDEAP**S**GED	1.000	3	2	3.38	NCBI
NOLC1	Nucleolar phosphoprotein p130	LQ**T**PN**T**FPK	1.000	2	2	3.62	NCBI
OTUD7B	OTU domain-containing protein 7B-like	GI**S**HASSSIVSLAR	1.000	1	2	2.59	NCBI
OSBP	Oxysterol-binding protein 1	MLAE**S**DE**S**GDEESVSQTDK	1.000	2	2	5.04	NCBI
PALLD	palladin-like	IA**S**DEEIQGTK	1.000	1	2	2.75	NCBI
PARD3B	Partitioning defective 3-like	**S**MDLGIADETK	1.000	1	2	2.35	NCBI
PSIP1	PC4 and SFRS1-interacting protein	EAELSLKE**S**PLDN	1.000	1	2	3.40	NCBI
PSIP1	PC4 and SFRS1-interacting protein	NVAKPGVTST**S**D**S**EDEDDQEGGEK	0.997	2	3	4.19	NCBI
PPIG	peptidyl-prolyl cis-trans isomerase G-like isoform 1	DQ**S**PVVLKPK	1.000	1	2	2.49	NCBI
PCM1	Pericentriolar material 1 protein	VTNDI**S**PESSPGVGR	0.991	2	2	2.80	NCBI
GIGYF1	PERQ amino acid-rich with GYF domain-containing protein 1	**S**IEEGDGAFGR	1.000	1	2	3.34	NCBI
PHIP	PH-interacting protein	VL**S**D**S**EEEEKDADVPGTSTR	1.000	2	2	2.85	NCBI
PPP1R18	Phostensin	DIETPQKPGPPA**S**PEK	1.000	1	2	2.27	NCBI
PHLDB1	Pleckstrin-likey-like domain family B member 1	SALLAQNGTS**S**LPR	0.998	1	2	3.21	NCBI
PHLDB2	Pleckstrin-likey-like domain family B member 2	RL**S**AGTTVADVQK	0.990	1	2	3.16	NCBI
PLEC	plectin	AQLEPVA**S**PAK	1.000	1	2	2.41	NCBI
PHC3	polyhomeotic-like protein 3-like isoform 1	mDR**T**PPPPTL**S**PAAITVGR	1.000	2	3	4.00	NCBI
PTRF	polymerase I and transcript release factor-like	LPAKL**S**VSK	1.000	1	2	2.37	NCBI
Ctla2b	protein CTLA-2-beta-like	YTEE**S**PTSENVEEK	1.000	1	2	3.72	NCBI
DIAPH3	protein diaphanous homolog 3-like	GL**S**PAPPSGPHEPGEK	1.000	1	2	2.69	NCBI
IWS1	Protein IWS1-like	AAVL**S**D**S**EDEDKASAK	1.000	2	2	3.00	NCBI
ZMYND8	Protein kinase C-binding protein 1	LPPSTAAGNQ**S**PPETPVLTR	1.000	1	2	4.27	NCBI
LNP	Protein lunapark	AD**S**VSNLEPSGESLVTQ	0.994	1	2	3.81	NCBI
SCRIB	Protein scribble-like	MK**S**LEQDALR	1.000	1	2	2.30	NCBI
SCRIB	Protein scribble-like	N**S**LESISSIDR	1.000	1	2	2.21	NCBI
SESTD1	Protein SOLO	IQQQLGEEA**S**PR	1.000	1	2	3.26	NCBI
TIMELESS	Protein timeless-like	ELLD**S**DEEEDEGR	1.000	1	2	4.03	NCBI
TATDN2	Putative deoxyribonuclease TATDN2	VTVTVPQKEE**S**PTK	0.999	1	2	2.86	NCBI

DHX16	putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16-like, partial	LLED**S**E**S**GEEAVGSDSSSLQK	1.000	2	2	3.14	NCBI
RBM15	Putative RNA-binding protein 15	SL**S**PGGAALGYR	0.996	1	2	3.01	NCBI
PYGO2	pygopus homolog 2-like	GGG**T**PDANSLAPPGK	1.000	1	2	3.37	NCBI
RMDN3	Regulator of microtubule dynamics protein 3	SH**S**LPDSLDR	1.000	1	2	2.70	NCBI
RBL1	retinoblastoma-associated protein-like	KSNPDEEANVVTPH**T**PVR	1.000	2	3	4.02	NCBI
ARHGEF5	rho guanine nucleotide exchange factor 5-like	SN**S**FPGFHR	0.996	1	2	2.26	NCBI
ARHGEF7	rho guanine nucleotide exchange factor 7-like	KP**S**DEEFAVR	1.000	1	2	2.91	NCBI
RNF219	RING finger protein 219	SVELEGSSK**S**PR	0.996	1	2	2.44	NCBI
RBM39	RNA-binding protein 39 isoform a	DK**S**PVREPIDNLTPEER	1.000	1	3	4.53	NCBI
RBM39	RNA-binding protein 39 isoform a	IGLPH**S**IK	1.000	1	2	2.50	NCBI
RUNX1	Runt-related transcription factor 1	RF**T**PPSTAL**S**PGK	0.998	2	2	2.28	NCBI
SAFB	Scaffold attachment factor B1	SVV**S**FDKVK	1.000	1	2	2.72	NCBI
SAFB2	Scaffold attachment factor B2	APTASL**S**PEPQDSK	0.999	1	2	4.09	NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	RY**S**PPIQR	1.000	1	2	2.30	NCBI
SRRM1	Serine/arginine repetitive matrix protein 1	**S**P**S**PAPPPPPPPR	1.000	2	2	2.27	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	GMLQ**T**PPEQNVPASK	1.000	1	2	2.64	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	HV**SSS**PESLKPTPAPGAR	0.995	3	2	2.41	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	mAPALSGANLT**S**PR	0.992	1	2	3.37	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	NSGPISEVNAGF**S**PEVK	1.000	1	2	2.80	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SEL**S**PEQVK	1.000	1	2	2.43	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SEQPLSQVIQSL**S**PEHK	0.998	1	2	2.70	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SIAQT**T**PVAGSQSLSSGTVAK	0.995	1	2	4.12	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PGMLEPLGSAR	1.000	1	2	2.54	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PVPSAFSDQSR	1.000	1	2	2.53	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	SSSEL**S**PEVVEK	0.999	1	2	3.35	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	TPAAAAAMNLA**S**PR	1.000	1	2	3.99	NCBI
SRRM2	Serine/arginine repetitive matrix protein 2	VP**S**PVPAPK	1.000	1	2	2.33	NCBI
STK11IP	Serine/threonine kinase 11-interacting protein	RA**S**ISEPSDTDPELR	0.990	1	2	3.30	NCBI
NEK10	Serine/threonine-protein kinase Nek10	NGILASPQ**S**APGNLDNSK	1.000	1	2	3.07	NCBI
PPP2R5D	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform	RK**S**ELPQDVYTIK	1.000	1	2	2.89	NCBI
SH3PXD2A	SH3 and PX domain-containing protein 2A	AA**S**QGSESPLLPTQR	1.000	1	2	2.31	NCBI
SH3PXD2A	SH3 and PX domain-containing protein 2A	AQIS**S**PNLR	0.993	1	2	2.29	NCBI
SH3PXD2A	SH3 and PX domain-containing protein 2A	NE**S**LTATDSLR	1.000	1	2	2.81	NCBI
PDS5B	Sister chromatid cohesion protein PDS5-like B	AE**S**PESSAVESTQSTPQK	1.000	1	2	5.94	NCBI
PDS5B	Sister chromatid cohesion protein PDS5-like B	METVSNASSSSNPS**S**PGR	0.994	1	2	3.13	NCBI
SNUPN	Snurportin-1	LK**S**PPH**S**PGNLMDN	1.000	2	2	2.58	NCBI
SLC9A1	Sodium/hydrogen exchanger 1	IG**S**DPLAYEPK	1.000	1	2	2.64	NCBI

SF3A1	splicing factor 3A subunit 1 isoform 1	FGESEEVEmEVE**S**DEEDEKQEK	1.000	1	3	4.01	NCBI
SF3B2	Splicing factor 3B subunit 2	GFEEEHKD**S**DDD**SS**DDEQEKKPEAPK	1.000	3	3	4.03	NCBI
SF3B2	Splicing factor 3B subunit 2	SSLGQSA**S**ETEEDTVSISK	0.995	2	2	3.75	NCBI
STARD13	stAR-related lipid transfer protein 13 isoform 1	KKGDD**S**DEEDLcISNK	1.000	1	3	4.44	NCBI
SVIL	Supervillin	GTSFPEVPR**S**PK	1.000	1	2	2.67	NCBI
SVIL	Supervillin	RG**S**LELGNPSVSHLGDEVK	1.000	1	3	4.14	NCBI
TLN2	Talin-2	LDEG**T**PPEPK	1.000	1	2	2.63	NCBI
TBC1D17	TBC1 domain family member 17	EPSSP**S**PPISPLPLSTR	1.000	2	2	3.01	NCBI
RIF1	Telomere-associated protein RIF1	RQ**S**FITLEK	0.995	1	2	2.24	NCBI
TNIK	Traf2 and NCK-interacting protein kinase	QN**S**DPTSENPPLPTR	1.000	1	2	2.57	NCBI
TRAF3IP1	TRAF3-interacting protein 1-like	RQE**S**TETLVGDR	0.997	1	2	2.58	NCBI
JUN	transcription factor AP-1-like	LA**S**PELER	1.000	1	2	2.94	NCBI
Tfe3	transcription factor E3-like isoform 1	AA**S**DPLLSSVSPAVSK	1.000	1	2	2.68	NCBI
JUNB	transcription factor jun-B-like	DA**T**PPV**S**PINMEDQER	1.000	2	2	2.28	NCBI
ATRX	Transcriptional regulator ATRX	AA**S**EN**S**ENDITMQSLPK	1.000	2	2	2.29	NCBI
ATRX	Transcriptional regulator ATRX	VcDQTAKL**S**PK	1.000	1	2	3.24	NCBI
TACC2	Transforming acidic coiled-coil-containing protein 2	LDNTPA**S**PPR**S**PTEPNDIPIAK	0.999	2	3	4.35	NCBI
TMCO1	transmembrane and coiled-coil domains protein 1 isoform 1	ALGVISNFQS**S**PK	0.996	1	2	3.43	NCBI
N/A	Tripartite motif-containing protein 25	VTD**S**PAEEEEEAR	1.000	1	2	4.30	NCBI
TRIM47	Tripartite motif-containing protein 47	GLG**S**DEDELQK	1.000	1	2	2.88	NCBI
TSC22D1	TSC22 domain family protein 4	VDVESGSSAAG**T**PPLSR	1.000	1	2	4.15	NCBI
TNFRSF10B	tumor necrosis factor receptor superfamily member 10B-like	APEEPEVAPEN**S**PMGR	1.000	1	2	3.48	NCBI
ABL2	Tyrosine-protein kinase ABL2	DK**S**PSSLLEDAK	0.999	1	2	2.76	NCBI
ABL2	Tyrosine-protein kinase ABL2	SAQASSG**S**PALPR	0.999	1	2	2.39	NCBI
SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa-like	GGGG**S**GQDNGLEGLGSDGR	1.000	1	2	3.92	NCBI
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	EEA**S**DDDmEGDEAVVR	1.000	1	2	3.93	NCBI
KIAA1551	uncharacterized protein C12orf35 homolog	NTFLVQSV**S**PEK	1.000	1	2	3.67	NCBI
N/A	uncharacterized protein C14orf43-like isoform 1	RA**S**QEANLLTLAQK	1.000	1	3	4.44	NCBI
CACTIN	uncharacterized protein C19orf29 homolog	**S**PGATALALSQQQSLQER	0.999	1	2	3.88	NCBI
SOGA1	Uncharacterized protein C20orf117	TGQPPQPAPSGQQPPRPPA**S**PDEPSVAASSVGSSR	0.999	1	3	4.05	NCBI
UTRN	Utrophin	AQTSLN**S**LNDLTK	1.000	1	2	3.05	NCBI
Wipf1	WAS/WASL-interacting protein family member 1-like	NL**S**LTSSAPPLPSPGR	1.000	1	2	4.39	NCBI
ZC3H13	Zinc finger CCCH domain-containing protein 13	AAVVA**S**PLLDQQR	1.000	1	2	3.29	NCBI
ZC3H14	Zinc finger CCCH domain-containing protein 14	DLVQPDKPA**S**PK	1.000	1	2	2.72	NCBI

ZC3H18	zinc finger CCCH domain-containing protein 18 isoform 2	LGV**S**V**S**PSR	0.990	2	2	2.23	NCBI
ZHX2	zinc fingers and homeoboxes protein 2-like	VAEGTADRPD**S**D**S**DSAPAEAGHA	0.999	2	3	4.35	NCBI
ELAC2	zinc phosphodiesterase ELAC protein 2-like, partial	ALTEEPH**S**PQSK	0.995	1	2	2.65	NCBI
ARMC10	Armadillo repeat-containing protein 10	**S**AEDLTDGSYDEVLNAK	1.000	1	2	5.91	BB
TOP2A	DNA topoisomerase 2-alpha	AQMSEVLP**S**PHGK	1.000	1	2	2.79	BB
FXR1	Fragile X mental retardation syndrome-related protein 1	AINGPTSA**S**GDEIPK	0.999	1	2	3.35	BB
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	QDFESL**S**PPR	0.994	1	2	2.44	BB
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	SQVI**S**PPLAR	1.000	1	2	2.70	BB
MTBP	Mdm2-binding protein	GEKPLVLTPEL**S**PR	1.000	1	2	3.46	BB
SLC16A1	Monocarboxylate transporter 1	ATESPQQNSSGDPAEEE**S**PV	1.000	1	2	3.95	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	FGTFGGLG**S**K	1.000	1	2	2.27	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	FKAEASLP**S**PK	0.997	1	2	3.51	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	GGVTG**S**PEASISGSK	0.999	1	2	3.30	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	GHYEVTG**S**DDEAVK	0.996	1	2	4.35	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	GP**S**VDIDTPDVNIEGPEGK	1.000	1	2	5.26	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	GSGIGLHDV**S**VK	1.000	1	2	2.27	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	I**S**MADVDLNVASPK	1.000	1	2	4.42	BB
AHNAK	Neuroblast differentiation-associated protein AHNAK	VG**S**PGVNVSAK	1.000	1	2	2.24	BB
INPPL1	Phosphatidylinositol-3,4,5-trisphosphate 5-phosphatase 2	DA**S**DVEDEKPPLPPR	1.000	1	2	2.50	BB
NDRG1	Protein NDRG1	TA**S**GSSVTSLEGPR	0.992	1	2	4.45	BB
SRSF2	Serine/arginine-rich splicing factor 2	**S**K**S**PPKSPEEEGAVSS	1.000	3	2	2.31	BB
STMN1	Stathmin	ESVPDFPL**S**PPK	1.000	1	2	2.98	BB
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	GHLHG**SS**DD**S**EVEDEAKDTLPSQK	1.000	3	3	4.08	BB
AEBP2	Zinc finger protein AEBP2	RG**S**LEMSSDGEPLSR	1.000	1	2	2.67	BB

Table 4.3.7: List of phosphopeptides identified as common to Titanium dioxide and Gallium phosphopeptide enrichments of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
BCLAF1	Bcl-2-associated transcription factor 1	FND**S**EGDDTEETEDYR	1.000	1	2	4.8	BB/NCBI
PRKAR2A	cAMP-dependent protein kinase type II-alpha regulatory subunit-like, partial	RV**S**VcAESYNPDEEEEDTEPK	1.000	1	3	4.1	BB/NCBI
CDK11A	Cyclin-dependent kinase 11	DLLSDLQDI**S**DSER	1.000	1	2	4.4	BB/NCBI
EEF1B2	elongation factor 1-beta-like	DDDDIDLFG**S**DDEEESEEAK	1.000	1	2	5.2	BB/NCBI
Q13547	Histone deacetylase 1	mLPHAPGVQmQAIPEDAIPEE**S**GDEDEEDPDKR	1.000	1	3	4.6	BB/NCBI
LIMA1	LIM domain and actin-binding protein 1	**S**LDDLEIGLGHLSSSSFNSEK	1.000	1	3	5.1	BB/NCBI
METTL10	Methyltransferase-like protein 10	EG**S**PVAADFVPSALGTR	1.000	1	2	4.5	BB/NCBI
NACA	Nascent polypeptide-associated complex subunit alpha	VQGEAVSNIQENTQTPTVQEE**S**EEEEVDETGVEV K	0.993	1	3	5.4	BB/NCBI
NPM3	Nucleoplasmin-3	IVcINNDL**S**EE**S**EDDESEEGEVK	0.998	2	3	4.2	BB/NCBI
SIN3A	Paired amphipathic helix protein Sin3a	GDL**S**DVEEEEEEEmDVDEATGAPK	1.000	1	2	6.4	BB/NCBI
N/A	Putative GTP-binding protein Parf	NISL**SS**EEEDEGLAGHPR	1.000	2	2	4.2	BB/NCBI
G3BP1	Ras GTPase-activating protein-binding protein 1	SA**S**PAPADVAPAQEDLR	0.993	1	2	4.7	BB/NCBI
SASH1	SAM and SH3 domain-containing protein 1	SH**S**LDDLQGEADAGK	0.992	1	2	4.9	BB/NCBI
TNS1	Tensin-1	HLGGSGSVVPG**S**PSLDR	0.998	1	2	3.7	BB/NCBI
USP14	Ubiquitin carboxyl-terminal hydrolase 14	A**S**GEmASAQYITAALR	1.000	1	2	4.2	BB/NCBI
UFD1L	ubiquitin fusion degradation protein 1 homolog	FVAFSGEGQ**S**LR	1.000	1	2	2.9	BB/NCBI
CSRP1	cysteine and glycine-rich protein 1-like	GFGFGQGAGALVH**S**E	1.000	1	2	3.7	NCBI

Table 4.3.8: List of phosphopeptides identified as common to Iron and Gallium phosphopeptide enrichments of temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift following analysis by LC/MS.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	Database
HDGF	Hepatoma-derived growth factor	AGDMLED**S**PK	1.000	1	2	2.9	BB/NCBI

Table 4.3.9: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that was found to be unique to the CHO BB protein database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
TNKS1BP1	182 kDa tankyrase-1-binding protein	RD**S**LLDIR	1.000	2	2.6
MLLT4	Afadin	TI**S**NPEVVMK	0.999	2	2.8
Brca1	Breast cancer type 1 susceptibility protein homolog	LETSQM**S**DSTK	0.999	2	2.5
EEF2	Elongation factor 2	FSV**S**PVVR	1.000	2	2.4
Htatsf1	HIV Tat-specific factor 1-like	LFDD**S**DER	1.000	2	2.6
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	NQEIDcL**S**PEAQR	1.000	2	3.4
MYBBP1A	Myb-binding protein 1A	AESA**S**PTETTQDER	0.999	2	3.2
AHNAK	Neuroblast differentiation-associated protein AHNAK	GHYEVTG**S**DDEAVK	1.000	3	4.1
AHNAK	Neuroblast differentiation-associated protein AHNAK	VG**S**PGVNVSAK	1.000	2	2.3
PHACTR4	Phosphatase and actin regulator 4	SS**S**PVLVEEEAVR	0.999	2	3.5
NDRG1	Protein NDRG1	TA**S**GSSVTSLEGPR	0.996	2	3.4
RFC1	replication factor C subunit 1-like	NKPL**S**PIK	1.000	2	2.5
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	EVEDKE**S**EGEDEDEDEDLSK	1.000	3	3.8

Table 4.3.10: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that was found to be unique to the CHO NCBI protein database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
TNKS1BP1	182 kDa tankyrase-1-binding protein	EEGVSQQGSGAPLAPE**S**PGGPISGVR	1.000	3	4.2
AKAP2	A-kinase anchor protein 2	SP**S**DTMAEGER	1.000	2	3.5
MKI67	Antigen KI-67	YScE**S**PQPEEK	1.000	2	2.7
MKI67	Antigen KI-67	LDFTTN**S**TGR	0.992	2	2.7
MKI67	Antigen KI-67	LDFTGN**S**IGR	1.000	2	2.7
N/A	B-cell CLL/lymphoma 9-like protein isoform 2	SV**S**VDSGDQR	1.000	2	2.9
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	TETDISTVEQS**S**PSSK	0.995	2	3.9
CAD	CAD protein isoform 1	A**S**DPGLPAEEPK	1.000	2	2.4
EEF2K	eukaryotic elongation factor 2 kinase-like	DYENSGDSGYP**S**EK	1.000	2	2.8
EIF4G1	eukaryotic translation initiation factor 4 gamma 1 isoform 1	AA**S**LTEDR	1.000	2	2.7
EIF4B	Eukaryotic translation initiation factor 4B	YAAL**S**VDGEDENEGDDHAE	1.000	3	4.1
EIF5B	eukaryotic translation initiation factor 5B-like	VEIFSG**S**EDDDDSNK	1.000	2	3.7
EIF5B	eukaryotic translation initiation factor 5B-like	TSFDDND**S**EELEDK	1.000	2	2.5
EIF5B	eukaryotic translation initiation factor 5B-like	NKPLPNIE**S**GNEDDDSFK	1.000	3	4.6
FAF1	FAS-associated factor 1	TP**S**GEFLER	1.000	2	2.3
FLNC	Filamin-C	LG**S**FGSITR	1.000	2	2.7
FOXK2	Forkhead box protein K2	EG**S**PAPVEPEPGAAQPK	1.000	2	2.4
HNRNPL	heterogeneous nuclear ribonucleoprotein L	LKTEEGEIVY**S**AEESESR	0.997	3	4.1
HIRIP3	HIRA-interacting protein 3-like	TGTVGcVN**S**ESDmER	1.000	2	2.5
HIRIP3	HIRA-interacting protein 3-like	LTGGLGD**S**EEEK	1.000	2	2.7
HIRIP3	HIRA-interacting protein 3-like	LEES**S**DEEGEGSVR	0.992	2	2.5
N/A	hypothetical protein I79_008270	GN**S**PAAFPDR	1.000	2	3.6
IRF2BP2	Interferon regulatory factor 2-binding protein 2	**S**PADSLSGASGASELGADGAGK	0.998	2	2.5
LRRC47	Leucine-rich repeat-containing protein 47	RE**S**GEGEDEVADSAR	1.000	3	4.0
NELFE	negative elongation factor E-like	SD**S**FPER	1.000	2	2.2
NCOR1	Nuclear receptor corepressor 1	V**S**PEHLVDK	1.000	2	2.3
NOLC1	Nucleolar phosphoprotein p130	LQ**T**PN**T**FPK	1.000	2	2.8
PSIP1	PC4 and SFRS1-interacting protein	NVAKPGVTSTSD**S**EDEDDQEGGEK	1.000	3	5.5
PPIG	peptidyl-prolyl cis-trans isomerase G-like isoform 1	DQ**S**PVVLKPK	1.000	2	2.4
PPP1R18	Phostensin	KEETLSPGIALDQ**S**PVTK	1.000	3	4.2
AKT1S1	proline-rich AKT1 substrate 1-like	LN**T**SDFQK	1.000	2	2.8
PRKCD	Protein kinase C delta type	LLAEALNQV**S**QR	1.000	2	2.5
PATL1	Protein PAT1-like 1	ST**S**PVIGSPPVR	0.995	2	2.6
HNRNPA1	Putative heterogeneous nuclear ribonucleoprotein A1-like protein 3	SE**S**PKEPEQLR	0.993	2	2.3

ARHGAP12	Rho GTPase-activating protein 12	NcLPENES**S**PTSSK	0.991	2	2.7
SRRM2	Serine/arginine repetitive matrix protein 2	SS**S**PVTELVLR	1.000	2	3.0
SRRM2	Serine/arginine repetitive matrix protein 2	NSGPISEVNAGF**S**PEVK	1.000	2	3.0
PPP3CB	Serine/threonine-protein phosphatase 2B catalytic subunit beta isoform	Ic**S**FEEAK	1.000	2	2.3
SF3A1	splicing factor 3A subunit 1 isoform 1	AEEAPSQLDQDTQVQDMDEG**S**DDDEEGQK	1.000	3	4.7
SLIRP	SRA stem-loop-interacting RNA-binding protein, mitochondrial-like	AQT**S**DEDRDF	1.000	2	3.1
RIF1	Telomere-associated protein RIF1	VTAE**S**PIQENLTEK	1.000	2	3.0
THRAP3	Thyroid hormone receptor-associated protein 3	IDI**S**PSTFR	0.999	2	2.7
N/A	transcription factor E2-alpha-like isoform 2	TSS**T**DEVLSLEEK	0.993	2	2.5
ATRX	Transcriptional regulator ATRX	YVE**S**GDEKPMDENVNEK	1.000	3	4.1
ATRX	Transcriptional regulator ATRX	TVQGGL**S**GDDTGDTEK	1.000	2	3.3
TACC2	Transforming acidic coiled-coil-containing protein 2	LDNTPA**S**PPR**S**PTEPNDIPIAK	0.997	3	4.0
EIF2B5	translation initiation factor eIF-2B subunit epsilon-like	AV**S**PQLDDIK	1.000	2	2.5
TCOF1	Treacle protein	KL**S**GDQLAAGAPESK	1.000	2	3.5

Table 4.3.11: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that was found to be unique to the Swiss-Prot protein database containing sequences for Human, Mouse Rat and CHO (downloaded January 2011).

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
BCL10	B-cell lymphoma/leukemia 10	GLKcSScEPFAAGATNNL**S**R	1.000	3	5.2
Gfpt1	Glutamine--fructose-6-phosphate aminotransferase [isomerizing] 1	VD**S**TTcLFPVEEK	1.000	2	3.1
HSPH1	Heat shock protein 105 kDa	AF**S**DPFIQK	1.000	2	3.2
HNRNPAB	Heterogeneous nuclear ribonucleoprotein A/B	FGEVVDc**T**LK	1.000	2	2.7
Marcks	Myristoylated alanine-rich C-kinase substrate	AEDGAAPSPSSE**T**PK	0.993	2	3.1
AHNAK	Neuroblast differentiation-associated protein AHNAK	LQG**S**GVSLASK	1.000	2	3.0
AHNAK	Neuroblast differentiation-associated protein AHNAK	SN**S**FSDER	1.000	2	2.8
PPP1R18	Phostensin	L**S**PGETPEESLR	1.000	2	2.3
TLE4	Transducin-like enhancer protein 4	SSSV**S**PSASFR	0.990	2	2.3
UFD1L	Ubiquitin fusion degradation protein 1 homolog	GVEPSP**S**PIKPGDIK	0.998	2	2.7
Wdr26	WD repeat-containing protein 26	RL**S**QSDEDVIR	1.000	2	2.7

Table 4.3.12: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that were found to be common to CHO BB, CHO NCBI and Swiss-Prot protein databases. (Note: The Swiss-Prot protein database contains sequences for Human, Mouse Rat and CHO, downloaded January 2011)

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
TNKS1BP1	182 kDa tankyrase-1-binding protein	**S**AEEGEVTESK	1.000	2	3.0
PLCB3	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase beta-3	**S**LGEEGLNR	1.000	2	2.6
ANLN	actin-binding protein anillin	SSSASGASASINSSSVQQEATcc**S**PR	1.000	3	5.2
N/A	Alanyl-tRNA synthetase domain-containing protein 1	GAQADHFTQTPL**S**PGSQVQVR	1.000	3	3.8
ATXN2L	Ataxin-2-like protein	EKEVDGLLTSDPMG**S**PVSSK	1.000	3	4.5
ACLY	ATP-citrate synthase-like	TA**S**FSESR	1.000	2	3.2
PRRC2C	BAT2 domain-containing protein 1	SES**S**DFEVVPK	0.992	2	2.5
BCLAF1	bcl-2-associated transcription factor 1	AEGEPQEE**S**PLK	1.000	2	3.0
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SI**S**TVDLTEK	1.000	2	3.2
PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	EDEI**S**PPPPNPVVK	1.000	2	3.0
GPS1	COP9 signalosome complex subunit 1	EG**S**QGELTPANSQSR	1.000	2	3.4
N/A	cyclin-dependent kinase 11-like isoform 1	RD**S**LEEGELR	1.000	2	2.9
PLA2G4A	cytosolic phospholipase A2-like	cSV**S**LSNVEAR	1.000	2	3.0
DNAJC2	dnaJ homolog subfamily C member 2-like	NA**S**TSFQELEDK	1.000	2	3.8
EEF1B2	elongation factor 1-beta-like	DDDDIDLFG**S**DDEEESEEAKR	1.000	3	3.8
EFS	Embryonal Fyn-associated substrate	LP**S**TESLSR	0.997	2	2.6
EIF4G2	eukaryotic translation initiation factor 4 gamma 2-like	TQ**T**PPLGQTPQLGLK	0.999	2	2.4
FNBP1L	Formin-binding protein 1-like	TI**S**DGTISASK	0.998	2	2.9
ALDOA	fructose-bisphosphate aldolase A isoform 1	GILAADESTG**S**IAK	0.993	2	3.6
GPI	glucose-6-phosphate isomerase	SN**S**PIVVDSR	1.000	2	3.2
N/A	glycogen synthase kinase-3 beta-like isoform 2	GEPNVS**Y**IcSR	0.998	2	2.9
HSP90AA1	Heat shock protein HSP 90-alpha	ESDDKPEIEDVG**S**DEEEEEK	1.000	3	5.4
HDGF	Hepatoma-derived growth factor	AGDmLED**S**PK	1.000	2	2.5
HNRNPUL2	Heterogeneous nuclear ribonucleoprotein U-like protein 2	**S**GDETPGSEAPGDK	1.000	2	2.9
KLC2	kinesin light chain 2-like	AS**S**LNFLNK	1.000	2	2.4
BAG6	Large proline-rich protein BAT3	ENA**S**PAPGTTAEEAMSR	1.000	2	2.2
MCMBP	mini-chromosome maintenance complex-binding protein-like	VH**S**PPASLVPR	1.000	2	3.1
MAPK1	mitogen-activated protein kinase 1-like	VADPDHDHTGFLTE**Y**VATR	0.999	3	4.1
MYH9	myosin-9	GTGDc**S**DEEVDGK	1.000	2	2.6
N/A	NGFI-A-binding protein 2 isoform 2	L**S**PLPGGPGAGDPR	1.000	2	2.4
NRBP2	nuclear receptor binding protein	TP**T**PEPAEVETR	1.000	2	2.9
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	EEDEEAE**S**PPEK	1.000	2	2.5

NPM1	Nucleophosmin	GPS**S**VEDIK	1.000	2	3.0
ZDHHC5	probable palmitoyltransferase ZDHHC5	GD**S**LKEPTSIADSSR	1.000	3	3.9
FAM103A1	protein FAM103A1-like	RPPE**S**PPIVEEWNSR	1.000	3	4.4
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	LA**S**TSDIEEK	0.994	2	3.2
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	SG**S**YSYLEER	0.991	2	2.8
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	DDSLDL**S**PQGR	0.998	2	2.4
RANBP1	ran-specific GTPase-activating protein-like	FA**S**ENDLPEWK	1.000	2	2.5
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	DVEDmEL**S**DVEDDGSK	1.000	2	2.6
RSF1	Remodeling and spacing factor 1	IE**S**DEEEDFENVGK	1.000	2	3.1
N/A	ribosomal protein S27-like, isoform CRA_a	LTEGc**S**FR	1.000	2	2.5
SEPT2	Septin-2	IYHLPDAE**S**DEDEDFK	1.000	3	3.8
SEPT8	Septin-7	IYEFPE**T**DDEEENK	1.000	2	2.3
PAK2	serine/threonine-protein kinase PAK 2-like	YL**S**FTPPEK	1.000	2	2.6
SPTAN1	Spectrin alpha chain, brain	**S**LQQLAEER	1.000	2	3.1
SPTBN1	spectrin beta chain, brain 1 isoform 1	GDQVSQNGLPAEQG**S**PR	1.000	3	4.4
TPX2	targeting protein for Xklp2	SSELPLTVPV**S**PK	1.000	2	2.9
THRAP3	thyroid hormone receptor-associated protein 3-like	ASVSDL**S**PR	1.000	2	2.6
USP10	Ubiquitin carboxyl-terminal hydrolase 10	c**S**PPVPSPLASEK	1.000	2	2.9
UCHL1	ubiquitin carboxyl-terminal hydrolase 1-like	VEESSEI**S**PEPK	0.999	2	2.9
UFD1L	ubiquitin fusion degradation protein 1 homolog	FVAFSGEGQ**S**LR	1.000	2	4.7
C12orf45	Uncharacterized protein C12orf45-like	IEVLD**S**PASK	1.000	2	2.7
KIAA1522	Uncharacterized protein KIAA1522	LQLERPV**S**PEAQADLQR	1.000	3	4.9
VPS4B	Vacuolar protein sorting-associated protein 4B	GND**S**DGEAESDDPEK	1.000	2	3.3
WIPI2	WD repeat domain phosphoinositide-interacting protein 2	GAYVPS**S**PTR	0.992	2	2.9

Table 4.3.13: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that were found to be common to CHO BB and CHO NCBI protein databases.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
TNKS1BP1	182 kDa tankyrase-1-binding protein	mQAGSQ**S**PSNVDLEDK	0.991	2	2.6
TNKS1BP1	182 kDa tankyrase-1-binding protein	TEAQDPcRV**S**PEPTGPER	1.000	3	3.8
PSMD9	26S proteasome non-ATPase regulatory subunit 9-like	LGSN**S**PVLPQAFAK	0.999	2	3.2
ANKRD17	ankyrin repeat domain-containing protein 17-like	NSPLDcGAA**S**PNK	1.000	2	2.8
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SQ**S**PSPPSLSEDLEK	0.999	2	2.6
RERE	Arginine-glutamic acid dipeptide repeats protein	VA**S**DTEEPDR	1.000	2	3.2
ATN1	Atrophin-1	SEEV**S**ESESEETSAPK	1.000	2	2.6
EPB41L2	Band 4.1-like protein 2	EVTENEQNQL**S**EPEEGK	1.000	3	4.4
EPB41L2	Band 4.1-like protein 2	GSQPGPAVESQS**S**PR	1.000	2	3.7
BCL10	B-cell lymphoma/leukemia 10	GLQcSScEPFAAGATNNL**S**R	1.000	3	5.2
BCL10	B-cell lymphoma/leukemia 10	SN**S**EESNLSEK	1.000	2	3.0
SPAG9	C-jun-amino-terminal kinase-interacting protein 4	NVSTD**S**VENEEK	0.998	2	3.3
CSDE1	cold shock domain-containing protein E1-like, partial	NI**S**LDDASAPR	1.000	2	4.1
MCM3	DNA replication licensing factor MCM3	KKPSEDE**S**DLEDEEEK	1.000	3	4.1
EEF1D	Elongation factor 1-delta	KAATPAEDDEDDDIDLFG**S**DEEEEDKEAAR	1.000	4	5.9
EPS15L1	epidermal growth factor receptor substrate 15-like	LD**S**SDPFK	0.998	2	3.0
ESF1	ESF1-like	IGSEI**S**PK	1.000	2	2.5
EIF3C	Eukaryotic translation initiation factor 3 subunit C	RPLLL**S**EDEEDTKR	1.000	3	3.8
FNBP1L	Formin-binding protein 1	TV**S**ENSLSSSK	0.999	2	2.2
FNBP4	Formin-binding protein 4	VDEN**S**DKEAEVEESSEK	1.000	3	5.4
GTF2F1	general transcription factor IIF subunit 1	MDAAPQSL**S**GK	0.993	2	3.4
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	GGM**S**PANDTGAK	1.000	2	2.6
DKC1	H/ACA ribonucleoprotein complex subunit 4	TVLESGGEAGDGD**S**DTTK	1.000	2	3.1
HNRNPD	Heterogeneous nuclear ribonucleoprotein D0	FGEVVDc**T**IK	1.000	2	2.7
HIRIP3	HIRA-interacting protein 3	SPAPc**S**DPER	1.000	2	2.5
KAT7	Histone acetyltransferase MYST2	SQQQPNPV**T**PK	1.000	2	2.5
DBR1	Lariat debranching enzyme	SGETVE**S**GDEKDLSEFPVK	1.000	3	4.7
LMO7	LIM domain only protein 7	SR**S**TTELNDAATEK	0.991	2	3.0
KDM2A	Lysine-specific demethylase 2A	GDEEGLGGEEEEEEEEEDD**S**AEEGGAAR	1.000	3	4.4
TRMT1	N(2),N(2)-dimethylguanosine tRNA methyltransferase	VSENL**S**EQEEEK	1.000	2	2.8
N/A	nuclease domain-containing protein 1	AA**S**PATETVPAFSER	1.000	2	3.3
PSIP1	PC4 and SFRS1-interacting protein	AADIT**T**PK	0.996	2	2.3

PI4KB	phosphatidylinositol 4-kinase beta isoform 1	TA**S**NPKVENEDEPVR	1.000	3	4.0
DEK	protein DEK-like	DE**S**EEEEDDDEDEDEEEEKEK	1.000	3	3.9
FAM172A	protein FAM172A-like, partial	QL**S**ADGTDEPAEK	1.000	2	2.2
RIN2	Ras and Rab interactor 2	QA**S**FLEAEGSAK	1.000	2	2.7
N/A	Ras-associated and pleckstrin-likey domains-containing protein 1	TA**S**AGTVSDAEVR	1.000	2	3.8
RBBP6	Retinoblastoma-binding protein 6	VEGAEIVKP**S**PK	1.000	2	2.4
ARHGAP18	Rho GTPase-activating protein 18	VNDASLP**S**FR	1.000	2	3.1
RPUSD2	RNA pseudouridylate synthase domain-containing protein 2	IAEAPSQDLD**T**PEK	1.000	2	2.5
SASH1	SAM and SH3 domain-containing protein 1	SH**S**LDDLQGEADAGK	0.994	2	3.1
PKN2	Serine/threonine-protein kinase N2	AS**S**LGEIDESSEVR	0.996	2	3.8
SCNM1	sodium channel modifier 1-like isoform 1	ESSDLLASAPI**S**PTK	0.999	2	2.6
SART3	Squamous cell carcinoma antigen recognized by T-cells 3	cVTIDVA**S**PSK	0.999	2	3.1
RIF1	Telomere-associated protein RIF1	SHEDEIS**S**PVNK	0.999	2	3.5
RIF1	Telomere-associated protein RIF1	SSD**S**VDIGEQEEK	1.000	2	3.6
THRAP3	thyroid hormone receptor-associated protein 3-like	GSF**S**DADVK	1.000	2	2.8
TFDP1	transcription factor Dp-1 isoform 1	VFIDQNL**S**PGK	1.000	2	2.5
USP15	ubiquitin carboxyl-terminal hydrolase 15-like	**S**PGASNFSALPK	1.000	2	2.9
WAPAL	wings apart-like protein homolog	SE**S**PSEScPVK	1.000	2	2.9
ZNF438	zinc finger protein 828	cDSVVQEGLLA**T**PK	1.000	2	3.6

Table 4.3.14: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that were found to be common to CHO BB and Swiss-Prot protein databases. (Note: The Swiss-Prot protein database contains sequences for Human, Mouse Rat and CHO, downloaded January 2011)

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
PDAP1	28 kDa heat- and acid-stable phosphoprotein	SLDSDE**S**EDEDDDYQQK	1.000	2	2.5
PRKAR2B	cAMP-dependent protein kinase type II-beta regulatory subunit	RA**S**VcAEAYNPDEEEDDAESR	1.000	3	6.1
AHNAK	Neuroblast differentiation-associated protein AHNAK	GGVTG**S**PEASISGSK	1.000	2	3.8
UGDH	UDP-glucose 6-dehydrogenase	RIPY**T**PGEIPK	0.995	2	3.0
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	YNLDA**S**EEEDSNK	1.000	2	3.1

Table 4.3.15: List of phosphopeptides identified following LC/MS analysis of an Iron phosphopeptide enriched sample of a temperature shifted CHO SEAP whole cell lysate taken down 36 hours post temperature shift that were found to be common to CHO NCBI and Swiss-Prot protein databases. (Note: The Swiss-Prot protein database contains sequences for Human, Mouse Rat and CHO, downloaded January 2011)

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Charge	XCorr
AFAP1	actin filament-associated protein 1 isoform 1	SGTSSPQ**S**PVFR	1.000	2	2.6
BRD3	bromodomain-containing protein 3 isoform 1	SE**S**PPPLSEPK	1.000	2	2.4
CLIP1	CAP-Gly domain-containing linker protein 1	TASESISNL**S**EAGSVK	0.999	2	3.0
PCYT1A	Choline-phosphate cytidylyltransferase A	mLQAI**S**PR	1.000	2	2.4
DPYSL2	dihydropyrimidinase-related protein 2-like	GLYDGPVcEVSV**T**PK	1.000	2	2.8
POLD3	DNA polymerase delta subunit 3	VDL**S**DEEAK	1.000	2	3.1
HUWE1	E3 ubiquitin-protein ligase HUWE1	GSGTA**S**DDEFENLR	1.000	2	2.6
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	EATLPPV**S**PPK	1.000	2	2.9
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	SF**S**KEVEER	1.000	2	2.4
EIF5B	eukaryotic translation initiation factor 5B-like	WDG**S**EEDEDNSK	1.000	2	4.6
FLNA	Filamin-A	cSGPGL**S**PGMVR	1.000	2	2.9
FOXK1	forkhead box protein K1-like	SSGLQTPEcL**S**R	1.000	2	2.6
AGPAT9	glycerol-3-phosphate acyltransferase 3	NSA**S**VGIIQR	0.999	2	2.8
HSP90AB1	heat shock protein HSP 90-beta-like	IEDVG**S**DEEDDSGK	1.000	2	3.6
KMT2D	Histone-lysine N-methyltransferase MLL2	LcPQPEEPYL**S**PQPEEPR	1.000	3	4.1
IRF2BPL	interferon regulatory factor 2-binding protein-like	KA**S**PEPPDSAESALK	1.000	2	2.3
LMNA	Lamin-A/C	SGAQASSTPL**S**PTR	0.993	2	3.8
BAG6	Large proline-rich protein BAT3	LQEDPNY**S**PQR	1.000	2	3.2
MAP1A	Microtubule-associated protein 1A	cL**S**PDDSTVK	1.000	2	2.8
TOMM34	Mitochondrial import receptor subunit TOM34	VP**S**AGDVER	1.000	2	2.9
MEF2A	myocyte-specific enhancer factor 2A isoform 2	GcD**S**PDPDTSYVLTPHTEEK	1.000	3	4.8
NOLC1	Nucleolar phosphoprotein p130	VADN**S**FDAK	1.000	2	3.4
NOP14	nucleolar protein 14	FGEYNSNI**S**PEEK	1.000	2	2.5
PALLD	palladin-like	IA**S**DEEIQGTK	1.000	2	3.0
PSMA3	Proteasome subunit alpha type-3	ESLKEEDE**S**DDDNM	1.000	2	3.5
SCRIB	Protein scribble-like	N**S**LESISSIDR	1.000	2	3.3
RAB11FIP5	Rab11 family-interacting protein 5	TY**S**DEASQLR	1.000	2	2.9
ARHGEF7	rho guanine nucleotide exchange factor 7-like	KP**S**DEEFAVR	1.000	2	2.8
RBM39	RNA-binding protein 39 isoform a	DK**S**PVREPIDNLTPEER	1.000	3	4.7
SASH1	SAM and SH3 domain-containing protein 1	AGG**S**VESLR	0.996	2	2.9

TLN2	Talin-2	LDEG**T**PPEPK	1.000	2	2.7
JUN	transcription factor AP-1-like	LA**S**PELER	1.000	2	2.3
KIAA1522	Uncharacterized protein KIAA1522	GLAGPPA**S**PGK	1.000	2	3.1
ZFR	Zinc finger RNA-binding protein	RRD**S**DGVDGFEAEGK	1.000	3	4.0

Table 4.3.16: Symbols denoting the amino acids Serine, Tyrosine and Threonine.

Amino Acid	Symbol
Serine	S
Tyrosine	Y
Threonine	T

Table 4.3.17: List of phosphopeptides identified following LC/MS analysis of Iron phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be common to CHO BB and CHO NCBI protein databases.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
TNKS1BP1	182 kDa tankyrase-1-binding protein	RD**S**LLDIR	1.000	1	2	2.8	
TNKS1BP1	182 kDa tankyrase-1-binding protein	KEIPA**S**PDR	1.000	1	2	2.8	
TNKS1BP1	182 kDa tankyrase-1-binding protein	DTGQLEEGESGGLL**S**PSmPK	0.999	1	2	3.0	
TNKS1BP1	182 kDa tankyrase-1-binding protein	VP**SS**DEEVVEEPQSR	1.000	2	2	4.3	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	MQAGSQ**S**PSNVDLEDK	0.999	1	2	5.0	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	TEAQDPcRV**S**PEPTGPER	1.000	1	3	4.1	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	NR**S**AEEGEVTESK	1.000	1	3	4.9	*
PLCB3	1-phosphatidylinositol-4,5-bisphosphate phosphodiesterase beta-3	**S**LGEEGLNR	1.000	1	2	2.5	*
PSMD2	26S proteasome non-ATPase regulatory subunit 2	FGG**S**GSQVDSAR	0.999	1	2	3.2	*
PSMD2	26S proteasome non-ATPase regulatory subunit 2	DK**T**PVQSQQPSATAPAGADEK	1.000	1	3	4.4	
PSMD9	26S proteasome non-ATPase regulatory subunit 9-like	LGSN**S**PVLPQAFAK	1.000	1	2	3.8	*
RPS27	40S ribosomal protein S27	DLLHP**S**PEEEK	1.000	1	2	3.0	*
XRN2	5'-3' exoribonuclease 2-like	AED**S**D**S**EPEPEDNVR	1.000	2	2	2.9	*
RPL12	60S ribosomal protein L12	IGPLGL**S**PK	1.000	1	2	3.0	
RPL14	60S ribosomal protein L14	AAILKA**S**PK	1.000	1	2	2.2	
RPL4	60S ribosomal protein L4	ILK**S**PEIQR	1.000	1	2	2.3	
ANLN	actin-binding protein anillin	EPLSEASNQQPL**S**GGEEK	1.000	1	2	2.6	
ANLN	actin-binding protein anillin	EIEM**S**VDDDDINSSK	1.000	1	2	3.1	
ANLN	actin-binding protein anillin	SSSASGASASINSSSVQQEATccS**S**PR	1.000	1	3	4.9	
AMBRA1	activating molecule in BECN1-regulated autophagy protein 1	LELSSSA**S**PQEER	1.000	1	2	3.5	*
AHSA2	Activator of 90 kDa heat shock protein ATPase-like 2	VTGNPLQA**S**PVALGVR	1.000	1	2	3.5	
ADNP	activity-dependent neuroprotector homeobox protein-like	LNQ**S**PGLAPVK	1.000	1	2	3.1	
ARL6IP4	ADP-ribosylation factor-like protein 6-interacting protein 4	**S**AGEDDGPVLTDEQK	1.000	1	2	3.6	*
MLLT4	Afadin	TI**S**NPEVVMK	1.000	1	2	2.6	
MLLT4	Afadin	TS**S**VVTLEVAK	0.993	1	2	3.9	
AKAP1	A-kinase anchor protein 1, mitochondrial-like	LPKPD**S**LQNVQASSNPK	1.000	1	3	4.2	*
AKAP12	A-kinase anchor protein 12	GLSEAQQEGEAEEGAT**S**DGEK	0.991	1	2	4.9	*
AMPD2	AMP deaminase 2	TD**S**DSDLQLYK	0.995	1	2	3.8	*

ZFAND5	AN1-type zinc finger protein 5-like	M**S**PMGTASGSNSPTSDSASVQR	0.997	1	2	4.6	*
ANKIB1	ankyrin repeat and IBR domain-containing protein 1	GVAPAD**S**PDAPR	1.000	1	2	2.6	
ANKRD17	ankyrin repeat domain-containing protein 17-like	NSPLDcGAA**S**PNK	1.000	1	2	2.6	
ANKRD17	ankyrin repeat domain-containing protein 17-like	AP**S**PASSSVPLGSEKPSNVSQDR	1.000	1	3	4.1	
AP3B1	AP-3 complex subunit beta-1	NFYE**S**DDEEKEK	0.997	1	2	2.4	
AP3D1	AP-3 complex subunit delta-1 isoform 1	HSSLP**T**E**S**DEDIAPAQR	1.000	2	2	2.9	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	TAQVP**S**PPR	1.000	1	2	2.2	
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	GL**S**PLSSTLDTK	1.000	1	2	2.4	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SQ**S**PSPPSLSEDLEK	0.991	2	2	2.6	
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SSFSEEKGE**S**DDEKPR	1.000	1	2	2.8	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	HL**S**QTEPEQK	1.000	1	2	3.1	*
AGFG1	Arf-GAP domain and FG repeats-containing protein 1	GTPSQ**S**PVVGR	0.999	1	2	2.5	
ACAP2	Arf-GAP with coiled-coil, ANK repeat and PH domain-containing protein 2	SSPSTG**S**LDSGNESK	0.999	1	2	3.7	
ASAP2	arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2-like, partial	LLHEDLDE**S**DDDVDEK	1.000	1	2	4.6	*
RERE	Arginine-glutamic acid dipeptide repeats protein	TQEISRPN**S**PSEGEGESSDSR	0.990	2	3	4.6	
PEA15	astrocytic phosphoprotein PEA-15	DIIRQP**S**EEEIIK	1.000	1	2	2.2	*
ATXN2L	Ataxin-2-like protein	EVDGLLTSDPMG**S**PVSSK	1.000	1	2	5.2	*
ABCF1	ATP-binding cassette sub-family F member 1-like	AV**S**EEQQPGLR	1.000	1	2	2.8	*
ACLY	ATP-citrate synthase-like	AKPAMPQDSVP**S**PR	1.000	1	2	2.3	*
DDX18	ATP-dependent RNA helicase DDX18	KLPQKPTTLTNGETAATP**S**PDSEPK	1.000	1	3	4.4	*
DDX24	ATP-dependent RNA helicase DDX24	KL**S**PSQSTVSK	0.991	1	2	2.2	
DDX54	ATP-dependent RNA helicase DDX54	IDDRD**S**EDEGSFNQR	1.000	1	3	5.1	*
ARID1A	AT-rich interactive domain-containing protein 1A	TLLDPGRF**S**K	1.000	1	2	2.2	
ARID5B	AT-rich interactive domain-containing protein 5B	AV**S**PLDPAK	1.000	1	2	2.5	
ATN1	Atrophin-1	SEEV**S**ESESEETSAPK	0.999	1	2	3.8	*
BAG3	BAG family molecular chaperone regulator 3	**S**PENEDPQTESQQPEAK	1.000	1	2	2.9	
EPB41L2	Band 4.1-like protein 2	GSQPGPAVESQS**S**PR	0.993	1	2	2.5	
EPB41L2	Band 4.1-like protein 2	EVTENEQNQL**S**EPEEGK	1.000	1	2	3.8	*
BSG	Basigin	KPDQ**T**LDEDDPGAAPLK	1.000	1	3	3.9	
BCL6B	B-cell CLL/lymphoma 6 member B protein	VYEDSGVPLPTE**S**PK	1.000	1	2	2.5	
BCLAF1	bcl-2-associated transcription factor 1	IDI**S**PSALR	1.000	1	2	2.5	
BCLAF1	bcl-2-associated transcription factor 1	AEGEPQEE**S**PLK	1.000	1	2	3.2	
BET1	BET1 homolog	SL**S**IEIGHEVK	1.000	1	2	2.8	*

BOD1L1	Biorientation of chromosomes in cell division protein 1-like	RG**S**ISQEITK	1.000	1	2	2.7	*
CDCA8	borealin-like	LTAEAIQ**T**PLK	1.000	1	2	2.9	
CDCA8	borealin-like	EQIYNVSING**S**PLADSK	1.000	1	2	4.9	*
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SI**S**TVDLTEK	0.990	1	2	2.7	
BRAP	BRCA1-associated protein	QSESVNTAPD**S**PSK	1.000	1	2	3.1	
BRCA1	Breast cancer type 1 susceptibility protein-like	RA**S**DPFPEEK	1.000	1	2	2.7	*
BAZ1A	bromodomain adjacent to zinc finger domain protein 1A	DLDPDMV**T**EDEDDPGSQR	1.000	1	2	3.4	
BAZ2A	Bromodomain adjacent to zinc finger domain protein 2A	ELTGPDTPA**S**PAR	1.000	1	2	2.9	
BUD13	BUD13-like	HD**S**PDLELPR	1.000	1	2	2.2	*
BUD13	BUD13-like	ND**T**PDP**S**PPR	1.000	2	2	2.4	*
BUD13	BUD13-like	RAHHD**T**PDP**S**PR	1.000	2	2	2.4	*
BUD13	BUD13-like	HD**T**PDP**S**PPR	1.000	2	2	2.5	*
CAD	CAD protein isoform 1	A**S**DPGLPAEEPK	1.000	1	2	2.2	*
CARHSP1	calcium-regulated heat stable protein 1-like	DR**S**PSPLR	1.000	1	2	2.4	
PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	EDEI**S**PPPPNPVVK	1.000	1	2	2.6	
CAT	Catalase	**S**LQKPDVLTTGGGNPIGDK	1.000	1	2	2.2	*
CEBPZ	CCAAT/enhancer-binding protein zeta	NEDED**S**IEDVDDKEFEK	1.000	1	2	5.2	*
CNOT2	CCR4-NOT transcription complex subunit 2-like	TNSMSSSGLG**S**PNR	1.000	1	2	3.3	*
CD44	CD44 antigen	**S**QEMVHLVNK	1.000	1	2	2.5	*
CDC42EP1	Cdc42 effector protein 1	RSD**S**LLSFR	1.000	1	2	3.1	*
CDC42EP2	cdc42 effector protein 2-like	LHLE**S**PQP**S**PK	1.000	2	2	3.3	*
N/A	Cell division cycle 2-related protein kinase 7	NS**S**PAPPQPAPVK	0.996	1	2	2.5	
N/A	Cell division cycle 2-related protein kinase 7	DSKG**S**PITLTK	0.990	1	2	2.8	
CDK3	Cell division protein kinase 3	IGEGT**Y**GVVYK	0.997	1	2	3.3	
CEP170	Centrosomal protein of 170 kDa	LGEA**S**DSELADADK	1.000	1	2	5.0	*
CBX5	chromobox protein homolog 5	KS**S**FSNSADDIK	0.997	1	2	4.3	*
CDYL	chromodomain Y-like protein-like	ILVPK**S**PVK	1.000	1	2	2.3	
KIF4A	Chromosome-associated kinesin KIF4	NQ**S**LVEENEK	1.000	1	2	2.8	*
CPSF7	cleavage and polyadenylation specificity factor subunit 7 isoform 1	DSSDSADGRA**T**PSENLVPSSAR	0.999	1	3	4.3	
CCDC86	coiled-coil domain-containing protein 86-like	VQPLET**S**PG**S**PcLK	0.992	2	2	2.2	
CCDC86	coiled-coil domain-containing protein 86-like	QEAGFG**S**PQR	1.000	1	2	2.2	
CSDE1	cold shock domain-containing protein E1-like, partial	NI**S**LDDASAPR	1.000	1	2	3.0	*
NCAPG	Condensin complex subunit 3	AIQcEDEEIN**S**DDEQEAK	1.000	1	2	4.2	*
NCAPD3	Condensin-2 complex subunit D3	SLGALPFSVESG**S**PEK	1.000	1	2	3.2	*

GPS1	COP9 signalosome complex subunit 1	EGSQGEL**T**PANSQSR	1.000	1	2	3.2	
COBLL1	Cordon-bleu protein-like 1	EQTA**S**APATPLVSK	1.000	1	2	2.3	
SPRR1A	cornifin-A-like	APEPcHPVVPEPcPSNV**T**PEPcQQK	1.000	1	3	6.1	*
CTTNBP2NL	CTTNBP2 N-terminal-like protein	DL**S**PTLLDNSAAK	0.995	1	2	2.7	
ATF2	cyclic AMP-dependent transcription factor ATF-2 isoform 1	NDSVIVADQ**T**P**T**PTR	0.999	2	2	3.3	*
N/A	cyclin-dependent kinase 11-like isoform 1	RD**S**LEEGELR	1.000	1	2	2.4	*
CDK16	cyclin-dependent kinase 16	RV**S**LSEIGFGK	0.993	1	2	2.4	*
CDK17	cyclin-dependent kinase 17	RI**S**mEDLNK	1.000	1	2	2.6	*
CCNK	Cyclin-K	KP**S**PQP**S**PPR	1.000	2	2	2.7	*
CCNK	Cyclin-K	TVVV**S**PKEENK	1.000	1	2	3.7	*
CCNL1	Cyclin-L1	AEEK**S**PISINVK	0.999	1	2	3.0	*
CCNL2	Cyclin-L2	TD**S**PVNGLPK	1.000	1	2	2.5	
DYNC1LI1	Cytoplasmic dynein 1 light intermediate chain 1	KPASV**S**PTTPTSPTEGEAS	0.995	1	2	2.8	
PLA2G4A	cytosolic phospholipase A2-like	HIVSNDSSD**S**DDEAQAPK	0.999	1	2	4.3	*
DCAF8	DDB1- and CUL4-associated factor 8-like	VHDH**S**EEEEEEQPLHR	1.000	1	3	4.2	*
DOCK1	Dedicator of cytokinesis protein 1	**S**QVINVIGSER	1.000	1	2	2.5	
DOCK7	dedicator of cytokinesis protein 7	SM**S**IDDTPR	1.000	1	2	2.7	
DTL	Denticleless protein-like	AGLVMVASSQT**T**PAK	0.990	1	2	2.4	
DAB2	Disabled-like 2	**S**ADNSLENPFSK	1.000	1	2	3.7	
DNMT1	DNA (cytosine-5)-methyltransferase 1	EADDDEEVDDDIPEVP**S**PK	1.000	1	2	3.1	
DNMT1	DNA (cytosine-5)-methyltransferase 1	EAESEQMTLE**S**AEDG**S**EEEEREEK	1.000	2	3	4.8	
LIG1	DNA ligase 1	HAEASK**S**PESGTLTK	0.999	1	3	4.2	*
LIG1	DNA ligase 1-like	AAQVL**SS**EGEEEDEAPSTPK	1.000	2	3	3.9	*
LIG3	DNA ligase 3 isoform 2	VTTTGQVS**S**PVK	1.000	1	2	3.4	
MSH6	DNA mismatch repair protein Msh6	DNP**S**E**S**EEELQPK	1.000	2	2	2.8	
MCM2	DNA replication licensing factor MCM2	ISDPLT**SS**PGR	0.995	2	2	2.7	*
MCM2	DNA replication licensing factor MCM2	GLLYD**S**DEEDEERPAR	1.000	1	2	3.6	*
MCM3	DNA replication licensing factor MCM3	KP**S**EDE**S**DLEDEEEK	1.000	1	2	3.0	
MCM7	DNA replication licensing factor MCM7	SEDDAAEAGEL**S**GEELK	1.000	1	2	2.5	*
TOPBP1	DNA topoisomerase 2-binding protein 1	NTSTLSA**S**PQLK	1.000	1	2	2.6	
TWISTNB	DNA-directed RNA polymerase I subunit RPA43	HREEIDSA**S**PK	1.000	1	2	2.3	*
DNAJC2	dnaJ homolog subfamily C member 2-like	NA**S**TSFQELEDK	0.995	1	2	3.5	
DBN1	Drebrin	**S**PSDSSTASTPVTEQIER	0.993	1	2	3.3	*
DBNL	drebrin-like protein isoform 1	QL**T**QPEVSYGR	1.000	1	2	2.3	
DNM1L	dynamin-1-like protein-like	SKPIPIMPA**S**PQK	1.000	1	2	3.0	*
RNF20	E3 ubiquitin-protein ligase BRE1A	ALVVPEPEPDSD**S**NQER	0.997	1	2	3.6	
NEDD4	E3 ubiquitin-protein ligase NEDD4	QI**S**EEVDSADNR	1.000	1	2	3.0	
PJA1	E3 ubiquitin-protein ligase Praja-1 isoform 1	ARD**S**EEEGAGPVDR	1.000	1	2	3.7	*

TOPORS	E3 ubiquitin-protein ligase Topors	LQQNVPADA**S**PDSK	1.000	1	2	2.5	*
EEF1B2	elongation factor 1-beta-like	YGPA**S**VEDTTGSGTADAK	1.000	1	2	3.3	*
EEF1D	Elongation factor 1-delta	ATAPQTQHV**S**PmR	0.999	1	2	2.4	*
EEF2	Elongation factor 2	IMGPNY**T**PGKK	0.998	1	2	3.3	
EFS	Embryonal Fyn-associated substrate	LP**S**TESLSR	0.992	1	2	2.7	
EDC3	enhancer of mRNA-decapping protein 3-like	SQDVAV**S**PQQQQcSK	1.000	1	2	4.5	*
EPS15L1	epidermal growth factor receptor substrate 15-like	LD**S**SDPFK	0.996	1	2	2.5	
ESF1	ESF1-like	IGSEI**S**PK	1.000	1	2	2.4	
ESF1	ESF1-like	DSSTSEIVK**S**PTAAcSK	0.998	1	2	2.7	*
ESF1	ESF1-like	DSL**SS**EEEADLEK	1.000	2	2	4.6	*
EIF2S1	eukaryotic translation initiation factor 2 subunit 1-like	ENAEVDGDDD**T**EEMEAK	1.000	1	2	3.5	
EIF3A	eukaryotic translation initiation factor 3 subunit A-like	LE**S**LNIQR	1.000	1	2	2.8	
EIF3C	Eukaryotic translation initiation factor 3 subunit C	RPLLL**S**EDEEDTK	1.000	1	2	3.0	*
EIF3J	eukaryotic translation initiation factor 3 subunit J-like	VL**T**PEEQLADK	1.000	1	2	2.7	
EIF4G2	eukaryotic translation initiation factor 4 gamma 2-like	TQ**T**PPLGQTPQLGLK	0.992	1	2	3.0	
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	TS**S**PTTLAPLAR	0.999	1	2	3.1	
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PVAATVVQR	1.000	1	2	3.9	*
FASN	fatty acid synthase	LGML**S**PEGTcK	0.999	1	2	2.3	*
FBXO28	F-box only protein 28	EVMESAVGTSSGSGQSEE**S**PR	1.000	1	2	3.7	
FOXK2	Forkhead box protein K2	EG**S**PAPVEPEPGAAQPK	1.000	1	2	3.5	
FNBP4	Formin-binding protein 4	ALEEGDGSVSGS**S**PR	0.996	1	2	4.3	
FNBP4	Formin-binding protein 4	VDEN**S**DKEAEVEESSEK	1.000	1	3	4.8	*
ALDOA	fructose-bisphosphate aldolase A isoform 1	LQ**S**IGTENTEENR	0.993	1	2	2.5	
AP1AR	Gamma1-adaptin brefeldin A resistance protein	SK**T**EEDILR	0.993	1	2	2.4	*
GCFC2	GC-rich sequence DNA-binding factor-like isoform 1	EGQNIDL**S**PK	1.000	1	2	2.8	
SLC35C1	GDP-fucose transporter 1	MALTGG**S**TASEEADEDSR	0.994	1	2	3.7	*
GTF3C4	general transcription factor 3C polypeptide 4	ILLVD**S**PGMGDGEDEQQEEGTSK	1.000	1	2	2.7	
GTF2F1	general transcription factor IIF subunit 1	MDAAPQSL**S**GK	0.993	1	2	2.6	
GPHN	Gephyrin	ASH**S**AVDITK	1.000	1	2	2.5	
GPN1	GPN-loop GTPase 1	GTLDEEDEEAE**S**DTDDIDHR	0.999	1	3	4.1	*
GAPVD1	GTPase-activating protein and VPS9 domain-containing protein 1	SR**S**SDIVSSVR	0.997	1	2	3.1	*
DKC1	H/ACA ribonucleoprotein complex subunit 4	TVLE**S**GGEAGDGD**S**DTTK	0.998	2	2	5.2	*
HEATR3	HEAT repeat-containing protein 3	EcSTGLDSNEM**S**PQEK	1.000	1	2	3.3	*
HSPA4	Heat shock 70 kDa protein 4	HAEQNGPVDGQGD**S**PGPQAAEQGADTAVPSDADK	1.000	1	3	5.0	
HSP90AA1	Heat shock protein HSP 90-alpha	ESDDKPEIEDVG**S**DEEEEEK	1.000	1	2	2.2	*
HN1L	Hematological and neurological expressed 1-like protein	G**S**GIFDESTPVQTR	1.000	1	2	2.5	
HGSNAT	Heparan-alpha-glucosaminide N-acetyltransferase	LINSELG**S**PSR	0.995	1	2	3.0	*

MET	Hepatocyte growth factor receptor	DLG**S**ELVR	1.000	1	2	2.5	
HDGF	Hepatoma-derived growth factor	AGDMLED**S**PK	1.000	1	2	2.9	*
HDGF	Hepatoma-derived growth factor	GNAEG**SS**DEEGKLVIDEPAK	1.000	2	3	4.1	*
HDGFRP2	Hepatoma-derived growth factor-related protein 2	SEGI**S**LDR	1.000	1	2	2.4	
HNRNPCL1	Heterogeneous nuclear ribonucleoprotein C-like 1	NEK**S**EEEQSSASVK	1.000	1	2	3.4	*
HNRNPC	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 1	QADL**S**FSSPVEMK	1.000	1	2	2.8	
HNRNPCL1	heterogeneous nuclear ribonucleoprotein C-like 1-like isoform 5	MESEAGADD**S**AEEGDLLDDDDNEDR	1.000	1	3	4.9	
HNRNPH1	Heterogeneous nuclear ribonucleoprotein H	HTGPN**S**PDTANDGFVR	1.000	1	2	2.5	*
KAT7	Histone acetyltransferase MYST2	SQQQPNPV**T**PK	1.000	1	2	3.1	
Q13547	histone deacetylase 1-like	IAcEEEF**S**D**S**DEEGEGGRK	1.000	2	3	3.9	*
HDAC6	Histone deacetylase 6	MTNPV**S**PMGVTTPK	0.991	1	2	2.4	
HDAC6	Histone deacetylase 6	QTTEA**S**PIQGATAQQAPDQLTGR	1.000	1	3	4.8	
H3F3A	Histone H3.3	DSTVPVESD**T**DDEGAPR	0.994	1	2	2.9	
EZH2	histone-lysine N-methyltransferase EZH2 isoform 1	ESSVIAPVPTEDVD**T**PPR	0.990	1	2	2.7	
KMT2D	Histone-lysine N-methyltransferase MLL2	ASQVEPQ**S**PGLGLR	1.000	1	2	2.5	
SETD2	histone-lysine N-methyltransferase SETD2-like	KLDE**S**PILK	1.000	1	2	2.4	*
SETD2	histone-lysine N-methyltransferase SETD2-like	MDTGDTFPTTEES**S**PPK	0.999	1	2	3.0	
SETD2	histone-lysine N-methyltransferase SETD2-like	LPT**S**EPEADTEAELK	0.995	1	2	3.1	
Htatsf1	HIV Tat-specific factor 1-like	mD**S**VSASEQAGPSR	1.000	1	2	3.6	
Htatsf1	HIV Tat-specific factor 1-like	LYEDD**S**DKELEENGVK	1.000	1	2	3.8	*
HYPK	huntingtin-interacting protein K	KHD**S**GAADLER	1.000	1	2	2.5	*
N/A	hypothetical protein I79_015376	KQI**T**VEELVR	1.000	1	2	3.2	*
N/A	hypothetical protein I79_015376	SSSVGSSSSYPI**S**PAVSR	1.000	1	2	3.7	
N/A	hypothetical protein I79_019528	RT**S**DSAFQPK	0.993	1	2	2.3	*
N/A	hypothetical protein I79_019528	DTGGPAEGVEALAM**S**PQQPQR	1.000	1	3	4.5	
N/A	hypothetical protein LOC100760903	TQQ**S**LEPEPK	0.999	1	2	3.4	*
N/A	hypothetical protein LOC100773692	DIKEE**S**DEEDDDDEESGR	1.000	1	3	5.1	*
KPNA2	importin subunit alpha-2	NVSSFPDDAT**S**PLQENR	0.994	1	2	3.1	
KPNA4	importin subunit alpha-3	NVPQEESLED**S**DVDADFK	1.000	1	2	3.5	
RHBDF2	inactive rhomboid protein 2	SV**S**LQEPR	0.996	1	2	2.4	
IKBKB	inhibitor of nuclear factor kappa-B kinase subunit beta-like	GPVSG**S**PDSMNVSR	0.999	1	2	2.8	*
IMPDH2	inosine-5'-monophosphate dehydrogenase 2	GMG**S**LDAMDK	1.000	1	2	2.2	
IRF2BPL	interferon regulatory factor 2-binding protein-like	NSS**S**PV**S**PASVPGQR	0.992	2	2	2.6	
SLC4A1AP	Kanadaptin	MLGED**S**DEEEETDTTEGK	1.000	1	2	5.4	*
KTN1	kinectin	EIQNGAIHE**S**DSENVLR	0.998	1	2	2.3	*
KLC1	Kinesin light chain 1	VD**S**PTVTTTLK	1.000	1	2	2.4	

KLC2	kinesin light chain 2-like	AS**S**LNFLNK	0.995	1	2	2.8	
KIF15	Kinesin-like protein KIF15	GLQGF**S**PK	1.000	1	2	2.3	*
KIF27	Kinesin-like protein KIF27	IILDLISE**S**PIK	1.000	1	2	3.3	
NUF2	kinetochore protein Nuf2-like	IVD**S**PEKVK	1.000	1	2	2.8	
N/A	Lamin-L(I)	LKL**S**P**S**PSSR	1.000	2	2	2.4	*
LARP1B	La-related protein 1B	LDGPVENV**S**EDEAQSSSQR	1.000	1	2	3.9	*
LARP4	la-related protein 4-like	SSSGSEHSTEGSVSLGDGPL**S**R	1.000	1	3	4.5	
BAG6	Large proline-rich protein BAT3	ENA**S**PAPGTTAEEAMSR	1.000	1	2	3.6	
DBR1	Lariat debranching enzyme	SGETVE**S**GDEKDLSEFPVK	1.000	1	2	3.8	*
LUZP1	Leucine zipper protein 1	EKPD**S**DDDLDIESLVTAK	1.000	1	2	2.7	*
LUZP1	Leucine zipper protein 1	**S**QENIPQGFSVPNK	1.000	1	2	3.1	
LRRFIP2	Leucine-rich repeat flightless-interacting protein 2	NSASATTPLSGNS**S**R	0.990	1	2	3.3	
LRRC16A	Leucine-rich repeat-containing protein 16A	LEDLDTcMM**T**PK	1.000	1	2	3.1	
LRRC16A	Leucine-rich repeat-containing protein 16A	RS**S**GLISELPSEEGK	0.999	1	2	3.7	*
LIMA1	LIM domain and actin-binding protein 1	SEAQQPVHTKPL**S**PDAR	0.996	1	2	2.2	*
LMO7	LIM domain only protein 7	SR**S**TTELNDAATEK	0.991	1	2	4.0	*
PPFIA1	Liprin-alpha-1	VG**S**GSLDNLGR	0.999	1	2	2.4	
MSL1	Male-specific lethal 1-like	**S**PLGGGGGSGASSQAAcLK	1.000	1	2	4.4	*
MSL1	Male-specific lethal 1-like	H**S**PIKEEPcGSLSETVcK	1.000	1	3	4.9	*
MELK	maternal embryonic leucine zipper kinase isoform 1	**S**MEVDLNQAHMEDTPK	1.000	1	2	2.3	*
MELK	maternal embryonic leucine zipper kinase isoform 1	GTNVFG**S**LER	1.000	1	2	2.8	
MED1	mediator of RNA polymerase II transcription subunit 1	SQ**T**PPGVATPPIPK	1.000	1	2	2.5	
NF2	Merlin	RL**S**MEIEK	1.000	1	2	2.4	*
MTA1	Metastasis-associated protein MTA1	LPEASQ**S**PLVLK	0.994	1	2	3.0	
MTA1	Metastasis-associated protein MTA1	SSSSVLSSL**T**PAK	1.000	1	2	3.3	
MECP2	Methyl-CpG-binding protein 2	AETSESSGSAPAVPEASA**S**PK	1.000	1	2	4.3	
DGCR8	Microprocessor complex subunit DGCR8	LLIDPNcSGH**S**PR	0.995	1	2	2.3	*
MAP1B	Microtubule-associated protein 1B	AQSLEGEKL**S**PK	1.000	1	2	3.3	*
MAP1B	Microtubule-associated protein 1B	SPSLSPSPP**S**PIEK	0.999	1	2	3.6	
MCMBP	mini-chromosome maintenance complex-binding protein-like	VH**S**PPASLVPR	1.000	1	2	2.2	
TOMM34	Mitochondrial import receptor subunit TOM34	VP**S**AGDVER	1.000	1	2	2.7	*
TRMT10C	Mitochondrial ribonuclease P protein 1	**S**ADEEAADLPTKPTK	1.000	1	2	2.8	*
MAPK6	mitogen-activated protein kinase 6	GHL**S**EGLVTK	1.000	1	2	2.9	
MAP3K7	Mitogen-activated protein kinase kinase kinase 7	M**S**ADMSEIEAR	1.000	1	2	2.2	*
MAP3K7	mitogen-activated protein kinase kinase kinase 7-like	**S**IQDLTVTGTEPGQVSSR	1.000	1	2	4.4	
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	AA**S**SLNLSNGETESVK	0.993	1	2	3.3	*
MAPK4	Mitogen-activated protein kinase kinase kinase kinase	RD**S**PLQGSGQQNSQAGQR	1.000	1	3	3.9	

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MAP3K5	mitogen-activated protein kinase kinase kinase kinase 5-like, partial	TA**S**EINFDK	0.996	1	2	2.3	*
MORC2	MORC family CW-type zinc finger protein 2A	SLAV**S**DEEEAEEEAEK	1.000	1	2	3.3	*
MPHOSPH8	M-phase phosphoprotein 8	LP**S**PMSIQAPK	1.000	1	2	3.3	
MVB12A	multivesicular body subunit 12A-like	GL**S**LDPPTQPSK	1.000	1	2	2.8	
MYBBP1A	Myb-binding protein 1A	ANTPSQVNG**T**PVTK	0.998	1	2	2.5	
MYBBP1A	Myb-binding protein 1A	SP**S**LLQSVVK	1.000	1	2	3.0	*
MYBBP1A	Myb-binding protein 1A	LSQVNGG**T**PV**S**PIEPEGK	1.000	2	2	4.0	*
BIN1	Myc box-dependent-interacting protein 1	GNK**S**P**S**PPPDGSPAATPEIR	1.000	3	3	3.9	*
BIN1	Myc box-dependent-interacting protein 1	VNHEPEPASGA**S**PGATIPK	1.000	1	3	4.6	*
MEF2C	myocyte-specific enhancer factor 2C-like isoform 1	N**S**PGLLVSPGNLNK	1.000	1	2	2.6	*
MYH10	myosin-10	QLHIEGA**S**LEL**S**DDDTESK	1.000	2	3	4.1	*
MYO9A	Myosin-IXa	AA**S**AcEALGTEGPLGQAK	1.000	1	2	3.1	
MYO9B	Myosin-IXb	ISSSTSDISRL**S**PVK	0.994	1	2	2.8	*
MYO18A	Myosin-XVIIIa	SLAPDP**S**DDENGPVDSTSRPR	1.000	1	2	2.3	
NELFE	negative elongation factor E-like	SV**S**ADEDLQESSR	0.998	1	2	4.4	*
NGDN	neuroguidin-like	LN**S**EDEEEDEAEEDQSEAAGK	1.000	1	2	5.6	*
NAV3	Neuron navigator 3	SQ**S**FNSIDK	0.999	1	2	2.6	
SLC1A5	Neutral amino acid transporter B(0)	TPS**S**EPELIQVK	0.995	1	2	2.5	
NAB2	NGFI-A-binding protein 2 isoform 1	SF**S**PK**S**PLELGEK	0.995	2	2	2.7	
NIPBL	nipped-B-like protein	AITSLLGGG**S**PK	1.000	1	2	2.8	*
NIPBL	nipped-B-like protein	GSRPPLILQSQSLPcS**S**PR	0.991	1	3	4.3	
NKTR	NK-tumor recognition protein	QDSSASLA**S**PVEIAGK	1.000	1	2	2.2	
NASP	nuclear autoantigenic sperm protein-like	AALEQLSGQDVKV**S**PK	1.000	1	2	3.7	*
NASP	nuclear autoantigenic sperm protein-like	SLSKPE**T**DTEQESEVEK	1.000	1	2	3.7	*
NFIB	nuclear factor 1 B-type	DQDMS**S**PTTMK	0.994	1	2	2.3	
NFIC	Nuclear factor 1 C-type	SPFNSP**S**PQDSPR	1.000	2	2	2.5	*
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	GADNDG**S**GSESGYTTPK	0.997	1	2	4.6	*
NUFIP2	nuclear fragile X mental retardation-interacting protein 2-like, partial	SL**S**SDEATNPISR	0.991	1	2	3.7	*
NUDC	Nuclear migration protein nudC	NGSLD**S**PGKQDAEEEEEEDEKDK	1.000	1	3	4.4	*
NUMA1	Nuclear mitotic apparatus protein 1	VSSETHQGPG**T**PESK	0.993	1	2	2.2	*
NUP88	Nuclear pore complex protein Nup88	ILAE**T**PDSFEK	1.000	1	2	3.0	
NUP88	Nuclear pore complex protein Nup88	EDAEVAE**S**PLR	1.000	1	2	3.0	
NRBP2	nuclear receptor binding protein	TP**T**PEPAEVETR	0.995	1	2	3.3	
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	ATVTP**S**PVKGK	0.998	1	2	2.3	
NUCKS1	nuclear ubiquitous casein and cyclin-dependent	NSQED**S**ED**S**EEKDVK	1.000	2	2	2.7	*

	kinases substrate-like						
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	TPSPKEEDEEAE**S**PPEKK	1.000	1	3	4.1	*
N/A	nuclease domain-containing protein 1	AA**S**PATETVPAFSER	0.997	1	2	2.3	
YBX1	nuclease-sensitive element-binding protein 1-like	NEGSE**S**APEGQAQQR	1.000	1	2	3.5	*
NOL11	Nucleolar protein 11	**S**ETNLQAEVPGSK	1.000	1	2	2.9	*
NOP14	nucleolar protein 14	FGEYNSNI**S**PEEK	0.992	1	2	2.6	*
NOP14	nucleolar protein 14	HNDIVD**S**DNDTEER	1.000	1	2	5.1	*
NOP56	Nucleolar protein 56	EELP**S**DSEEVATcSVSVPK	0.992	1	2	3.7	
NOP56	Nucleolar protein 56	EEmV**S**DPEEAA**S**PIIPK	1.000	2	2	4.7	*
NOP58	Nucleolar protein 58	EEPL**S**DEEPcTSTAIPSPEK	0.997	1	2	2.4	
DDX21	Nucleolar RNA helicase 2	IEEP**S**EEDADVPKPR	1.000	1	2	2.7	*
DDX21	Nucleolar RNA helicase 2	SP**S**EDDMEPPK	1.000	1	2	3.2	*
NCL	nucleolin	GL**S**EDTTEETLK	0.999	1	2	2.3	*
NCL	Nucleolin	ALVA**T**PGKK	1.000	1	2	2.7	
NPM1	Nucleophosmin	GPS**S**VEDIK	0.995	1	2	2.7	
NPM1	Nucleophosmin	cGSGPVHISGQHLVAVEEDAE**S**EDEDEEDVK	1.000	1	3	4.8	*
NDC1	nucleoporin NDC1-like	KLN**S**PEETTFQTPK	1.000	1	2	2.6	*
NUP35	nucleoporin NUP53-like	GALSSPSLAF**T**PIK	1.000	1	2	2.9	
NME2	nucleoside diphosphate kinase B-like	NIIHG**S**DSVQSAEK	1.000	1	2	3.5	*
NACC1	nucleus accumbens-associated protein 1	FS**T**PDLAINR	1.000	1	2	2.9	
OTUD4	OTU domain-containing protein 4	TP**S**QIIR	1.000	1	2	2.6	
OTUD4	OTU domain-containing protein 4	EE**SS**EDENEVSNILK	1.000	2	2	3.5	*
OTUD4	OTU domain-containing protein 4	KTDIALASG**S**PGVEGK	1.000	1	3	4.5	*
PALLD	Palladin	SRD**S**GDENEPIQER	0.994	1	2	3.5	*
PSIP1	PC4 and SFRS1-interacting protein	QSNAS**S**DVEVEEK	0.995	1	2	2.4	
PSIP1	PC4 and SFRS1-interacting protein	QVETEESGMVAAATASSNLKA**S**PK	1.000	1	2	3.0	
PCM1	Pericentriolar material 1 protein	NVR**S**DV**S**DQEEDEESER	1.000	2	3	3.8	*
GIGYF2	PERQ amino acid-rich with GYF domain-containing protein 2 isoform 1	ALSSGGSIT**S**PPLSPALPK	0.999	2	2	3.9	
PCNP	PEST proteolytic signal-containing nuclear protein	DTPTSAGPN**S**FNK	1.000	1	2	2.5	
PHF14	PHD finger protein 14	SNED**S**LILEK	1.000	1	2	2.5	
PHF1	PHD finger protein 2	LEK**S**PLAGNK	1.000	1	2	3.0	
PHF8	PHD finger protein 8	SSGSSSSGLGTVSN**S**PVSQR	0.998	1	2	3.4	
FARSA	phenylalanyl-tRNA synthetase alpha chain-like	LDTEPR**S**PQTQEAA	1.000	1	2	2.2	
PI4KA	Phosphatidylinositol 4-kinase alpha	TSSVSSISQV**S**PER	1.000	1	2	3.2	
PI4KB	phosphatidylinositol 4-kinase beta isoform 1	**S**VENLPEcGITHEQR	1.000	1	2	2.8	*
PKP4	Plakophilin-4	VG**S**PLTLTDAQTR	1.000	1	2	2.5	
ATP2B1	Plasma membrane calcium-transporting ATPase 1	IED**S**EPHIPLIDDTDAEDDAPTK	1.000	1	3	6.3	*

PARG	poly(ADP-ribose) glycohydrolase	LENVPQLNLDK**S**PIEK	1.000	1	2	3.6	
FIP1L1	pre-mRNA 3'-end-processing factor FIP1-like	DH**S**PTPSVFNSDEER	1.000	1	2	3.8	*
SMARCA1	probable global transcription activator SNF2L1	ST**S**PLQLK	0.994	1	2	2.5	
ZDHHC5	probable palmitoyltransferase ZDHHC5	GD**S**LKEPTSIADSSR	1.000	1	2	2.6	*
AKT1S1	proline-rich AKT1 substrate 1-like	LN**T**SDFQK	0.998	1	2	2.6	
PSME4	Proteasome activator complex subunit 4	NPSINQTLL**S**PEK	1.000	1	2	3.2	
AATF	protein AATF-like	TESEEI**SS**EDDEPVAEK	1.000	2	2	3.6	*
CASC3	Protein CASC3	GTVTGERQ**S**GDGQESTEPVENK	1.000	1	3	5.0	*
DBF4	Protein DBF4-like A	AASMLNA**S**EPDIK	1.000	1	2	2.7	
DEK	protein DEK-like	DE**S**EEEEDDDEDEDEEEEKEK	1.000	1	2	3.3	*
AHCTF1	protein ELYS	TTPLASPSL**S**PGR	0.994	1	2	2.4	
FAM172A	protein FAM172A-like, partial	QL**S**ADGTDEPAEK	1.000	1	2	2.3	
STRIP1	Protein FAM40A	AA**S**PPASASDLIEQQQK	1.000	1	2	4.2	
FRYL	protein furry homolog-like isoform 1	SN**T**LDIMDGR	0.999	1	2	3.0	
HIRA	Protein HIRA	GVEPSP**S**PIKPGDIK	0.992	1	2	2.4	
JADE3	Protein Jade-3	**S**PQMPEEPLDMNVK	1.000	1	2	2.2	
KIAA1967	protein KIAA1967 homolog	EAAPDTGAEP**S**PVDSDPTYSSK	1.000	1	2	3.5	
PRKCD	Protein kinase C delta type	LLAEALNQV**S**QR	1.000	1	2	2.7	
ZMYND8	Protein kinase C-binding protein 1	ELSESVQQQSAPVPLI**S**PK	1.000	1	2	3.3	
ERBB2IP	Protein LAP2	LLQNGDILNN**S**PEEK	1.000	1	2	3.5	
LIN54	protein lin-54 homolog	IAI**S**PLK**S**PNK	1.000	2	2	2.8	*
LSM12	protein LSM12 homolog	TE**T**PPPLASLNVSK	1.000	1	2	2.8	
PATL1	Protein PAT1-like 1	ST**S**PVIGSPPVR	0.993	1	2	2.9	
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	LA**S**TSDIEEK	0.991	1	2	2.7	
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	**S**PLIESTANMENNQPQK	1.000	1	2	3.0	
PPM1G	Protein phosphatase 1G	KLEEAL**S**VEGAEENGNSDK	1.000	1	3	5.5	*
PPP1R2	Protein phosphatase inhibitor 2	EHE**SS**GEEDNDLSPEER	1.000	2	2	2.4	
PRRC2A	protein PRRC2A-like	EGPEPAEEVPPPTT**S**PAPK	0.991	1	2	3.3	
RER1	protein RER1-like	VDPSLMED**S**DDGPSLPTK	1.000	1	2	3.1	
S100A13	Protein S100-A13	KG**S**LSINEFK	0.999	1	2	2.5	*
SON	Protein SON	ESEQTAAVGL**S**PK	1.000	1	2	2.4	
SPDL1	Protein Spindly	LVD**S**PVSADALR	1.000	1	2	3.3	
FAT1	protocadherin Fat 1-like	DMPAAG**S**LGSSSR	1.000	1	2	2.8	
PCDH7	Protocadherin-7	SVNGGPG**S**PDLAR	1.000	1	2	2.3	
GULP1	PTB domain-containing engulfment adapter protein 1-like, partial	ITQVSS**S**PAGSVTAK	0.990	1	2	3.7	
PUM1	pumilio homolog 1 isoform 1	RD**S**LTGSSDLYK	1.000	1	2	3.2	*
PUM2	Pumilio-like 2	QA**S**PTEVVER	1.000	1	2	2.3	
PUM2	Pumilio-like 2	GKA**S**PFEEDQNR	1.000	1	2	3.1	*

MYCBP2	putative E3 ubiquitin-protein ligase MYCBP2	VN**S**GDTEVGSSLLR	1.000	1	2	2.3	
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	SE**S**PPAELPSLR	1.000	1	2	2.6	
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	DDSLDL**S**PQGR	1.000	1	2	3.1	*
TRIP12	putative E3 ubiquitin-protein ligase TRIP12	HLAESESLLT**S**PPK	0.994	1	2	3.7	
HNRNPA1	Putative heterogeneous nuclear ribonucleoprotein A1-like protein 3	SE**S**PKEPEQLR	1.000	1	2	2.6	*
NOP2	putative ribosomal RNA methyltransferase NOP2	GVDSETPVVPSPSEI**S**PGLK	1.000	1	2	4.4	*
SCAF8	Putative RNA-binding protein 16	TSEPVKETVQTTQ**S**PTPVEK	0.999	1	3	4.0	*
PDXDC1	pyridoxal-dependent decarboxylase domain-containing protein 1	VQGTGV**T**PPPTPSGTR	0.999	1	2	2.7	*
RAPGEF1	Rap guanine nucleotide exchange factor 1	VVDN**S**PPALPPK	1.000	1	2	2.4	
RAPGEF1	Rap guanine nucleotide exchange factor 1	**S**DEQLSSLDR	1.000	1	2	2.4	
RIN2	Ras and Rab interactor 2	VHSQDL**S**PGPK	1.000	1	2	2.6	
RIN2	Ras and Rab interactor 2	QA**S**FLEAEGSAK	1.000	1	2	3.4	
N/A	Ras-associated and pleckstrin-likey domains-containing protein 1	TA**S**AGTVSDAEVR	0.993	1	2	3.7	*
RAB34	ras-related protein Rab-34-like isoform 1	IN**S**DDKNLYLTASK	1.000	1	2	3.3	
RRAS2	ras-related protein R-Ras2-like	FQEQEcPP**S**PEPTR	1.000	1	2	4.0	*
RB1CC1	RB1-inducible coiled-coil protein 1	**S**VEHVAPDPTDAER	1.000	1	2	2.7	*
N/A	rCG40478, isoform CRA_b	DEILPT**T**PISEQK	0.996	1	2	2.3	
REEP4	receptor expression-enhancing protein 4-like	SF**S**MQDLR	0.991	1	2	2.3	
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	ASVGQ**S**PVLPSTTFK	0.995	1	2	2.4	
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	DVEDMEL**S**DVEDDGSK	1.000	1	2	4.2	
RPTOR	Regulatory-associated protein of mTOR	ILDTSSLTQSAPA**S**PTNK	0.998	1	2	2.9	
RPTOR	Regulatory-associated protein of mTOR	GMLIHQVGG**S**PPASSTSScSLTNDVAK	1.000	1	3	3.9	
RSF1	Remodeling and spacing factor 1	GLSEGQ**S**PENAIPEILK	1.000	1	2	2.7	*
RSF1	Remodeling and spacing factor 1	IE**S**DEEEDFENVGK	1.000	1	2	5.0	*
RBBP6	Retinoblastoma-binding protein 6	SR**S**PQAFR	1.000	1	2	2.5	*
RBBP6	Retinoblastoma-binding protein 6	VEGAEIVKP**S**PK	1.000	1	2	2.6	
RBL1	Retinoblastoma-like protein 1	VIAISGDAE**S**PAK	1.000	1	2	3.3	
ARHGAP1	rho GTPase-activating protein 1	SS**S**PEPVTHLK	0.994	1	2	2.5	
ARHGAP29	rho GTPase-activating protein 29	GLTANIGN**S**EDHSSR	1.000	1	2	3.4	*
ARHGAP29	rho GTPase-activating protein 29	AEEEQLSS**S**AGLAK	0.997	1	2	3.8	
ARHGEF5	rho guanine nucleotide exchange factor 5-like	LDSLAEAPGLS**S**PR	0.993	1	2	3.2	
ARHGEF6	Rho guanine nucleotide exchange factor 6	KD**S**VPQLLLPEEEK	1.000	1	2	2.3	
ARHGEF6	Rho guanine nucleotide exchange factor 6	m**S**GFIYQGK	1.000	1	2	2.7	*
ARHGEF6	Rho guanine nucleotide exchange factor 6	KA**S**EEEYVIR	1.000	1	2	2.8	*
N/A	riboflavin transporter 2-like isoform 1	DAEDAS**S**LGAPVTSPGK	0.997	1	2	3.8	

RRM2	ribonucleoside-diphosphate reductase subunit M2-like	VPLATITDQQQLQV**S**PLK	1.000	1	2	4.6	
RPS6KA3	ribosomal protein S6 kinase alpha-3	NQ**S**PVLEPVGR	1.000	1	2	2.4	
CTR9	RNA polymerase-associated protein CTR9 homolog	GEEG**S**DDDETENGPKPK	1.000	1	2	2.7	*
RPUSD2	RNA pseudouridylate synthase domain-containing protein 2	IAEAPSQDLD**T**PEK	1.000	1	2	2.3	
RBM25	RNA-binding protein 25	LGASN**S**PGQPNSVK	1.000	1	2	3.0	*
RBM5	RNA-binding protein 5	LQSFD**S**PER	1.000	1	2	2.5	
RALY	RNA-binding protein Raly-like	GRL**S**PVPVPR	1.000	1	2	2.2	*
SLTM	SAFB-like transcription modulator	**S**PGHMVILNQTK	1.000	1	2	2.3	*
SLTM	SAFB-like transcription modulator	KED**S**VKGDPVEK	1.000	1	2	2.8	
SLTM	SAFB-like transcription modulator	DGQDAIAQ**S**PEK	1.000	1	2	3.9	*
ATP2A2	Sarcoplasmic/endoplasmic reticulum calcium ATPase 2	EFDELSP**S**AQR	1.000	1	2	2.6	
SCFD1	Sec1 family domain-containing protein 1	VNLEESAGVEN**S**PAGARPK	1.000	1	2	3.1	*
SENP3	sentrin-specific protease 3	R**S**PPVPSGPPMEEDGLR	1.000	1	3	3.8	
SEPT8	septin-7	ILEQQNSSR**T**LEK	0.999	1	2	3.4	*
SEPT9	septin-9	ATVASS**S**QKFQDLGVK	0.995	1	2	3.5	*
SEPT9	septin-9	**S**FEVEEIEPPNSTPPR	1.000	1	2	4.4	
SQSTM1	Sequestosome-1	LTPT**S**PESSSMDTEDK	0.991	1	2	2.4	
SRRM1	Serine/arginine repetitive matrix protein 1	RL**S**P**S**A**S**PPR	1.000	3	2	2.2	*
SRRM1	Serine/arginine repetitive matrix protein 1	KVEL**S**ESEEDK	0.992	1	2	3.0	*
SRRM1	Serine/arginine repetitive matrix protein 1	KE**T**E**S**EAEDNLDDLER	1.000	2	2	5.0	*
SRRM1	Serine/arginine repetitive matrix protein 1	APKPEPVPEPKEP**S**PEK	1.000	1	3	4.0	*
SRRM2	Serine/arginine repetitive matrix protein 2	KPIDSLRD**S**R	0.991	1	2	2.2	*
SRSF6	serine/arginine-rich splicing factor 6-like	SH**S**PLPAPPSK	1.000	1	2	2.8	
STK10	Serine/threonine-protein kinase 10	SRPL**S**MDAR	1.000	1	2	2.3	
STK10	Serine/threonine-protein kinase 10	ANQ**S**RPN**S**VALETLGGEK	1.000	2	2	2.8	*
STK10	Serine/threonine-protein kinase 10	EVTGQAEDS**S**PVASK	0.996	1	2	3.4	
BRAF	serine/threonine-protein kinase B-raf	SA**S**EPSLNR	0.999	1	2	2.3	*
PRKD1	Serine/threonine-protein kinase D1	SP**S**ESFIGR	0.999	1	2	2.7	
MARK2	Serine/threonine-protein kinase MARK2	SRN**S**PLLDR	1.000	1	2	3.0	*
MARK2	Serine/threonine-protein kinase MARK2	VPA**S**PLPGVER	1.000	1	2	3.2	*
PAK2	serine/threonine-protein kinase PAK 2-like	YL**S**FTPPEK	0.996	1	2	2.6	
SRPK1	serine/threonine-protein kinase SRPK1-like	QEESE**S**PVETPLTENPPNK	0.996	1	2	4.4	
TAOK3	serine/threonine-protein kinase TAO3	NGPLNE**S**QEEEEDNEHGSNLNR	1.000	1	3	4.5	*
PPP4R2	serine/threonine-protein phosphatase 4 regulatory subunit 2-like	AHSDSPASEPEVSSL**S**PVK	1.000	1	2	5.2	*
SH3BP1	SH3 domain-binding protein 1	TESDLPKPA**S**PK	1.000	1	2	2.8	*
SIPA1L1	Signal-induced proliferation-associated 1-like protein 1	LIDLE**S**PTPESQK	1.000	1	2	3.5	

SSBP3	Single-stranded DNA-binding protein 3	N**S**PNNISGISNPPGTPR	1.000	1	2	3.4	
PDS5A	Sister chromatid cohesion protein PDS5-like A	AAGSQE**S**PGGLEASNAK	1.000	1	2	3.9	*
SNW1	SNW domain-containing protein 1-like	GPP**S**PPAPVMH**S**PSR	0.996	2	2	2.8	*
SCNM1	sodium channel modifier 1-like isoform 1	ESSDLLASAPI**S**PTK	0.991	1	2	2.8	
UTP3	something about silencing protein 10-like	KKEEN**S**AEEEALEEQNAK	1.000	1	3	4.9	*
SORT1	Sortilin	GVNTF**S**PEGR	0.999	1	2	2.3	
SORT1	Sortilin	IT**S**PLMEPSSIEK	0.999	1	2	2.4	
SPAST	spastin	AP**S**cSGLSMVSGGR	1.000	1	2	3.1	*
SPTBN1	spectrin beta chain, brain 1 isoform 1	GDQVSQNGLPAEQG**S**PR	1.000	1	2	5.1	*
Ssfa2	sperm-specific antigen 2 homolog	TPLGA**S**LDEQSSGALK	1.000	1	2	3.8	*
SSFA2	Sperm-specific antigen 2-like	SQ**S**LPTTLLSPVR	0.996	1	2	2.4	
SSFA2	Sperm-specific antigen 2-like	SLA**S**IEAQcSGMSSEK	1.000	1	2	3.3	
SRSF11	Splicing factor, arginine/serine-rich 11	LNHVAAGLV**S**PSLK	1.000	1	2	3.5	*
SFSWAP	splicing factor, suppressor of white-apricot homolog	VKLDDD**S**EEDEESR	1.000	1	2	4.0	*
SFSWAP	splicing factor, suppressor of white-apricot homolog	GV**S**QEKDGQISSAIVSSVQSK	1.000	1	3	4.3	*
SART3	Squamous cell carcinoma antigen recognized by T-cells 3	cVTIDVA**S**PSK	0.993	1	2	2.6	
STMN2	Stathmin-2	DL**S**LEEIQK	1.000	1	2	2.7	
STIM1	Stromal interaction molecule 1	AEQ**S**LHDLQER	1.000	1	2	3.2	*
STIM1	Stromal interaction molecule 1	AVAEEDNGSIGEETDS**S**PGR	0.990	1	2	4.9	
PPAN	Suppressor of SWI4 1-like	TDGD**S**DAEDPGAPLEAVGAGR	0.999	1	2	3.7	*
SMARCC1	SWI/SNF complex subunit SMARCC1-like	KH**S**P**S**PPPPTPTESR	1.000	2	3	4.0	*
SMARCC2	SWI/SNF complex subunit SMARCC2	DMDEP**S**PVPNVEEVTLPK	1.000	1	2	3.5	
SMARCE1	SWI/SNF-related matrix-associated actin-dependent regulator chromatin subfamily E member 1	**S**QGSIAPEEEQVANK	0.998	1	2	3.1	
SNAP23	synaptosomal-associated protein 23-like isoform 1	ATWGDGGDN**S**PSNVVcK	0.999	1	2	3.5	
STX4	syntaxin-4-like	AIEPQKEEADENYN**S**VNTR	0.999	1	3	4.3	
TPX2	targeting protein for Xklp2	SSELPLTVPV**S**PK	1.000	1	2	2.3	
TMF1	TATA element modulatory factor	SVSEIN**S**DDELPGK	1.000	1	2	2.9	
TBC1D1	TBC1 domain family member 1	SF**S**QPGLR	1.000	1	2	2.5	
TBC1D15	TBC1 domain family member 15	DDSSAQTLA**S**PNAcR	1.000	1	2	3.0	*
TBC1D2B	TBC1 domain family member 2B	DTSPDKGELV**S**DEEEDT	1.000	1	2	3.8	*
TBC1D5	TBC1 domain family member 5	TISSSP**S**IE**S**LPGGR	0.997	2	2	2.3	
RIF1	Telomere-associated protein RIF1	SHEDEIS**S**PVNK	0.999	1	2	3.4	
RIF1	Telomere-associated protein RIF1	SSD**S**VDIGEQEEK	0.999	1	2	4.1	*
TERF2IP	telomeric repeat-binding factor 2-interacting protein 1	YLLGDAPV**S**PSSQK	0.996	1	2	3.4	*
TNS1	Tensin-1	TVGTNTPP**S**PGFGR	0.998	1	2	3.3	
SLC26A8	Testis anion transporter 1	AEIP**S**GDEQEQEHNGPLDNK	1.000	1	2	2.3	*
TTC7A	tetratricopeptide repeat protein 7A	DG**S**FEGLTVK	1.000	1	2	2.2	

TTC7B	Tetratricopeptide repeat protein 7B	VEQALSEVA**SS**LQSSAPK	1.000	2	2	3.6	*
TMX1	thioredoxin-related transmembrane protein 1-like	VEEEQEADEEDV**S**EEDTENK	1.000	1	2	4.9	*
THOC1	THO complex subunit 1	TGEDEDEEDNDALLKENE**S**PDVR	1.000	1	3	5.4	
THOC2	THO complex subunit 2	TPVSGSLK**S**PVPR	1.000	1	2	2.9	*
THUMPD1	THUMP domain-containing protein 1-like	FIDKDQQH**S**G**S**EGEDDDVEAALK	1.000	2	3	4.3	*
THRAP3	thyroid hormone receptor-associated protein 3-like	GSF**S**DADVK	1.000	1	2	2.6	*
THRAP3	thyroid hormone receptor-associated protein 3-like	ASVSDL**S**PR	1.000	1	2	3.0	
TRIP11	Thyroid receptor-interacting protein 11	LSVHDLKPLD**S**PGR	1.000	1	3	4.3	
TJP2	Tight junction protein ZO-2	DG**S**PPPAFKPEPPK	1.000	1	2	2.4	
TOR1AIP1	Torsin-1A-interacting protein 1	LEQTSQQPQPQL**S**PATSR	0.998	1	2	4.4	*
TRAIP	TRAF-interacting protein	AR**S**PVQDVLK	1.000	1	2	2.9	*
TCEA1	transcription elongation factor A protein 1-like	EPTISSQN**S**PEAR	0.999	1	2	2.2	
TFAP4	transcription factor AP-4-like	FIQELSGS**S**PK	0.996	1	2	2.7	
TFDP1	transcription factor Dp-1 isoform 1	VFIDQNL**S**PGK	1.000	1	2	2.4	
TAF6	transcription initiation factor TFIID subunit 6-like	QEAGD**S**PPPAPG**T**PK	1.000	2	2	2.4	
TRIM28	Transcription intermediary factor 1-beta	**S**GEGEVSGLMR	1.000	1	2	2.9	*
ATRX	Transcriptional regulator ATRX	LTV**S**DGE**S**GEEEKK	0.999	2	2	2.8	*
ATRX	Transcriptional regulator ATRX	EVIEIEDA**S**PTK	1.000	1	2	3.2	
GATAD2A	Transcriptional repressor p66 alpha	DTSTEALLKS**S**PEER	0.993	1	2	2.9	
TFRC	Transferrin receptor protein 1	LAVDEEEN**T**DNNMK	1.000	1	2	3.5	*
TAGLN2	transgelin-2-like	NF**S**DNQLQEGK	1.000	1	2	3.7	*
EIF2B5	translation initiation factor eIF-2B subunit epsilon-like	AV**S**PQLDDIK	1.000	1	2	2.9	*
TRAM1	Translocating chain-associated membrane protein 1	KGTENGVNGAVTSNGAD**S**PR	1.000	1	3	3.8	*
SEC62	Translocation protein SEC62	EELEQQ**T**DGDcDEEDDDKDGEMPK	1.000	1	3	4.1	
TMEM115	transmembrane protein 115-like	DSPLPSEEAS**T**PPGK	0.996	1	2	2.9	
TBCB	Tubulin-folding cofactor B	cEVQ**S**PGQSLR	1.000	1	2	2.2	
TFIP11	tuftelin-interacting protein 11-like	GAAEEAD**S**DD**S**DDDEKPAKQEDFPK	1.000	2	3	4.9	*
TP53BP1	Tumor suppressor p53-binding protein 1	DSVEED**S**PQPPLPSVK	0.997	1	2	2.2	
BAZ1B	Tyrosine-protein kinase BAZ1B	RQ**S**LELQK	1.000	1	2	2.7	*
BAZ1B	Tyrosine-protein kinase BAZ1B	LADDEGD**S**DSESVGQSR	1.000	1	2	5.4	*
PTPN12	Tyrosine-protein phosphatase non-receptor type 12	DVDVSEE**S**PPPLPER	1.000	1	2	2.9	
YARS	tyrosyl-tRNA synthetase, cytoplasmic	L**S**AGSGESGAMGDAPSPEEK	1.000	1	2	3.7	*
MPHOSPH10	U3 small nucleolar ribonucleoprotein protein MPP10	VTFALPEDEAEDT**S**PLAVK	1.000	1	2	5.0	
MPHOSPH10	U3 small nucleolar ribonucleoprotein protein MPP10	LETDAEEEQL**S**DVAADAPK	1.000	1	2	5.2	*
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	KS**S**DDE**S**EEDEDDLLQR	0.991	2	2	2.5	*
PRPF3	U4/U6 small nuclear ribonucleoprotein Prp3	GDDDEE**S**DEEAVKK	1.000	1	2	3.4	*

UCHL1	Ubiquitin carboxyl-terminal hydrolase 1	ATGDTLEI**S**PK	1.000	1	2	3.1	
USP15	ubiquitin carboxyl-terminal hydrolase 15-like	**S**PGASNFSALPK	1.000	1	2	2.2	*
USP24	Ubiquitin carboxyl-terminal hydrolase 24	VSDQN**S**PVLPK	1.000	1	2	3.1	*
USP36	ubiquitin carboxyl-terminal hydrolase 36	DTIFST**S**PK	0.998	1	2	2.3	
USP36	ubiquitin carboxyl-terminal hydrolase 36	LQ**S**PEEVGAPVSR	1.000	1	2	4.3	
USP5	ubiquitin carboxyl-terminal hydrolase 5 isoform 2	SAAD**S**ISESVPVGPK	0.991	1	2	3.0	
UBE4B	ubiquitin conjugation factor E4 B-like	SQ**S**MDIDGVScEK	0.997	1	2	4.3	*
UBAP2L	Ubiquitin-associated protein 2-like	YPSSISS**S**PQK	0.992	1	2	2.5	
UBAP2L	Ubiquitin-associated protein 2-like	SANDSTVH**S**PFTK	1.000	1	2	2.5	*
C12orf45	Uncharacterized protein C12orf45-like	IEVLD**S**PASK	0.990	1	2	2.5	
TICRR	Uncharacterized protein C15orf42-like	LHPDG**S**PDMAVEK	1.000	1	2	2.7	
N/A	Uncharacterized protein C20orf135-like	NSATFK**S**FEDR	1.000	1	2	2.7	*
FAM208A	Uncharacterized protein C3orf63-like	GAQ**S**PLLEVDAASVK	1.000	1	2	3.4	
N/A	uncharacterized protein C6orf203 homolog	DADEED**S**DEETHLPER	1.000	1	2	3.5	*
C9orf142	Uncharacterized protein C9orf142-like	LAAAEEIAT**S**PR	0.995	1	2	3.1	
C9orf78	uncharacterized protein C9orf78 homolog	RAD**S**E**S**EEDEQESEEVR	1.000	2	2	3.6	*
CXorf23	Uncharacterized protein CXorf23-like	VQEESYPQ**S**PR	1.000	1	2	3.9	*
N/A	Uncharacterized protein KIAA1267	L**S**PSTDSSSNLTNVK	1.000	1	2	2.5	*
KIAA1522	Uncharacterized protein KIAA1522	GLAGPPA**S**PGK	1.000	1	2	2.9	
KIAA1614	Uncharacterized protein KIAA1614	YNQSI**S**LR	1.000	1	2	2.2	
URI1	unconventional prefoldin RPB5 interactor-like	SL**S**cEEASEGR	0.999	1	2	2.3	*
PBDC1	UPF0368 protein Cxorf26 homolog	GADNEEEE**S**EKGAD**S**GGEKEEGVNR	1.000	2	3	4.3	*
C1orf52	UPF0690 protein C1orf52-like	LLPEGEETVE**S**DDDKDER	1.000	1	2	3.8	*
VPS4B	Vacuolar protein sorting-associated protein 4B	EEQSSAVDEKGND**S**DGEAESDDPEK	1.000	1	3	4.9	
HDLBP	vigilin-like	VATLN**S**EEESDPPTYK	0.995	1	2	4.4	
KCNAB2	Voltage-gated potassium channel subunit beta-2	RS**S**LVITTK	0.993	1	2	2.3	*
KCNAB2	voltage-gated potassium channel subunit beta-2-like isoform 1	MYPESTTG**S**PAR	1.000	1	2	2.8	
VWA5A	von Willebrand factor A domain-containing protein 5A	AYVSLD**S**MEDEESESK	1.000	1	2	4.9	
WDHD1	WD repeat and HMG-box DNA-binding protein 1	SHILGDDEN**S**VDAPMLK	1.000	1	2	2.9	*
WAPAL	wings apart-like protein homolog	SE**S**PSEScPVK	1.000	1	2	2.6	
SLC7A6	Y+L amino acid transporter 2	EDVSSP**S**PGPAETVQLK	1.000	1	2	2.5	
YEATS2	YEATS domain-containing protein 2	LPVASQVPQGTG**S**PIPK	0.997	1	2	3.2	
YLPM1	YLP motif-containing protein 1	SGGPLPE**S**PR	1.000	1	2	2.8	
ZC3H13	Zinc finger CCCH domain-containing protein 13	SKL**S**P**S**PSLR	0.993	2	2	2.3	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	SL**S**PSHLSEDR	0.999	1	2	2.5	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	SKGD**S**DV**S**DEEVAPQSK	1.000	2	2	3.6	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	GNLETSEDAQVF**S**PK	1.000	1	2	3.6	
ZC3H18	zinc finger CCCH domain-containing protein 18	A**S**DLEDEENATR	1.000	1	2	2.3	*

	isoform 2						
ZMYM4	zinc finger MYM-type protein 4	ASHHE**S**DNENEIQIQNK	1.000	1	3	5.2	*
ZNF106	zinc finger protein 106	LSF**T**PETPVEK	1.000	1	2	2.4	
ZNF106	zinc finger protein 106	SL**S**ESSVIVDR	0.993	1	2	2.4	
ZNF106	zinc finger protein 106	ATGDG**SS**PELPSLER	1.000	2	2	2.4	*
ZNF148	Zinc finger protein 148	GGLLTSEEDSGFST**S**PK	0.994	1	2	3.8	
ZNF326	zinc finger protein 326	MNLSK**S**PAK	0.999	1	2	3.3	*
ZNF592	zinc finger protein 592	EAIQTPSEENE**S**PLK	1.000	1	2	2.3	
ZNF609	zinc finger protein 609-like, partial	LVEPH**S**P**S**PSSK	0.992	2	2	2.5	*
ZNF609	zinc finger protein 609-like, partial	AP**S**LTDLVK	1.000	1	2	2.9	
ZNF638	Zinc finger protein 638	IPP**S**PELNLK	1.000	1	2	2.3	
ZNF740	zinc finger protein 740-like	AG**S**PEVLR	1.000	1	2	2.3	
ZNF438	zinc finger protein 828	AGPA**S**PESVK	1.000	1	2	2.7	
ZNF438	zinc finger protein 828	TGPSL**S**PEPQK	1.000	1	2	3.6	*
ZNF438	zinc finger protein 828	cDSVVQEGLLA**T**PK	1.000	1	2	4.0	
RLF	Zinc finger protein Rlf	SY**S**PEPSIcASK	0.999	1	2	2.8	
DPF2	zinc finger protein ubi-d4-like	VDDD**S**LGEFPVTNSR	1.000	1	2	3.7	
ELAC2	zinc phosphodiesterase ELAC protein 2-like, partial	QSSSDSASTDVSAENGER**S**PDGSSTGADR	1.000	1	3	4.3	

Table 4.3.18: List of phosphopeptides identified following LC/MS analysis of Iron phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO NCBI database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
TNKS1BP1	182 kDa tankyrase-1-binding protein	NIAPGAGc**S**PGQPR	1.000	1	2	2.6	
PFKL	6-phosphofructokinase, liver type	TL**S**IDKGF	0.999	1	2	2.4	*
AKAP1	A kinase anchor protein 1, mitochondrial	DNN**S**KVELSLMGDEVK	1.000	1	2	3.4	
ACACA	acetyl-CoA carboxylase 1	SSM**S**GLHLVK	1.000	1	2	3.0	*
AFAP1	actin filament-associated protein 1 isoform 1	SGTSSPQ**S**PVFR	1.000	1	2	2.5	
APEH	acylamino-acid-releasing enzyme-like isoform 1	ALDINA**S**DDEMARPK	1.000	1	2	2.6	*
AKAP12	A-kinase anchor protein 12	TEDSGTEQLA**S**DVELSK	0.998	1	2	3.2	
AKAP13	A-kinase anchor protein 13-like	SGSLDSELSV**S**PK	1.000	1	2	2.8	
AKAP2	A-kinase anchor protein 2	SP**S**DTMAEGER	0.990	1	2	2.3	*
AKAP2	A-kinase anchor protein 2	VScVSD**S**PSAGAGPGSTATQGK	0.998	1	2	3.6	
AKAP8L	A-kinase anchor protein 8-like	AD**S**DGDL**S**ENDDGAGDLR	1.000	2	2	4.0	*
AKAP9	A-kinase anchor protein 9	EG**S**LQDLDISETSVK	1.000	1	2	2.4	
PARVA	alpha-parvin-like	KKDD**S**FLGK	1.000	1	2	2.9	*
TXLNA	alpha-taxilin	EQGLE**S**PGAQPSSSPR	1.000	1	2	2.7	
MKI67	Antigen KI-67	RE**S**VNLDESEGAK	1.000	1	2	3.0	*
Aplf	aprataxin and PNK-like factor isoform 1	TTGTSQLQG**S**PEITK	0.999	1	2	2.9	*
ATXN2	ataxin-2	MSSEGPPRM**S**PK	1.000	1	2	2.4	
ATXN2	ataxin-2	AL**T**PSIEAK	1.000	1	2	2.4	
ATXN2L	Ataxin-2-like protein	MYPPR**S**PK	1.000	1	2	2.3	
DDX24	ATP-dependent RNA helicase DDX24	AQAV**S**EEEEEGEEEGESSSPQK	1.000	1	2	4.5	*
ARID1A	AT-rich interactive domain-containing protein 1A	GP**S**PSPVGSPASVAQSR	1.000	1	2	3.0	
ARID4A	AT-rich interactive domain-containing protein 4A	ILGQP**S**PEKK	1.000	1	2	2.3	
BIRC6	baculoviral IAP repeat-containing protein 6	LEGDSDDLLED**S**DSEEHSR	0.991	1	2	4.0	*
BCL9	B-cell CLL/lymphoma 9 protein	SLDRD**S**PGVENK	0.999	1	2	2.3	*
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	TETDISTVEQS**S**PSSK	0.997	1	2	4.6	
BAHD1	Bromo adjacent-likey domain-containing 1 protein	DL**S**PEPTPDEGAR	1.000	1	2	2.5	
BAZ1A	bromodomain adjacent to zinc finger domain protein 1A	RL**S**LGQEDNIASK	1.000	1	2	4.0	*
BRD3	bromodomain-containing protein 3 isoform 1	SE**S**PPPLSEPK	1.000	1	2	2.6	
BRD4	Bromodomain-containing protein 4	IH**S**PIIR	1.000	1	2	2.7	
CAST	Calpastatin	DT**S**PAPVAEAVPR	0.995	1	2	3.1	
CLIP1	CAP-Gly domain-containing linker protein 1	TASESISNLSEAG**S**VK	1.000	2	2	2.8	*

CTNND1	Catenin delta-1	AP**S**RQDVYGPQPQVR	1.000	1	3	3.9	*
CD2BP2	CD2 antigen cytoplasmic tail-binding protein 2-like	HSLD**S**DEEDDDDEGSSK	1.000	1	2	4.9	*
CDC42EP4	cdc42 effector protein 4-like	NAM**S**LPQLNEK	1.000	1	2	3.2	
CDC42EP4	cdc42 effector protein 4-like	AGEADSE**S**LDEQASTSSSSK	1.000	1	2	6.4	*
CDCA2	Cell division cycle-associated protein 2	ISSQN**S**PDDHLSSAK	0.992	1	2	3.1	*
CENPC	centromere protein C 1	ANE**S**LVVHR	1.000	1	2	2.6	*
CENPC	centromere protein C 1	HNLPSSENIV**T**PEDK	0.999	1	2	3.3	*
CENPC	centromere protein C 1	IVIGIV**S**PAPV**S**PK	1.000	2	2	4.5	*
CENPQ	centromere protein Q-like	DLDVLHNS**S**PVK	0.998	1	2	3.1	*
CENPU	centromere protein U-like	SL**S**PSESESSENK	0.992	1	2	2.5	
CEP170	Centrosomal protein of 170 kDa	SIK**S**DVPVYLK	0.991	1	2	2.6	
PCYT1A	Choline-phosphate cytidylyltransferase A	MLQAI**S**PR	1.000	1	2	2.5	
CHTF18	Chromosome transmission fidelity protein 18-like	GTMQALP**S**PR	1.000	1	2	2.3	
CIT	Citron Rho-interacting kinase	SESVVSGLD**S**PAK	1.000	1	2	3.6	
CPSF3	Cleavage and polyadenylation specificity factor subunit 3	LYAAL**T**PVH	1.000	1	2	2.3	
CLASP1	CLIP-associating protein 1	SVSTTG**S**LQR	0.993	1	2	2.3	
CLASP1	CLIP-associating protein 1	NSSNTNVG**S**PSNTIGR	0.999	1	2	3.2	*
CLASP1	CLIP-associating protein 1	SR**S**DIDVNAAASAK	0.998	1	2	5.4	*
CLASP2	CLIP-associating protein 2	SR**S**DIDVNAAAGAK	0.998	1	2	4.6	*
CLUAP1	Clusterin-associated protein 1	KPEPLDE**S**DNDF	1.000	1	2	3.0	
DENND4A	C-myc promoter-binding protein	MN**S**SFSVKPSEK	0.999	1	2	2.7	*
DENND4A	C-myc promoter-binding protein	TP**S**IDLQR	1.000	1	2	3.0	
CC2D1A	coiled-coil and C2 domain-containing protein 1A-like isoform 1	LANHDEG**S**EEEEDEAPK	1.000	1	2	4.0	*
Cc2d1b	coiled-coil and C2 domain-containing protein 1B-like	EAT**S**PDLSEEK	0.995	1	2	2.2	
CCDC12	coiled-coil domain-containing protein 12-like	GQEDNLASAVDATTGQEAcD**S**D	1.000	1	2	5.6	
N/A	coiled-coil domain-containing protein 165-like, partial	REGPVGGE**S**DSEDVcEK	0.999	1	2	3.1	*
CCDC6	Coiled-coil domain-containing protein 6	LDQPV**S**APP**S**PR	1.000	2	2	2.3	*
CCDC94	coiled-coil domain-containing protein 94-like isoform 2	LLED**S**D**S**EDEAPPSRPR	1.000	2	2	2.5	*
CRTC3	CREB-regulated transcription coactivator 3-like, partial	**S**NPSIQATLNK	1.000	1	2	2.7	*
CDK17	cyclin-dependent kinase 17	RA**S**LSEIGFGK	0.999	1	2	2.4	*
SLC7A11	Cystine/glutamate transporter	GGYLQGNV**S**GR	1.000	1	2	3.1	*
SLC7A11	Cystine/glutamate transporter	LP**S**MGDQEAPGQEK	1.000	1	2	4.1	*
DENND4C	DENN domain-containing protein 4C	VP**S**GLFDTNNR	1.000	1	2	2.5	
DIS3L2	DIS3-like exonuclease 2 isoform 1	SLGLEKE**S**DEEPED	1.000	1	2	2.9	
DAB2IP	disabled homolog 2-interacting protein isoform 1	LP**S**PTPENK	1.000	1	2	2.6	

ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	**S**FEDLTDHPVTR	1.000	1	2	2.7	*
DLG1	Disks large-like 1	EQLMSSSISSGSG**S**LR	0.999	1	2	4.7	
DNMT3A	DNA (cytosine-5)-methyltransferase 3A	SEPQPEEG**S**PAAGQK	1.000	1	2	2.5	
ERCC6	DNA excision repair protein ERCC-6	LDE**SS**EEESAR	1.000	2	2	3.3	*
ERCC6	DNA excision repair protein ERCC-6	IL**S**DDEGEEDAFK	1.000	1	2	3.5	
POLD3	DNA polymerase delta subunit 3	VDL**S**DEEAKETENLK	1.000	1	2	2.2	*
XRCC1	DNA repair protein XRCC1	ALGSScKPQE**S**PK	1.000	1	2	2.7	*
CD3EAP	DNA-directed RNA polymerase I subunit RPA34	mQPPDGTIL**T**PTK	0.999	1	2	2.8	
HUWE1	E3 ubiquitin-protein ligase HUWE1	AE**S**PEEVAcR	1.000	1	2	3.2	*
EML3	Echinoderm microtubule-associated protein-like 3	AA**S**SANLLLR	0.991	1	2	2.8	
EML4	Echinoderm microtubule-associated protein-like 4	A**S**P**S**PQPSSQPLQINR	1.000	2	2	2.9	
ELMOD3	ELMO domain-containing protein 3	TE**S**GERPAGDSDFSLKPGK	0.999	1	3	3.8	*
EEF2K	Elongation factor 2 kinase	KPE**S**DEDSLGSYGR	1.000	1	2	2.3	*
EPS8	epidermal growth factor receptor kinase substrate 8	ISAAASDSGVE**S**FDEGSGH	1.000	1	2	4.7	
ELF2	ETS-related transcription factor Elf-2-like isoform 1	TQQSPVSNG**S**PELGIK	1.000	1	2	3.7	
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	EATLPPV**S**PPK	1.000	2	2	2.5	
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	KAA**S**LTEDR	1.000	1	2	3.1	*
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PGPVQTAIIAPK	1.000	1	2	2.7	
EIF4B	Eukaryotic translation initiation factor 4B	YAAL**S**VDGEDENEGDDHAE	1.000	1	2	3.9	*
EIF5B	eukaryotic translation initiation factor 5B-like	WDG**S**EEDEDNSKR	1.000	1	2	2.6	*
EIF5B	eukaryotic translation initiation factor 5B-like	VEIF**S**G**S**EDDDDSNK	1.000	2	2	4.0	*
EIF5B	eukaryotic translation initiation factor 5B-like	NKPLPNIE**S**GNEDDDSFK	1.000	1	2	4.2	*
EIF5B	eukaryotic translation initiation factor 5B-like	TSFDDND**S**EELEDKDSK	1.000	1	2	4.7	*
FARP1	FERM, RhoGEF and pleckstrin domain-containing protein 1-like	VSALESGPHQ**S**PALSK	1.000	1	2	2.5	*
FNDC3B	Fibronectin type III domain-containing protein 3B	LN**S**PPSTIYK	0.999	1	2	2.7	
FIGNL1	fidgetin-like protein 1-like	AE**S**TETAHAIDDR	0.999	1	2	3.1	*
FLNA	Filamin-A	IV**S**PSGAAVScK	1.000	1	2	2.6	
FLNA	Filamin-A	cSGPGL**S**PGMVR	1.000	1	2	2.8	*
FLNA	Filamin-A	AP**S**VANVGSHcDLSLK	1.000	1	2	3.0	*
FLNA	Filamin-A	AFGPGLQGGNAG**S**PAR	1.000	1	2	3.4	*
FLNC	Filamin-C	LG**S**FGSITR	1.000	1	2	2.3	
FKBP15	FK506-binding protein 15	HNQDSQHSSL**S**GDEDDELFK	1.000	1	3	4.2	
FOXK1	forkhead box protein K1-like	SSGLQ**T**PEcL**S**R	1.000	2	2	2.6	*
FOSL2	fos-related antigen 2-like	**S**PPTAGLQPIR	1.000	1	2	2.4	*
FAM160A2	FTS and Hook-interacting protein-like isoform 2	QQ**S**LGGSESPGPAPR	1.000	1	2	2.3	
GAS2L1	GAS2-like protein 1	LTSGLPA**S**PR	1.000	1	2	2.4	
AGPAT9	glycerol-3-phosphate acyltransferase 3	NSA**S**VGIIQR	1.000	1	2	4.0	*

GOLGA3	Golgin subfamily A member 3	DVLQSAAAQHQDQNQEVNGEVQ**S**R	1.000	1	3	5.5	
HEATR6	HEAT repeat-containing protein 6	VPGGSSLEEVSVS**S**PK	0.993	1	2	4.0	*
HSPH1	Heat shock protein 105 kDa	IE**S**PKLER	1.000	1	2	2.3	*
HSP90AB1	heat shock protein HSP 90-beta-like	EI**S**DDEAEEEK	1.000	1	2	2.2	
HSP90AB1	heat shock protein HSP 90-beta-like	IEDVG**S**DEEDDSGK	1.000	1	2	4.0	*
SRCAP	helicase SRCAP-like	SEADGG**S**GPPTPGPTTTLGPK	0.997	2	2	2.3	
HDGFRP2	Hepatoma-derived growth factor-related protein 2	GG**SS**GEELEDNEPVK	1.000	2	2	5.2	*
HMGA1	high mobility group protein HMG-I/HMG-Y-like	EEEEGISQE**SS**EEEQ	1.000	2	2	2.3	
HIRIP3	HIRA-interacting protein 3-like	LTGGLGD**S**EEEK	1.000	1	2	2.4	
HIRIP3	HIRA-interacting protein 3-like	TGTVGcVN**S**E**S**DMER	1.000	2	2	2.9	*
HIRIP3	HIRA-interacting protein 3-like	HKE**S**ED**S**EEETLAK	1.000	2	2	3.8	*
HIRIP3	HIRA-interacting protein 3-like	VWEEED**T**EEDDDVKK	1.000	1	2	4.3	*
HIRIP3	HIRA-interacting protein 3-like	LEE**SS**DEEGEGSVR	1.000	2	2	4.4	*
KMT2D	Histone-lysine N-methyltransferase MLL2	LcPQPEELPL**S**PR	1.000	1	2	2.3	
KMT2D	Histone-lysine N-methyltransferase MLL2	LEGPA**S**PDVEPGKEETEESK	1.000	1	3	3.9	
SETD2	histone-lysine N-methyltransferase SETD2-like	cEENT**S**PVLDAVQSK	0.992	1	2	3.3	
DOT1L	Histone-lysine N-methyltransferase, H3 lysine-79 specific	AAATEAPVD**S**GAEEEK	1.000	1	2	2.9	
Htatsf1	HIV Tat-specific factor 1-like	VLGEEG**S**ER	1.000	1	2	2.3	*
N/A	hypothetical protein I79_008270	GN**S**PAAFPDR	1.000	1	2	3.3	
N/A	hypothetical protein I79_019528	LTLSEGHPE**T**PVDGDAGK	1.000	1	2	2.5	*
N/A	hypothetical protein I79_019528	DNNT**S**LTALEK	0.996	1	2	3.6	
N/A	hypothetical protein LOC100756984, partial	IQT**S**PE**S**DPEIDR	0.997	2	2	3.0	*
N/A	hypothetical protein LOC100756984, partial	RDHLDTPEDEL**S**DEPR	1.000	1	3	3.8	*
RHBDF2	inactive rhomboid protein 2	GVPQSA**S**PVSPDGVQIPLK	1.000	2	2	5.0	
INCENP	Inner centromere protein	**S**PLGDVQSVPLAK	1.000	1	2	2.3	
INCENP	Inner centromere protein	TP**S**PPcPANK	1.000	1	2	2.8	
INCENP	Inner centromere protein	VEKPATIAGENG**S**PVLR	1.000	1	3	4.8	
INO80E	INO80 complex subunit E-like	GSGASVGAAL**S**PLPPPK	1.000	1	2	2.9	
IRS1	insulin receptor substrate 1-like	HS**S**ETFSAPTR	0.994	1	2	3.0	*
IRS2	insulin receptor substrate 2, partial	RV**S**GDGAQDLDR	1.000	1	2	2.6	*
IRF2BP2	Interferon regulatory factor 2-binding protein 2	**S**PADSLSGASGASELGADGAGK	0.999	1	2	3.9	
IRF2BPL	interferon regulatory factor 2-binding protein 2-like, partial	LEEPPELNRQ**S**PNPR	1.000	1	2	2.6	*
IRF2BPL	interferon regulatory factor 2-binding protein-like	KA**S**PEPPDSAESALK	1.000	1	2	3.5	*
ITSN1	intersectin-1 isoform 2	LPEEPA**S**EDEQQLEK	1.000	1	2	3.1	*
KIF1B	kinesin-like protein KIF1B-like, partial	MADTG**S**PGMQR	0.991	1	2	2.6	
LMNA	Lamin-A/C	SGAQASSTPL**S**PTR	0.999	1	2	3.8	*
LARP4	la-related protein 4-like	EQFVPPR**S**PK	1.000	1	2	2.5	*

LUZP1	Leucine zipper protein 1	DFKc**S**EDVPTR	1.000	1	2	2.6	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	**S**VNEGAEQSLER	1.000	1	2	3.7	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	SEQQAEALD**S**PQK	1.000	1	2	4.0	
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	EL**S**QEVAEPEEALIQSPPTSK	1.000	1	2	4.3	*
LRRC47	Leucine-rich repeat-containing protein 47	E**S**GEGEDEVADSAR	1.000	1	2	3.3	
KDM2A	Lysine-specific demethylase 2A	KIEE**S**DEEAVQAK	1.000	1	2	4.3	*
KDM5C	lysine-specific demethylase 5C	VQGLLENGDSVT**S**PEK	0.995	1	2	3.5	
CCM2	Malcavernin	GIITD**S**FGR	0.994	1	2	2.5	
MSL3	male-specific lethal 3 homolog isoform 2	SS**S**PIPLTPSK	0.996	1	2	3.0	
MDC1	Mediator of DNA damage checkpoint protein 1	DPGAPVVTHLQD**S**PAGR	1.000	1	2	2.7	
MTA3	Metastasis-associated protein MTA3	HAELAG**S**PLK	1.000	1	2	3.0	*
MICALL2	MICAL-like protein 2	LP**S**PAPVQR	1.000	1	2	2.6	
MAP1A	Microtubule-associated protein 1A	cL**S**PDDSTVK	1.000	1	2	2.4	
MAP1B	Microtubule-associated protein 1B	GIK**S**PFEGK	1.000	1	2	2.5	*
MAP1B	Microtubule-associated protein 1B	ASI**S**PmDEPVPDSESPIEK	0.990	1	2	3.3	
MAP1B	Microtubule-associated protein 1B	SLM**SS**PEDLTK	1.000	2	2	4.1	*
MAP4	Microtubule-associated protein 4	IG**S**TENIK	0.991	1	2	2.3	
MAP4	Microtubule-associated protein 4	IG**S**TENLK	0.991	1	2	2.3	
MAP4	Microtubule-associated protein 4	VG**S**LDNVGHLPAGGAVK	1.000	1	2	3.2	*
MAP4	Microtubule-associated protein 4	AAVSVTGNDIT**T**PPNK	0.996	1	2	3.2	
MDN1	midasin-like	RQDEKEE**S**EPEDVEQSQEK	1.000	1	3	4.1	*
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	SH**S**FSDPSPPK	0.990	1	2	3.2	*
MPDZ	multiple PDZ domain protein-like isoform 1	GSLPQVS**S**PR	0.993	1	2	2.2	
MYH9	Myosin-9	GTGDc**S**DEEVDGKADGAEAKPAE	1.000	1	3	4.6	
MYO18A	Myosin-XVIIIa	LEGD**S**DVDSELEDR	1.000	1	2	4.4	
PPP1R9B	Neurabin-2	AEAVPEEEAASVA**T**PER	1.000	1	2	2.8	
NFATC2IP	NFATC2-interacting protein-like	LQDLQAcL**S**PK	1.000	1	2	3.3	
NHSL1	NHS-like protein 1	NH**S**P**S**PPVTPTGAAPSLASPK	1.000	2	3	4.2	
SETD6	N-lysine methyltransferase SETD6-like	APL**S**PPAPGR	1.000	1	2	3.0	
NFRKB	Nuclear factor related to kappa-B-binding protein	AVSTVVVTTAP**S**PK	1.000	1	2	2.4	
NUP153	Nuclear pore complex protein Nup153	RIPSAVS**S**PLN**S**PLDR	0.992	2	2	4.3	*
NUP98	Nuclear pore complex protein Nup98-Nup96	GDTVQEIc**S**PR	1.000	1	2	3.1	
NUP98	Nuclear pore complex protein Nup98-Nup96	YGLQD**S**DEEEEEHPPK	1.000	1	2	3.5	*
MDM1	nuclear protein MDM1-like isoform 1	GL**S**PVKEPK	1.000	1	2	2.5	*
NCOA3	Nuclear receptor coactivator 3	AV**S**LDSPVSVGSGPPVK	1.000	1	2	4.1	*
NR2C1	nuclear receptor subfamily 2 group C member 1	ALTPGESTAcQ**S**PVEDMK	1.000	1	2	2.4	
Nr2c2	nuclear receptor subfamily 2 group C member 2	IQIISTDSAVA**S**PQR	1.000	1	2	3.9	
NUCKS1	nuclear ubiquitous casein and cyclin-dependent	TSASSPLEK**S**GDEG**S**EDEAP**S**GED	1.000	3	2	3.4	*

	kinases substrate-like						
NOLC1	Nucleolar phosphoprotein p130	VADN**S**FDAKR	1.000	1	2	3.0	*
NOLC1	Nucleolar phosphoprotein p130	LQ**T**PN**T**FPK	1.000	2	2	3.6	*
NOLC1	Nucleolar phosphoprotein p130	AGKE**S**EEDEEEEETK	1.000	1	3	4.3	*
NOL8	Nucleolar protein 8	FLE**S**D**S**EEEEKELNENK	1.000	2	2	2.5	
OTUD7B	OTU domain-containing protein 7B-like	GI**S**HASSSIVSLAR	1.000	1	2	2.6	*
OSBP	Oxysterol-binding protein 1	MLAE**S**DE**S**GDEESVSQTDK	1.000	2	2	5.0	*
PRRX1	paired mesoderm homeobox protein 1-like, partial	LD**S**PGNLDTLQAK	1.000	1	2	2.5	
PALLD	palladin-like	IA**S**DEEIQGTK	1.000	1	2	2.8	*
PALMD	Paralemmin	EPAPLNG**S**AAELPDTK	1.000	1	2	2.7	
PALM	paralemmin-1	SDVMVNSQQTPQG**T**PK	0.995	2	2	3.9	
PARD3B	Partitioning defective 3-like	**S**MDLGIADETK	1.000	1	2	2.4	
PSIP1	PC4 and SFRS1-interacting protein	EAELSLKE**S**PLDN	1.000	1	2	3.4	
PSIP1	PC4 and SFRS1-interacting protein	NVAKPGVTST**S**D**S**EDEDDQEGGEK	0.997	2	3	4.2	*
PPIG	peptidyl-prolyl cis-trans isomerase G-like isoform 1	DQ**S**PVVLKPK	1.000	1	2	2.5	*
PCM1	Pericentriolar material 1 protein	VTNDI**S**PESSPGVGR	0.991	2	2	2.8	*
PLIN4	perilipin-4-like	GA**S**GLLQPSEQTTAGcK	1.000	1	2	3.4	*
GIGYF1	PERQ amino acid-rich with GYF domain-containing protein 1	**S**IEEGDGAFGR	1.000	1	2	3.3	
PHIP	PH-interacting protein	VL**S**D**S**EEEEKDADVPGTSTR	1.000	2	2	2.9	*
PIK3C2A	phosphatidylinositol-4-phosphate 3-kinase C2 domain-containing subunit alpha	ASVcNLQV**S**PK	1.000	1	2	2.8	
PPP1R18	Phostensin	DIETPQKPGPPA**S**PEK	1.000	1	2	2.3	
PPP1R18	Phostensin	EETLSPGIALDQ**S**PVTK	0.992	1	2	2.6	
PLEKHG3	Pleckstrin-likey domain-containing family G member 3	FSSAAET**S**PR	0.993	1	2	2.3	
PHLDB1	Pleckstrin-likey-like domain family B member 1	SALLAQNGTS**S**LPR	0.998	1	2	3.2	
PHLDB2	Pleckstrin-likey-like domain family B member 2	RL**S**AGTTVADVQK	0.990	1	2	3.2	*
PLEC	plectin	AQLEPVA**S**PAK	1.000	1	2	2.4	
PLEC	Plectin	NDESQL**S**PATR	0.999	1	2	2.8	
PHC3	polyhomeotic-like protein 3-like isoform 1	mDR**T**PPPPTL**S**PAAITVGR	1.000	2	3	4.0	
PTRF	polymerase I and transcript release factor-like	LPAKL**S**VSK	1.000	1	2	2.4	*
PBX2	Pre-B-cell leukemia transcription factor 2	TAVSVAQGGH**S**R	1.000	1	2	2.5	*
ADRM1	proteasomal ubiquitin receptor ADRM1-like	DKKDEEEDM**S**LD	1.000	1	2	2.7	*
PSMA3	Proteasome subunit alpha type-3	ESLKEEDE**S**DDDNm	1.000	1	2	4.3	*
AHNAK2	Protein AHNAK2	GPPASLEQPEA**S**PISK	0.999	1	2	4.3	*
AJUBA	protein ajuba-like	LETTAPAL**S**PR	1.000	1	2	2.4	
KNOP1	Protein C16orf88-like	**S**LPQATSQGScLK	1.000	1	2	2.3	*
N/A	protein C9orf140 homolog	SP**S**ADASAAVcK	0.994	1	2	3.5	*

CNPY3	Protein canopy-like 3	ELASLEGDA**S**PEEEEGVQK	1.000	1	2	2.2	
Ctla2b	protein CTLA-2-beta-like	YTEE**S**PTSENVEEK	1.000	1	2	3.7	*
DIAPH3	protein diaphanous homolog 3-like	GL**S**PAPPSGPHEPGEK	1.000	1	2	2.7	
AHCTF1	Protein ELYS	SVENEQ**S**PNIVR	1.000	1	2	3.0	*
FAM38A	Protein FAM38A	TA**S**ELLLDR	0.992	1	2	2.5	
HEXIM2	protein HEXIM2-like	EIH**S**EDEGIASAGVGSGcNNR	1.000	1	3	5.3	
IWS1	Protein IWS1-like	AAVL**S**D**S**EDEDKASAK	1.000	2	2	3.0	*
IWS1	Protein IWS1-like	VV**S**DADD**S**DSDVISDK	0.995	2	2	3.9	
IWS1	Protein IWS1-like	MD**S**DEDEEKEGDEEK	1.000	1	2	4.0	*
ZMYND8	Protein kinase C-binding protein 1	LPPSTAAGNQ**S**PPETPVLTR	1.000	1	2	4.3	*
KRI1	protein KRI1 homolog	A**S**PQAQLPVPNGAcGK	1.000	1	2	2.7	*
LNP	Protein lunapark	AD**S**VSNLEPSGESLVTQ	0.994	1	2	3.8	
MICAL3	Protein MICAL-3	GR**S**EEELEASK	1.000	1	2	3.4	*
SCRIB	protein scribble homolog, partial	RNEAFIcKPD**S**GPP**S**PSEEEK	0.991	2	3	4.5	*
SCRIB	Protein scribble-like	N**S**LESISSIDR	1.000	1	2	2.2	*
SCRIB	Protein scribble-like	MK**S**LEQDALR	1.000	1	2	2.3	*
SCRIB	Protein scribble-like	VLAAVPSAG**S**LQR	1.000	1	2	2.4	
ECD	protein SGT1 homolog	LPDNADHIPQG**S**Q	1.000	1	2	2.4	*
SESTD1	Protein SOLO	IQQQLGEEA**S**PR	1.000	1	2	3.3	*
TIMELESS	Protein timeless-like	ELLD**S**DEEEDEGR	1.000	1	2	4.0	
WIZ	Protein Wiz	APLTLAG**S**PTPK	0.990	1	2	2.3	*
TATDN2	Putative deoxyribonuclease TATDN2	VTVTVPQKEE**S**PTK	0.999	1	2	2.9	
DHX16	putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16-like, partial	LLED**S**E**S**GEEAVGSDSSSLQK	1.000	2	2	3.1	*
RBM15	Putative RNA-binding protein 15	SL**S**PGGAALGYR	0.996	1	2	3.0	
RBM15B	putative RNA-binding protein 15B-like	RN**S**LEGYSR	1.000	1	2	2.2	*
PYGO2	pygopus homolog 2-like	GGG**T**PDANSLAPPGK	1.000	1	2	3.4	
RIN1	Ras and Rab interactor 1	GGGN**S**EGELETTVDQGGGENQAR	1.000	1	3	3.9	
RPRD1B	regulation of nuclear pre-mRNA domain-containing protein 1B-like	LSMEDSK**S**PPPK	0.995	1	2	2.9	*
RMDN3	Regulator of microtubule dynamics protein 3	SH**S**LPDSLDR	1.000	1	2	2.7	*
RBL1	retinoblastoma-associated protein-like	KSNPDEEANVVTPH**T**PVR	1.000	2	3	4.0	*
ARHGEF17	Rho guanine nucleotide exchange factor 17	SL**S**DPIPQR	0.999	1	2	2.4	*
ARHGEF17	Rho guanine nucleotide exchange factor 17	**S**PGLSGDVTQGQR	1.000	1	2	3.2	*
ARHGEF5	rho guanine nucleotide exchange factor 5-like	SN**S**FPGFHR	0.996	1	2	2.3	
ARHGEF7	rho guanine nucleotide exchange factor 7-like	KP**S**DEEFAVR	1.000	1	2	2.9	*
RNF219	RING finger protein 219	SVELEGSSK**S**PR	0.996	1	2	2.4	*
RBM39	RNA-binding protein 39 isoform a	IGLPH**S**IK	1.000	1	2	2.5	
RBM39	RNA-binding protein 39 isoform a	DK**S**PVREPIDNLTPEER	1.000	1	3	4.5	*

RUNX1	Runt-related transcription factor 1	RF**T**PPSTAL**S**PGK	0.998	2	2	2.3	*
SASH1	SAM and SH3 domain-containing protein 1	AGG**S**VESLR	1.000	1	2	2.4	
SAFB	Scaffold attachment factor B1	SVV**S**FDKVK	1.000	1	2	2.7	*
SAFB2	Scaffold attachment factor B2	APTASL**S**PEPQDSK	0.999	1	2	4.1	*
SRRM1	Serine/arginine repetitive matrix protein 1	RY**S**P**S**PPPK	0.996	2	2	2.3	*
SRRM1	Serine/arginine repetitive matrix protein 1	**S**P**S**PAPPPPPPPR	1.000	2	2	2.3	*
SRRM1	Serine/arginine repetitive matrix protein 1	TA**S**PPPPPK	1.000	1	2	2.3	
SRRM1	Serine/arginine repetitive matrix protein 1	RY**S**PPIQR	1.000	1	2	2.3	*
SRRM2	Serine/arginine repetitive matrix protein 2	VP**S**PVPAPK	1.000	1	2	2.3	
SRRM2	Serine/arginine repetitive matrix protein 2	HV**SSS**PESLKPTPAPGAR	0.995	3	2	2.4	*
SRRM2	Serine/arginine repetitive matrix protein 2	SEL**S**PEQVK	1.000	1	2	2.4	
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PVPSAFSDQSR	1.000	1	2	2.5	*
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PGMLEPLGSAR	1.000	1	2	2.5	*
SRRM2	Serine/arginine repetitive matrix protein 2	GMLQ**T**PPEQNVPASK	1.000	1	2	2.6	
SRRM2	Serine/arginine repetitive matrix protein 2	SEQPLSQVIQSL**S**PEHK	0.998	1	2	2.7	*
SRRM2	Serine/arginine repetitive matrix protein 2	NSGPISEVNAGF**S**PEVK	1.000	1	2	2.8	*
SRRM2	Serine/arginine repetitive matrix protein 2	IGAG**S**PPGTR	0.996	1	2	3.1	*
SRRM2	Serine/arginine repetitive matrix protein 2	SSSEL**S**PEVVEK	0.999	1	2	3.3	
SRRM2	Serine/arginine repetitive matrix protein 2	mAPALSGANLT**S**PR	0.992	1	2	3.4	
SRRM2	Serine/arginine repetitive matrix protein 2	TPAAAAAMNLA**S**PR	1.000	1	2	4.0	*
SRRM2	Serine/arginine repetitive matrix protein 2	SIAQT**T**PVAGSQSLSSGTVAK	0.995	1	2	4.1	
STK11IP	Serine/threonine kinase 11-interacting protein	RA**S**ISEPSDTDPELR	0.990	1	2	3.3	
NEK1	Serine/threonine-protein kinase Nek1	Tc**S**LPDLSK	1.000	1	2	2.2	
NEK10	Serine/threonine-protein kinase Nek10	NGILASPQ**S**APGNLDNSK	1.000	1	2	3.1	
CDK14	Serine/threonine-protein kinase PFTAIRE-1	VH**S**ENNAcINFK	1.000	1	2	3.0	*
PPP2R5D	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform	RK**S**ELPQDVYTIK	1.000	1	2	2.9	*
SRRT	Serrate RNA effector molecule-like	HEL**S**PPQK	1.000	1	2	2.2	*
SH3PXD2A	SH3 and PX domain-containing protein 2A	AQIS**S**PNLR	0.993	1	2	2.3	
SH3PXD2A	SH3 and PX domain-containing protein 2A	AA**S**QGSESPLLPTQR	1.000	1	2	2.3	
SH3PXD2A	SH3 and PX domain-containing protein 2A	NE**S**LTATDSLR	1.000	1	2	2.8	
PDS5B	Sister chromatid cohesion protein PDS5-like B	METVSNASSSSNPS**S**PGR	0.994	1	2	3.1	
PDS5B	Sister chromatid cohesion protein PDS5-like B	AE**S**PESSAVESTQSTPQK	1.000	1	2	5.9	*
SKI	Ski oncogene	VVN**S**PPcTTVVSR	1.000	1	2	2.8	*
SNUPN	Snurportin-1	LK**S**PPH**S**PGNLMDN	1.000	2	2	2.6	
SLC4A7	sodium bicarbonate cotransporter 3-like	AL**S**MNTENAK	1.000	1	2	2.2	
SLC9A1	Sodium/hydrogen exchanger 1	LD**S**PTMSR	0.999	1	2	2.2	
SLC9A1	Sodium/hydrogen exchanger 1	IG**S**DPLAYEPK	1.000	1	2	2.6	
SORBS1	Sorbin and SH3 domain-containing protein 1	SA**T**LPLPAR	1.000	1	2	3.0	

SF3A1	splicing factor 3A subunit 1 isoform 1	FGESEEVEmEVE**S**DEEDEKQEK	1.000	1	3	4.0	
SF3B2	Splicing factor 3B subunit 2	SSLGQSA**S**ETEEDTVSISK	0.995	2	2	3.7	*
SF3B2	Splicing factor 3B subunit 2	GFEEEHKD**S**DDD**SS**DDEQEKKPEAPK	1.000	3	3	4.0	
SCAF1	Splicing factor, arginine/serine-rich 19	AP**S**PAPAM**S**PK	1.000	2	2	2.6	*
SLIRP	SRA stem-loop-interacting RNA-binding protein, mitochondrial-like	AQT**S**DEDRDF	0.998	1	2	2.8	
STARD13	stAR-related lipid transfer protein 13 isoform 1	KKGDD**S**DEEDLcISNK	1.000	1	3	4.4	*
STRN3	Striatin-3	NLEQILNGGE**S**PK	1.000	1	2	3.1	
STIM1	Stromal interaction molecule 1	LTEPQLGLG**S**QR	1.000	1	2	2.5	
SVIL	Supervillin	EMEK**S**FDEHNVPK	1.000	1	2	2.3	*
SVIL	Supervillin	GTSFPEVPR**S**PK	1.000	1	2	2.7	
SVIL	Supervillin	RG**S**LELGNPSVSHLGDEVK	1.000	1	3	4.1	*
SFR1	swi5-dependent recombination DNA repair protein 1 homolog	ScSEFQG**S**LK	1.000	1	2	2.4	*
TLN2	Talin-2	LDEG**T**PPEPK	1.000	1	2	2.6	
TBC1D17	TBC1 domain family member 17	EPSSP**S**PPISPLPLSTR	1.000	2	2	3.0	
TBC1D5	TBC1 domain family member 5	SE**S**MPVQLNK	0.997	1	2	2.4	*
RIF1	Telomere-associated protein RIF1	RQ**S**FITLEK	0.995	1	2	2.2	*
RIF1	Telomere-associated protein RIF1	VSENN**S**PDLLSQTEcESK	1.000	1	2	2.8	
RIF1	Telomere-associated protein RIF1	VTAE**S**PIQENLTEK	1.000	1	2	3.5	*
TNIK	Traf2 and NCK-interacting protein kinase	TTSI**S**PALAR	1.000	1	2	2.2	
TNIK	Traf2 and NCK-interacting protein kinase	QN**S**DPTSENPPLPTR	1.000	1	2	2.6	
TRAF3IP1	TRAF3-interacting protein 1-like	RQE**S**TETLVGDR	0.997	1	2	2.6	*
SUPT5H	Transcription elongation factor SPT5	VVSISSEHLEPI**T**PTK	0.999	1	2	2.5	*
JUN	transcription factor AP-1-like	LA**S**PELER	1.000	1	2	2.9	
Tfe3	transcription factor E3-like isoform 1	AA**S**DPLLSSVSPAVSK	1.000	1	2	2.7	
JUNB	transcription factor jun-B-like	DA**T**PPV**S**PINMEDQER	1.000	2	2	2.3	
PURB	Transcriptional activator protein Pur-beta	RGGGSGGGDE**S**EGEEVDED	1.000	1	2	3.9	*
ATRX	Transcriptional regulator ATRX	AA**S**EN**S**ENDITMQSLPK	1.000	2	2	2.3	*
ATRX	Transcriptional regulator ATRX	VcDQTAKL**S**PK	1.000	1	2	3.2	*
TLE4	Transducin-like enhancer protein 4	DAPI**S**PASVASSSSTPSSK	0.991	1	2	3.6	
TACC2	Transforming acidic coiled-coil-containing protein 2	LDNTPA**S**PPR**S**PTEPNDIPIAK	0.999	2	3	4.3	*
TMCO1	transmembrane and coiled-coil domains protein 1 isoform 1	FG**S**ADNIPNLK	1.000	1	2	2.8	
TMCO1	transmembrane and coiled-coil domains protein 1 isoform 1	ALGVISNFQS**S**PK	0.996	1	2	3.4	
TCOF1	Treacle protein	TLPV**T**PPQSTPVQSK	1.000	1	2	2.6	
TCOF1	Treacle protein	KL**S**GDQLAAGAPESK	1.000	1	2	4.7	*
N/A	Tripartite motif-containing protein 25	VTD**S**PAEEEEEAR	1.000	1	2	4.3	*
TRIM3	tripartite motif-containing protein 3	RED**S**PGPEVQPMDK	1.000	1	3	4.2	

N/A	Tripartite motif-containing protein 32	EMDMSPEEVVA**S**PR	0.995	1	2	2.4	
TRIM47	Tripartite motif-containing protein 47	GLG**S**DEDELQK	1.000	1	2	2.9	*
DUS3L	tRNA-dihydrouridine synthase 3-like	TEVAAE**S**PEQQQVPK	1.000	1	2	2.5	
TSC22D1	TSC22 domain family protein 4	VDVESGSSAAG**T**PPLSR	1.000	1	2	4.2	
TNFRSF10B	tumor necrosis factor receptor superfamily member 10B-like	APEEPEVAPEN**S**PMGR	1.000	1	2	3.5	*
TP53BP1	Tumor suppressor p53-binding protein 1	LITSEEER**S**PAK	1.000	1	2	2.8	*
TP53BP1	Tumor suppressor p53-binding protein 1	SEGDGENTQIEDTEPL**S**PVTNSK	0.995	1	3	3.8	
ABL2	Tyrosine-protein kinase ABL2	SAQASSG**S**PALPR	0.999	1	2	2.4	*
ABL2	Tyrosine-protein kinase ABL2	DK**S**PSSLLEDAK	0.999	1	2	2.8	
SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa-like	GGGG**S**GQDNGLEGLGSDGR	1.000	1	2	3.9	*
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	EEA**S**DDDmEGDEAVVR	1.000	1	2	3.9	*
UBN1	ubinuclein-1	lc**S**DEEEDEEKGGR	1.000	1	2	2.3	
N/A	uncharacterized protein C10orf47 homolog	LAGNEAL**S**PTSPSK	1.000	1	2	3.1	
KIAA1551	uncharacterized protein C12orf35 homolog	NTFLVQSV**S**PEK	1.000	1	2	3.7	
N/A	uncharacterized protein C14orf43-like isoform 1	RA**S**QEANLLTLAQK	1.000	1	3	4.4	*
TICRR	Uncharacterized protein C15orf42-like	ENFPVQSNQ**S**PK	0.997	1	2	2.3	
CACTIN	uncharacterized protein C19orf29 homolog	**S**PGATALALSQQQSLQER	0.999	1	2	3.9	
SOGA1	Uncharacterized protein C20orf117	AP**S**PTTAAGEESSK	0.999	1	2	2.5	
SOGA1	Uncharacterized protein C20orf117	TGQPPQPAPSGQQPPRPPA**S**PDEPSVAASSVGSSR	0.999	1	3	4.1	
MTCL1	Uncharacterized protein KIAA0802	EDV**T**PPL**S**PDDLK	1.000	2	2	3.3	
KIAA0947	Uncharacterized protein KIAA0947	ASGEDELLPVPG**S**PAR	1.000	1	2	3.3	
UTRN	Utrophin	AQTSLN**S**LNDLTK	1.000	1	2	3.1	
Wipf1	WAS/WASL-interacting protein family member 1-like	NL**S**LTSSAPPLPSPGR	1.000	1	2	4.4	*
WEE1	wee1-like protein kinase-like, partial	LFD**T**PH**T**PK	1.000	2	2	2.4	
WFS1	wolframin isoform 1	LNATA**S**LEQEK	1.000	1	2	2.8	
YLPM1	YLP motif-containing protein 1	NKVPG**S**PQDSQDSR	1.000	1	2	3.5	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	AAVVA**S**PLLDQQR	1.000	1	2	3.3	*
ZC3H14	Zinc finger CCCH domain-containing protein 14	DLVQPDKPA**S**PK	1.000	1	2	2.7	*
ZC3H18	zinc finger CCCH domain-containing protein 18 isoform 2	LGV**S**V**S**PSR	0.990	2	2	2.2	*
ZC3HAV1	zinc finger CCCH-type antiviral protein 1	YLGTQDcAQLSSV**S**PK	1.000	1	2	4.0	
ZNF438	zinc finger protein 828	KP**S**PSESPEPR	0.993	1	2	2.7	
ZKSCAN3	zinc finger protein with KRAB and SCAN domains 3	MEDVAPGL**S**PR	1.000	1	2	3.0	
ZFR	Zinc finger RNA-binding protein	RD**S**DGVDGFEAEGK	1.000	1	2	3.6	*
ZHX2	zinc fingers and homeoboxes protein 2-like	VAEGTADRPD**S**D**S**DSAPAEAGHA	0.999	2	3	4.3	*
ELAC2	zinc phosphodiesterase ELAC protein 2-like, partial	ALTEEPH**S**PQSK	0.995	1	2	2.7	*

Table 4.3.19: List of phosphopeptides identified following LC/MS analysis of Iron phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO BB database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
PSMD11	26S proteasome non-ATPase regulatory subunit 11	AQ**S**LLSTDR	1.000	1	2	2.3	
PDAP1	28 kDa heat- and acid-stable phosphoprotein	SLD**S**DE**S**EDEDDDYQQK	0.995	2	2	5.8	*
HMGCR	3-hydroxy-3-methylglutaryl-coenzyme A reductase	**S**KINLQDLQGTcTK	1.000	1	3	4.1	*
ASAP1	Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 1	QDEMDE**S**DDDLDDKPSPIK	1.000	1	2	2.8	
RSRC2	Arginine/serine-rich coiled-coil protein 2	EQSDVSI**S**PR	0.999	1	2	2.6	
ARMC10	Armadillo repeat-containing protein 10	**S**AEDLTDGSYDEVLNAK	1.000	1	2	5.9	*
ABCF1	ATP-binding cassette sub-family F member 1	FAALD**S**EEEDDEETTEEK	1.000	1	2	4.8	*
AVEN	Cell death regulator Aven	VEDD**S**DSETHGEENDER	1.000	1	2	3.1	*
TOP2A	DNA topoisomerase 2-alpha	AQMSEVLP**S**PHGK	1.000	1	2	2.8	*
TOP2A	DNA topoisomerase 2-alpha	SENVEG**T**PTENGLELGSLK	0.995	1	2	4.9	*
FXR1	Fragile X mental retardation syndrome-related protein 1	AINGPTSA**S**GDEIPK	0.999	1	2	3.4	*
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	QDFESL**S**PPR	0.994	1	2	2.4	
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	SQVI**S**PPLAR	1.000	1	2	2.7	
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	NQEIDcL**S**PEAQR	1.000	1	2	3.2	*
MARK3	MAP/microtubule affinity-regulating kinase 3	GIAPA**S**PMLGNASNPNK	1.000	1	2	2.8	
MTBP	Mdm2-binding protein	GEKPLVLTPEL**S**PR	1.000	1	2	3.5	*
SLC16A1	Monocarboxylate transporter 1	ATESPQQNSSGDPAEEE**S**PV	1.000	1	2	4.0	
AHNAK	Neuroblast differentiation-associated protein AHNAK	VG**S**PGVNVSAK	1.000	1	2	2.2	
AHNAK	Neuroblast differentiation-associated protein AHNAK	FGTFGGLG**S**K	1.000	1	2	2.3	
AHNAK	Neuroblast differentiation-associated protein AHNAK	GSGIGLHDV**S**VK	1.000	1	2	2.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	FNF**S**GSK	1.000	1	2	2.4	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	LQG**S**GVSLASK	1.000	1	2	2.4	
AHNAK	Neuroblast differentiation-associated protein AHNAK	MP**S**LDISAPK	1.000	1	2	2.7	
AHNAK	Neuroblast differentiation-associated protein AHNAK	ISMQDVDLSVG**S**cK	1.000	1	2	2.9	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	AE**S**PEVDVNLPK	1.000	1	2	3.0	
AHNAK	Neuroblast differentiation-associated protein AHNAK	VEVS**T**PEVSVEGPEGK	0.992	1	2	3.0	
AHNAK	Neuroblast differentiation-associated protein AHNAK	GGVTG**S**PEASISGSK	0.999	1	2	3.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	FKAEASLP**S**PK	0.997	1	2	3.5	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	VK**S**DVDVSLPK	1.000	1	2	4.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GHYEVTG**S**DDEAVK	0.996	1	2	4.4	*

AHNAK	Neuroblast differentiation-associated protein AHNAK	I**S**MADVDLNVASPK	1.000	1	2	4.4	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GP**S**VDIDTPDVNIEGPEGK	1.000	1	2	5.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GP**S**VDVEVPDVDLEcPDAK	1.000	1	2	5.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	ASLG**S**LEGEADAEASSPK	1.000	2	2	5.5	*
SPG7	paraplegin	AAEAISF**S**R	1.000	1	2	2.5	
INPPL1	Phosphatidylinositol-3,4,5-trisphosphate 5-phosphatase 2	DA**S**DVEDEKPPLPPR	1.000	1	2	2.5	*
NDRG1	Protein NDRG1	TA**S**GSSVTSLEGPR	0.992	1	2	4.5	
PPP1R2	Protein phosphatase inhibitor 2	TSAA**S**PVVASAEQPR	1.000	1	2	2.9	*
RFC2	Replication factor C subunit 2	AQEP**S**PVPSK	1.000	1	2	2.6	
LEO1	RNA polymerase-associated protein LEO1	KLN**S**DEEGESSGKR	1.000	1	2	2.6	
SRSF2	Serine/arginine-rich splicing factor 2	**S**K**S**PPKSPEEEGAVSS	1.000	3	2	2.3	*
SIPA1L3	Signal-induced proliferation-associated 1-like protein 3	TL**S**DESLcSGR	0.991	1	2	2.7	*
SF3B1	Splicing factor 3B subunit 1	GGDSIGE**T**PTPGASK	1.000	2	2	2.3	
STMN1	Stathmin	RK**S**HEAEVLK	1.000	1	2	2.7	*
STMN1	Stathmin	ESVPDFPL**S**PPK	1.000	1	2	3.0	
TSC22D3	TSC22 domain family protein 3	QD**S**LEPVLR	1.000	1	2	2.2	
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	GHLHG**SS**DD**S**EVEDEAKDTLPSQK	1.000	3	3	4.1	*
AEBP2	Zinc finger protein AEBP2	RG**S**LEMSSDGEPLSR	1.000	1	2	2.7	*
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	EVEDKE**S**EGEDEDEDEDLSK	1.000	1	2	2.8	*
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	YNLDA**S**EEEDSNK	1.000	1	2	4.9	*

Table 4.3.20: List of phosphopeptides identified following LC/MS analysis of Titanium Dioxide phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be common to CHO BB and CHO NCBI protein databases.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
TNKS1BP1	182 kDa tankyrase-1-binding protein	DTGQLEEGESGGLL**S**PSmPK	0.999	1	3	3.9	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	D**S**LGSFSTR	1.000	1	2	2.2	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	TEAQDPcRV**S**PEPTGPER	1.000	1	3	4.2	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	VP**SS**DEEVVEEPQSR	1.000	2	2	4.7	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	RD**S**LLDIR	1.000	1	2	2.4	
PSMD9	26S proteasome non-ATPase regulatory subunit 9	LGSN**S**PVLPQAFAK	1.000	1	2	3.2	*
RPS27	40S ribosomal protein S27	DLLHP**S**PEEEK	1.000	1	2	2.7	
RPS3	40S ribosomal protein S3	DEILPT**T**PISEQK	0.994	1	2	2.5	
XRN2	5'-3' exoribonuclease 2	AED**S**D**S**EPEPEDNVR	1.000	2	2	3.5	*
NMD3	60S ribosomal export protein NMD3	DSTVPVESD**T**DDEGAPR	0.999	1	2	2.9	
RPL12	60S ribosomal protein L12	IGPLGL**S**PK	1.000	1	2	2.7	
RPL14	60S ribosomal protein L14	AAILKA**S**PK	1.000	1	2	2.7	
RPL4	60S ribosomal protein L4	ILK**S**PEIQR	1.000	1	2	2.3	
ABI1	Abl interactor 1	TNPPTQKPP**S**PPVSGR	1.000	1	2	2.4	
ANLN	Actin-binding protein anillin	LLTSIT**S**K	0.994	1	2	2.4	
ANLN	Actin-binding protein anillin	SREPLSEASNQQPL**S**GGEEK	1.000	1	3	4.7	*
ARPC1B	Actin-related protein 2/3 complex subunit 1B	KA**S**SEGGASTGAGLDSLHK	0.992	1	3	3.8	*
AHSA2	Activator of 90 kDa heat shock protein ATPase homolog 2	VTGNPLQA**S**PVALGVR	1.000	1	2	3.3	
ARL6IP4	ADP-ribosylation factor-like protein 6-interacting protein 4	**S**AGEDDGPVLTDEQK	1.000	1	2	4.1	*
MLLT4	Afadin	TS**S**VVTLEVAK	1.000	1	2	3.3	
MLLT4	Afadin	TI**S**NPEVVmK	1.000	1	2	2.5	*
AKAP1	A-kinase anchor protein 1, mitochondrial	LPKPD**S**LQNVQASSNPK	1.000	1	3	4.3	*
AKAP12	A-kinase anchor protein 12	GLSEAQQEGEAEEGAT**S**DGEK	0.999	1	2	5.4	*
AKAP12	A-kinase anchor protein 12	NAE**S**PTSPVSGETTSSFK	1.000	1	2	4.2	*
AARSD1	Alanyl-tRNA editing protein Aarsd1	GAQADHFTQTPL**S**PGSQVQVR	1.000	1	3	4.8	*
AMPD2	AMP deaminase 2	TD**S**DSDLQLYK	1.000	1	2	3.0	*
ANAPC1	Anaphase-promoting complex subunit 1	SP**S**ISNmAALSR	1.000	1	2	3.2	*
ANKRD17	Ankyrin repeat domain-containing protein 17	AP**S**PASSSVPLGSEKPSNVSQDR	1.000	1	3	4.1	
ANK3	Ankyrin-3	RQ**S**FASLALR	1.000	1	2	2.5	*
AP1AR	AP-1 complex-associated regulatory protein	SK**T**EEDILR	0.999	1	2	2.6	
AP3B1	AP-3 complex subunit beta-1	NFYE**S**DDEEKEK	1.000	1	2	3.2	*

AP3D1	AP-3 complex subunit delta-1	HS**S**LP**T**E**S**DEDIAPAQR	1.000	3	2	4.8	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SQ**S**PSPPSLSEDLEK	0.998	2	2	2.8	
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	GL**S**PLSSTLDTK	1.000	1	2	2.2	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	SSFSEEKGE**S**DDEKPR	1.000	1	2	3.4	*
ACIN1	Apoptotic chromatin condensation inducer in the nucleus	TAQVP**S**PPR	1.000	1	2	2.3	
GIT1	ARF GTPase-activating protein GIT1	HG**S**GADSDYENTQSGDPPLGLEGK	1.000	1	3	5.8	
ASAP2	Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2	LLHEDLDE**S**DDDVDEK	1.000	1	2	5.7	*
RERE	Arginine-glutamic acid dipeptide repeats protein	TQEI**S**RPN**S**PSEGEGESSDSR	0.999	2	3	4.8	*
RERE	Arginine-glutamic acid dipeptide repeats protein	KQPA**S**PDGRA**S**PINEDIR	1.000	2	3	4.0	*
PEA15	Astrocytic phosphoprotein PEA-15	DIIRQP**S**EEEIIK	1.000	1	2	2.6	*
ATXN2L	Ataxin-2-like protein	EVDGLLTSDPmG**S**PVSSK	1.000	1	2	4.7	*
ABCF1	ATP-binding cassette sub-family F member 1	AV**S**EEQQPGLR	1.000	1	2	3.0	*
ACLY	ATP-citrate synthase	AKPAmPQDSVP**S**PR	1.000	1	2	3.5	*
DDX18	ATP-dependent RNA helicase DDX18	KLPQKPTTLTNGETAATP**S**PDSEPK	1.000	1	3	4.3	*
DDX24	ATP-dependent RNA helicase DDX24	VGAAAHLG**S**PPR	1.000	1	2	2.4	*
DDX54	ATP-dependent RNA helicase DDX54	IDDRD**S**EDEGSFNQR	1.000	1	3	4.2	*
ARID1A	AT-rich interactive domain-containing protein 1A	TLLDPGRF**S**K	1.000	1	2	2.4	*
ATN1	Atrophin-1	SEEV**S**ESESEETSAPK	1.000	1	2	3.5	
BAG3	BAG family molecular chaperone regulator 3	GKK**S**PENEDPQTESQQPEAK	1.000	1	3	3.9	
BAG3	BAG family molecular chaperone regulator 3	AAP**S**PPPAEAAAPKPEAEAPAK	1.000	1	2	2.8	
EPB41L2	Band 4.1-like protein 2	GSQPGPAVESQS**S**PR	0.999	1	2	2.9	
EPB41L2	Band 4.1-like protein 2	EVTENEQNQL**S**EPEEGK	1.000	1	2	3.5	
BCLAF1	Bcl-2-associated transcription factor 1	IDI**S**PSALR	1.000	1	2	3.3	
BCLAF1	Bcl-2-associated transcription factor 1	NTPSQHSHSIQH**S**PER	1.000	1	2	2.8	*
BCLAF1	Bcl-2-associated transcription factor 1	FND**S**EGDDTEETEDYR	1.000	1	2	4.8	*
BCLAF1	Bcl-2-associated transcription factor 1	AEGEPQEE**S**PLK	1.000	1	2	2.8	
BET1	BET1 homolog	SL**S**IEIGHEVK	1.000	1	2	3.1	*
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	RG**S**ISQEITK	1.000	1	2	2.8	*
CDCA8	Borealin	EQIYNVSING**S**PLADSK	0.999	1	2	4.2	*
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SI**S**TVDLTEK	0.992	1	2	3.1	
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	SV**S**VATGLNmmK	1.000	1	2	3.2	*
Brca1	Breast cancer type 1 susceptibility protein homolog	RA**S**DPFPEEK	1.000	1	2	3.4	*

FAM175B	BRISC complex subunit Abro1	FSG**S**GADLLPSQR	1.000	1	2	2.5	
BAZ2A	Bromodomain adjacent to zinc finger domain protein 2A	RPSGDSEEmPQ**S**PTGLGQPK	1.000	1	3	4.1	
BRD2	Bromodomain-containing protein 2	KADTTTPTPTAmLAPG**S**PA**S**PPGSLEPK	0.993	2	3	5.0	
BUD13	BUD13 homolog	HD**S**PDLELPR	1.000	1	2	2.7	*
CAD	CAD protein	A**S**DPGLPAEEPK	1.000	1	2	2.6	*
CAMK2D	Calcium/calmodulin-dependent protein kinase type II subunit delta	NF**S**AAK**S**LLK	1.000	2	2	2.6	
CARHSP1	Calcium-regulated heat stable protein 1	DR**S**P**S**PLRGNVVP**S**PLPTR	1.000	3	3	3.9	*
PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	EDEI**S**PPPPNPVVK	1.000	1	2	2.8	
PRKAR2A	cAMP-dependent protein kinase type II-alpha regulatory subunit	RV**S**VcAESYNPDEEEEDTEPK	1.000	1	3	4.1	
CAT	Catalase	**S**LQKPDVLTTGGGNPIGDK	1.000	1	2	3.2	*
CEBPZ	CCAAT/enhancer-binding protein zeta	SQLDDHPE**S**DEENFVDVRDD**S**DIEK	1.000	2	3	5.1	*
CEBPZ	CCAAT/enhancer-binding protein zeta	NEDED**S**IEDVDDKEFEK	1.000	1	2	5.1	*
CCNL2	Ccnl2-004	TD**S**PVNGLPK	1.000	1	2	2.2	*
CD2AP	CD2-associated protein	**S**VDFDALLVR	1.000	1	2	2.8	
CD44	CD44 antigen	**S**QEmVHLVNK	1.000	1	2	2.8	*
CDC42EP1	Cdc42 effector protein 1	TA**S**PPAPSPAPPAISPIIK	0.994	1	2	3.5	
CDC42EP1	Cdc42 effector protein 1	SD**S**LLSFR	1.000	1	2	2.6	
CDC42EP2	Cdc42 effector protein 2	LHLE**S**PQP**S**PK	1.000	2	2	3.4	*
CEP170	Centrosomal protein of 170 kDa	LGEA**S**DSELADADK	1.000	1	2	4.5	*
CHMP2B	Charged multivesicular body protein 2b	ATI**S**DEEIER	1.000	1	2	2.4	
CLCC1	Chloride channel CLIC-like protein 1	EIGELPGESTPTEHSSSATAVSGQAAGTAEG**S**PIK	1.000	1	3	5.6	
BAP18	Chromatin complexes subunit BAP18	VYEDSGVPLPTE**S**PK	0.999	1	2	2.8	
CBX5	Chromobox protein homolog 5	TADSSS**S**EDEEEYVVEK	0.992	1	2	4.7	
CBX5	Chromobox protein homolog 5	KS**S**FSNSADDIK	1.000	1	2	4.0	*
CDYL	Chromodomain Y-like protein	ILVPK**S**PVK	1.000	1	2	2.3	*
COPA	Coatomer subunit alpha	NL**S**PGAVESDVR	1.000	1	2	4.1	
CCDC86	Coiled-coil domain-containing protein 86	ALLEFESNPEETSEPK**S**PR	0.998	1	2	2.5	*
CCDC86	Coiled-coil domain-containing protein 86	VQPLETSPG**S**PcLK	1.000	1	2	2.3	
ZCCHC3	Cold shock domain-containing protein E1	NI**S**LDDASAPR	1.000	1	2	3.6	*
NCAPD2	Condensin complex subunit 1	RQPLTSID**S**DNDFVTPKPR	0.996	2	3	4.1	*
NCAPG	Condensin complex subunit 3	AIQcEDEEIN**S**DDEQEAK	1.000	1	2	5.1	*
NCAPD3	Condensin-2 complex subunit D3	SLGALPFSVESG**S**PEK	1.000	1	2	4.4	*
COBLL1	Cordon-bleu protein-like 1	EQTA**S**APATPLVSK	0.998	1	2	2.7	
CTTNBP2NL	CTTNBP2 N-terminal-like protein	DL**S**PTLLDNSAAK	0.999	1	2	3.0	
ATF2	Cyclic AMP-dependent transcription factor ATF-2	NDSVIVADQ**T**P**T**PTR	1.000	2	2	3.7	
CDK11A	Cyclin-dependent kinase 11	DLLSDLQDI**S**DSER	1.000	1	2	4.4	*

CDK11A	Cyclin-dependent kinase 11	RD**S**LEEGELR	1.000	1	2	3.0	*
CDK12	Cyclin-dependent kinase 12	NS**S**PAPPQPAPVK	0.998	1	2	2.7	
CDK13	Cyclin-dependent kinase 13	HS**S**I**S**PSTLTLK	0.996	2	2	2.9	*
CDK16	Cyclin-dependent kinase 16	RV**S**LSEIGFGK	0.994	1	2	3.3	*
CDK16	Cyclin-dependent kinase 16	RL**S**LPADIR	1.000	1	2	2.2	
CDK17	Cyclin-dependent kinase 17	RI**S**mEDLNK	1.000	1	2	2.8	*
GAK	Cyclin-G-associated kinase	DGSEV**S**DEEEPPFPSEAR	1.000	1	2	3.0	
CCNK	Cyclin-K	TVVV**S**PKEENK	1.000	1	2	3.5	*
CCNL1	Cyclin-L1	AEEK**S**PISINVK	1.000	1	2	3.4	*
DYNC1LI1	Cytoplasmic dynein 1 light intermediate chain 1	KPASV**S**PTTPTSPTEGEAS	0.993	1	2	3.5	
PLA2G4A	Cytosolic phospholipase A2	HIVSNDSSD**S**DDEAQAPK	1.000	1	2	5.0	*
DCAF8	DDB1- and CUL4-associated factor 8	VHDH**S**EEEEEEQPLHR	1.000	1	3	4.8	*
DOCK1	Dedicator of cytokinesis protein 1	**S**QVINVIGSER	1.000	1	2	2.7	
DENND4C	DENN domain-containing protein 4C	RS**S**LPLEHGPPAQDSPDIEK	0.999	1	3	5.3	*
DAB2	Disabled homolog 2	**S**ADNSLENPFSK	1.000	1	2	3.7	*
DNMT1	DNA (cytosine-5)-methyltransferase 1	EAESEQmTLE**S**AEDG**S**EEEEREEK	0.991	2	3	4.9	*
DNMT1	DNA (cytosine-5)-methyltransferase 1	EADDDEEVDDDIPEVP**S**PK	1.000	1	2	3.4	
DFFA	DNA fragmentation factor subunit alpha	KNPLPGEQQ**S**PKR	1.000	1	2	2.8	*
LIG1	DNA ligase 1	AAQVL**SS**EGEEEDEAPSTPK	1.000	2	2	4.8	*
MSH6	DNA mismatch repair protein Msh6	SEKDNP**S**E**S**EEELQPK	1.000	2	2	3.8	*
XPC	DNA repair protein complementing XP-C cells homolog	SEAVAPHANAGGGL**SS**DEEEGTSSQAEAAR	1.000	2	3	4.8	*
MCM2	DNA replication licensing factor MCM2	ISDPLT**SS**PGR	0.997	2	2	3.1	
MCM2	DNA replication licensing factor MCM2	GLLYD**S**DEEDEERPAR	1.000	1	2	3.1	*
MCM3	DNA replication licensing factor MCM3	KP**S**EDE**S**DLEDEEEK	1.000	1	2	3.7	
TOP2B	DNA topoisomerase 2-beta	VVETVN**S**D**S**DSEFGIPK	0.998	2	2	5.4	*
TOPBP1	DNA topoisomerase 2-binding protein 1	NTSTLSA**S**PQLK	0.999	1	2	2.7	
DNAJC2	DnaJ homolog subfamily C member 2	NA**S**TSFQELEDK	0.993	1	2	2.4	
DBN1	Drebrin	LS**S**PVLHR	1.000	1	2	2.3	
DBNL	Drebrin-like protein	QL**T**QPEVSYGR	1.000	1	2	2.3	
DYRK1A	Dual specificity tyrosine-phosphorylation-regulated kinase 1A	IYQ**Y**IQSR	1.000	1	2	2.6	
DNM1L	Dynamin-1-like protein	SKPIPImPA**S**PQK	1.000	1	2	3.1	*
PIAS1	E3 SUMO-protein ligase PIAS1	GILSLPHQA**S**PVSR	0.998	1	2	2.9	*
RNF20	E3 ubiquitin-protein ligase BRE1A	ALVVPEPEPDSD**S**NQER	1.000	1	2	3.2	
NEDD4	E3 ubiquitin-protein ligase NEDD4	QI**S**EEVDSADNR	1.000	1	2	3.4	*
RBBP6	E3 ubiquitin-protein ligase RBBP6	VEGAEIVKP**S**PK	1.000	1	2	3.6	*
TOPORS	E3 ubiquitin-protein ligase Topors	LQQNVPADA**S**PDSK	1.000	1	2	2.4	
EEF1B2	Elongation factor 1-beta	DDDDIDLFG**S**DDEEESEEAK	1.000	1	2	5.2	*

EEF1D	Elongation factor 1-delta	AA**T**PAEDDEDDDIDLFG**S**DEEEEDKEAAR	1.000	2	3	6.5	*
EFS	Embryonal Fyn-associated substrate	LP**S**TESLSR	0.996	1	2	3.0	
IRF2BPL	Enhanced at puberty protein 1	NSS**S**PV**S**PASVPGQR	0.997	2	2	3.0	*
EPS15	Epidermal growth factor receptor substrate 15	LD**S**SDPFK	1.000	1	2	2.5	
ESF1	ESF1 homolog	DSL**SS**EEEADLEK	1.000	2	2	4.4	*
EIF3A	Eukaryotic translation initiation factor 3 subunit A	LE**S**LNIQR	1.000	1	2	2.3	
EIF3B	Eukaryotic translation initiation factor 3 subunit B	EHSVAGAEEEGG**S**DG**S**SPEAEPR	1.000	2	3	4.5	*
EIF3C	Eukaryotic translation initiation factor 3 subunit C	RPLLL**S**EDEEDTK	1.000	1	2	2.4	*
EIF4G2	Eukaryotic translation initiation factor 4 gamma 2	TQ**T**PPLGQTPQLGLK	1.000	1	2	3.0	
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PVAATVVQR	1.000	1	2	2.4	*
SLC1A3	Excitatory amino acid transporter 1	DVEmGN**S**VIEENEmK	1.000	1	2	4.5	
FBXO28	F-box only protein 28	EVmESAVGTSSGSGQSEE**S**PR	1.000	1	3	4.0	
FOXJ3	Forkhead box protein J3	VTLYNTDQDGSD**S**PR	1.000	1	2	4.0	
FOXK2	Forkhead box protein K2	EG**S**PAPVEPEPGAAQPK	1.000	1	2	3.4	
FNBP1L	Formin-binding protein 1-like	TI**S**DGTISASK	1.000	1	2	2.4	*
FNBP4	Formin-binding protein 4	ALEEGDGSVSGS**S**PR	0.999	1	2	3.3	
FNBP4	Formin-binding protein 4	VDEN**S**DKEAEVEESSEK	1.000	1	3	5.6	*
GPATCH8	G patch domain-containing protein 8	GPKPEPPGSG**S**PAPPR	1.000	1	2	3.1	*
GCFC2	GC-rich sequence DNA-binding factor	EGQNIDL**S**PK	1.000	1	2	2.4	
GTF3C4	General transcription factor 3C polypeptide 4	ILLVD**S**PGmGDGEDEQQEEGTSK	1.000	1	3	3.8	
GPI	Glucose-6-phosphate isomerase	SN**S**PIVVDSR	1.000	1	2	2.3	
GOLIM4	Golgi integral membrane protein 4	AE**S**HEPGHQEADTEAEADR	1.000	1	3	4.2	*
GOLGA4	Golgin subfamily A member 4	VP**S**VESLFR	1.000	1	2	2.6	*
GPN1	GPN-loop GTPase 1	GTLDEEDEEAE**S**DTDDIDHR	1.000	1	3	4.1	*
GAPVD1	GTPase-activating protein and VPS9 domain-containing protein 1	SR**S**SDIVSSVR	1.000	1	2	3.1	*
DKC1	H/ACA ribonucleoprotein complex subunit 4	TVLE**S**GGEAGDGD**S**DTTK	1.000	2	2	3.8	*
HSPA4	Heat shock 70 kDa protein 4	mQVDQEEPHAEEQQPQ**T**PAENKVESEEmETSQAGS K	1.000	1	4	4.4	
HSPA4	Heat shock 70 kDa protein 4	HAEQNGPVDGQGD**S**PGPQAAEQGADTAVPSDADK	1.000	1	3	5.0	
HSPH1	Heat shock protein 105 kDa	IE**S**PKLER	1.000	1	2	2.4	*
HSP90AA1	Heat shock protein HSP 90-alpha	ESDDKPEIEDVG**S**DEEEEEK	1.000	1	2	2.6	*
SKIV2L	Helicase SKI2W	AS**S**LEDLVLK	1.000	1	2	2.6	
MET	Hepatocyte growth factor receptor	DLG**S**ELVR	1.000	1	2	2.2	
HDGF	Hepatoma-derived growth factor	AGDmLED**S**PKRPK	1.000	1	2	2.5	*
HDGF	Hepatoma-derived growth factor	GNAEG**SS**DEEGKLVIDEPAK	1.000	2	3	4.3	*
HDGFRP2	Hepatoma-derived growth factor-related protein 2	VmTVTAVTTTAT**S**DR	0.998	1	2	3.6	
HNRNPCL1	Heterogeneous nuclear ribonucleoprotein C	mESEAGADD**S**AEEGDLLDDDDNEDR	1.000	1	2	5.1	*
HNRNPH2	Heterogeneous nuclear ribonucleoprotein H2	HTGPN**S**PDTANDGFVR	1.000	1	2	3.3	*

HNRNPUL2	Heterogeneous nuclear ribonucleoprotein U-like protein 2	**S**GDETPGSEAPGDKATEEQGDDQDSEK	0.996	1	3	4.8	
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	QADL**S**FSSPVEmK	1.000	1	2	2.4	
HMGA1	High mobility group protein HMG-I/HMG-Y	KQPPKEPSEVP**T**PK	1.000	1	2	2.6	
Q13547	Histone deacetylase 1	IAcEEEF**S**D**S**DEEGEGGRK	1.000	2	3	4.2	*
Q13547	Histone deacetylase 1	mLPHAPGVQmQAIPEDAIPEE**S**GDEDEEDPDKR	1.000	1	3	4.6	*
Htatsf1	HIV Tat-specific factor 1 homolog	LYEDD**S**DKELEENGVK	1.000	1	2	4.3	*
Htatsf1	HIV Tat-specific factor 1 homolog	VFDDE**S**DENEDEEEAEEK	1.000	1	2	5.9	*
HMGCS1	Hydroxymethylglutaryl-CoA synthase, cytoplasmic	RPSTNDHNLGDGVGLVHSNTATEHIP**S**PAK	1.000	1	4	5.1	
KPNA2	Importin subunit alpha-2	NVSSFPDDAT**S**PLQENR	0.999	1	2	4.9	
KPNA4	Importin subunit alpha-3	NVPQEESLED**S**DVDADFK	1.000	1	2	4.4	
IRF2BP2	Interferon regulatory factor 2-binding protein 2	KP**S**PEPEGEVGPPK	1.000	1	2	3.3	
SLC4A1AP	Kanadaptin	mLGED**S**DEEEETDTTEGK	1.000	1	2	6.2	*
KLC2	Kinesin light chain 2	AS**S**LNFLNK	0.995	1	2	2.4	
KIF23	Kinesin-like protein KIF23	YmLTHQELA**S**DGEIQTK	1.000	1	3	4.7	*
NUF2	Kinetochore protein Nuf2	IVD**S**PEKVK	1.000	1	2	2.3	
LARP1B	La-related protein 1B	LDGPVENV**S**EDEAQSSSQR	1.000	1	2	4.5	*
LARP4	La-related protein 4	SSSGSEHSTEGSVSLGDGPL**S**R	1.000	1	3	4.2	*
BAG6	Large proline-rich protein BAT3	ENA**S**PAPGTTAEEAmSR	1.000	1	2	3.4	
DBR1	Lariat debranching enzyme	SGETVE**S**GDEKDLSEFPVK	0.997	1	2	3.4	*
LUZP1	Leucine zipper protein 1	**S**QENIPQGFSVPNK	1.000	1	2	2.8	
LUZP1	Leucine zipper protein 1	EKPD**S**DDDLDIESLVTAK	1.000	1	2	3.0	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	RG**S**GDTSISmDTEASIR	1.000	1	2	2.4	*
LRRC16A	Leucine-rich repeat-containing protein 16A	RS**S**GLISELPSEEGK	0.999	1	2	3.5	*
LIMA1	LIM domain and actin-binding protein 1	SEAQQPVHTKPL**S**PDAR	1.000	1	2	2.3	*
LIMA1	LIM domain and actin-binding protein 1	**S**LDDLEIGLGHLSSSSFNSEK	1.000	1	3	5.1	*
LMO7	LIM domain only protein 7	**S**mSDVSAEDIQNLR	0.994	1	2	4.4	*
LMO7	LIM domain only protein 7	SR**S**TTELNDAATEK	0.994	1	2	4.6	*
LMO7	LIM domain only protein 7	SA**S**VNKEPlcLPGImR	0.995	1	3	5.2	*
PPFIBP1	Liprin-beta-1	GSQGTSPFQmSPP**S**PDSK	0.999	1	2	3.4	*
KDM2A	Lysine-specific demethylase 2A	GDEEGLGGEEEEEEEEEDD**S**AEEGGAAR	1.000	1	3	4.4	
MELK	Maternal embryonic leucine zipper kinase	GTNVFG**S**LER	1.000	1	2	2.7	
MELK	Maternal embryonic leucine zipper kinase	**S**mEVDLNQAHmEDTPK	1.000	1	2	3.3	
MED1	Mediator of RNA polymerase II transcription subunit 1	SQ**T**PPGVATPPIPK	0.999	1	2	3.0	
MED24	Mediator of RNA polymerase II transcription subunit 24	LLSTNEDDANILS**S**PTDR	0.995	1	2	4.6	
PGRMC1	Membrane-associated progesterone receptor component 1	LLKEGEEPTVY**S**DDEDPKDENAR	1.000	1	3	4.5	*
MTA1	Metastasis-associated protein MTA1	LPEASQ**S**PLVLK	0.999	1	2	3.7	*

MTA1	Metastasis-associated protein MTA1	SAPVINNG**S**PTILGK	1.000	1	2	2.8	
MTA1	Metastasis-associated protein MTA1	NNm**S**PHGIPAR	1.000	1	2	2.4	*
MECP2	Methyl-CpG-binding protein 2	AETSESSGSAPAVPEASA**S**PK	1.000	1	2	4.9	
METTL10	Methyltransferase-like protein 10	EG**S**PVAADFVPSALGTR	1.000	1	2	4.5	
DGCR8	Microprocessor complex subunit DGCR8	YGVD**S**DHP**S**DGETSVQPmmTK	1.000	2	3	5.0	*
MAP1B	Microtubule-associated protein 1B	SPSLSPSPP**S**PIEK	0.998	1	2	3.8	*
MAP1B	Microtubule-associated protein 1B	AQSLEGEKL**S**PK	1.000	1	2	3.4	*
TOMM34	Mitochondrial import receptor subunit TOM34	VP**S**AGDVER	1.000	1	2	2.3	*
MAPK6	Mitogen-activated protein kinase 6	GHL**S**EGLVTK	1.000	1	2	2.8	
MAP3K7	Mitogen-activated protein kinase kinase kinase 7	**S**IQDLTVTGTEPGQVSSR	1.000	1	2	3.8	
MAP3K5	Mitogen-activated protein kinase kinase kinase kinase 5	TA**S**EINFDK	1.000	1	2	3.0	
N/A	MLL1/MLL complex subunit KIAA1267	L**S**PSTDSSSNLTNVK	1.000	1	2	2.9	*
MORC2	MORC family CW-type zinc finger protein 2A	SLAV**S**DEEEAEEEAEK	1.000	1	2	4.4	*
ABCC4	Multidrug resistance-associated protein 4	TENEEAEHP**S**ASGTPTLR	0.999	1	2	2.6	*
MVB12A	Multivesicular body subunit 12A	GL**S**LDPPTQPSK	1.000	1	2	2.8	*
MYBBP1A	Myb-binding protein 1A	DVPSDSQ**S**PISQK	0.998	1	2	2.5	
MYBBP1A	Myb-binding protein 1A	SP**S**LLQSVVK	1.000	1	2	3.1	*
MYBBP1A	Myb-binding protein 1A	K**S**PQSALPR	1.000	1	2	2.5	
MYBBP1A	Myb-binding protein 1A	LSQVNGG**T**PV**S**PIEPEGK	1.000	2	2	3.8	*
BIN1	Myc box-dependent-interacting protein 1	SP**S**PPPDGSPAATPEIR	0.999	1	2	2.6	
BIN1	Myc box-dependent-interacting protein 1	VNHEPEPASGA**S**PGATIPK	1.000	1	3	4.1	*
MLF2	Myeloid leukemia factor 2	LAIQGPED**S**PSR	0.999	1	2	2.3	
MPRIP	Myosin phosphatase Rho-interacting protein	SK**S**NPDFLKK	0.999	1	2	2.5	*
MYH10	Myosin-10	GGPISFSS**S**R	0.998	1	2	2.3	
MYH10	Myosin-10	QLHIEGA**S**LEL**S**DDDTESK	1.000	2	3	4.8	*
MYO9B	Myosin-IXb	RK**S**DPGAEPGHFGVcVDSLTSDK	1.000	1	4	4.5	
MYO18A	Myosin-XVIIIa	FSHSYL**S**D**S**DTEAKPTETNA	0.990	2	2	4.8	*
MYO18A	Myosin-XVIIIa	SLAPDP**S**DDENGPVDSTSRPR	1.000	1	2	2.2	
MTMR9	Myotubularin-related protein 9	QLAELETEDGLRE**S**P	1.000	1	2	3.2	
NACA	Nascent polypeptide-associated complex subunit alpha	VQGEAVSNIQENTQTPTVQEE**S**EEEEVDETGVEVK	0.993	1	3	5.4	
NELFE	Negative elongation factor E	SV**S**ADEDLQESSR	1.000	1	2	4.5	*
NGDN	Neuroguidin	LN**S**EDEEEDEAEEDQSEAAGK	1.000	1	2	6.7	*
SLC1A4	Neutral amino acid transporter A	SEEETSPLVTHQNPSG**S**LVTAPELESK	1.000	1	3	5.8	*
SLC1A5	Neutral amino acid transporter B(0)	TPS**S**EPELIQVK	0.992	1	2	3.5	*
NAB2	NGFI-A-binding protein 2	SF**S**PK**S**PLELGEK	1.000	2	2	2.9	*
NIPBL	Nipped-B-like protein	AITSLLGGG**S**PK	1.000	1	2	2.9	*
HMGN1	Non-histone chromosomal protein HMG-14	QAEAADQQTTDLPAENGETENQ**S**PA**S**EVEEK	1.000	2	3	4.9	

NSFL1C	NSFL1 cofactor p47	RH**S**GQDVHVVLK	1.000	1	2	2.4	*
NSFL1C	NSFL1 cofactor p47	**S**PNELVDDLFK	1.000	1	2	3.2	*
NASP	Nuclear autoantigenic sperm protein	SLSKPE**T**DTEQESEVEK	1.000	1	2	4.6	*
NASP	Nuclear autoantigenic sperm protein	AALEQLSGQDVKV**S**PK	1.000	1	2	3.8	*
NFIC	Nuclear factor 1 C-type	SPFNSP**S**PQDSPR	1.000	1	2	3.2	*
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	SL**S**SDEATNPISR	0.992	1	2	4.3	*
NUDC	Nuclear migration protein nudC	NGSLD**S**PGKQDAEEEEEEDEKDK	1.000	1	3	3.8	*
NUP88	Nuclear pore complex protein Nup88	EDAEVAE**S**PLR	1.000	1	2	2.4	
NCOR2	Nuclear receptor corepressor 2	**S**PGNTSQPPAFFSK	0.996	1	2	3.1	
NRBP1	Nuclear receptor-binding protein	TP**T**PEPAEVETR	1.000	1	2	3.3	
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	TPSPKEEDEEAE**S**PPEKK	1.000	1	3	4.8	*
ZC3HC1	Nuclear-interacting partner of ALK	SmGTGDSAGLEVPS**S**PLRK	1.000	1	3	4.0	*
NOL11	Nucleolar protein 11	KK**S**ETNLQAEVPGSK	1.000	1	2	3.4	*
NOP14	Nucleolar protein 14	HNDIVD**S**DNDTEER	1.000	1	2	4.6	*
NOP14	Nucleolar protein 14	FGEYNSNI**S**PEEK	1.000	1	2	4.0	*
NOP56	Nucleolar protein 56	EELP**S**DSEEVATcSVSVPK	0.999	1	2	3.9	*
NOP56	Nucleolar protein 56	EEmV**S**DPEEAA**S**PIIPK	1.000	2	2	4.0	*
NOP58	Nucleolar protein 58	HIKEEPL**S**DEEPcTSTAIPSPEK	1.000	1	3	3.8	*
DDX21	Nucleolar RNA helicase 2	IEEP**S**EEDADVPKPR	1.000	1	2	3.2	*
NPM1	Nucleophosmin	GPS**S**VEDIK	1.000	1	2	2.4	
NPM1	Nucleophosmin	cGSGPVHISGQHLVAVEEDAE**S**EDEDEEDVK	1.000	1	3	6.5	*
NPM3	Nucleoplasmin-3	IVcINNDL**S**EE**S**EDDESEEGEVK	0.998	2	3	4.2	
NDC1	Nucleoporin NDC1	KLN**S**PEETTFQTPK	1.000	1	2	2.4	*
NME2	Nucleoside diphosphate kinase B	NIIHG**S**DSVQSAEK	1.000	1	2	3.1	*
OTUD4	OTU domain-containing protein 4	TP**S**QIIR	1.000	1	2	2.4	
OTUD4	OTU domain-containing protein 4	EE**SS**EDENEVSNILK	1.000	2	2	4.2	*
OSBPL2	Oxysterol-binding protein-related protein 2	mDD**S**PEKANSDVPGDmTDDVPVAQETVQVIPGSK	1.000	1	3	4.5	
SIN3A	Paired amphipathic helix protein Sin3a	GDL**S**DVEEEEEEEmDVDEATGAPK	1.000	1	2	6.4	*
PALLD	Palladin	SRD**S**GDENEPIQER	0.990	1	2	3.6	*
PSIP1	PC4 and SFRS1-interacting protein	QVETEESGmVAAATASSNLKA**S**PK	1.000	1	2	3.5	
PCM1	Pericentriolar material 1 protein	NVR**S**DV**S**DQEEDEESER	1.000	2	2	3.3	*
PCNP	PEST proteolytic signal-containing nuclear protein	DTPTSAGPN**S**FNK	0.996	1	2	3.0	
PHF3	PHD finger protein 3	mAPPVDDL**S**PK	1.000	1	2	2.3	
FARSA	Phenylalanyl-tRNA synthetase alpha chain	LDTEPR**S**PQTQEAA	0.998	1	2	2.3	
PI4KB	Phosphatidylinositol 4-kinase beta	TA**S**NPKVENEDEPVR	0.999	1	2	2.3	*
PI4KB	Phosphatidylinositol 4-kinase beta	**S**VENLPEcGITHEQR	1.000	1	2	2.9	*
PHKB	Phosphorylase b kinase regulatory subunit beta	QS**S**TVDAPELR	0.994	1	2	2.9	

PINX1	PIN2/TERF1-interacting telomerase inhibitor 1	EAAVTDVEN**S**PQHK	0.997	1	2	2.4	*
ATP2B1	Plasma membrane calcium-transporting ATPase 1	IED**S**EPHIPLIDDTDAEDDAPTK	1.000	2	3	6.5	*
PHLDB1	Pleckstrin homology-like domain family B member 1	**S**P**S**PTLGESLAPR	1.000	2	2	3.1	*
PLEC	Plectin	QI**T**VEELVR	1.000	1	2	2.4	
PABPN1	Polyadenylate-binding protein 2	QmNm**S**PPPGNAGPVImSLEEK	1.000	1	3	5.3	
PMF1	Polyamine-modulated factor 1	GPEGS**S**PESVPVDTTVSR	0.995	1	2	2.8	
LMNA	Prelamin-A/C	**S**VGGSGGGSFGDSLVTR	1.000	1	2	3.7	*
FIP1L1	Pre-mRNA 3'-end-processing factor FIP1	AEFT**S**PPSLFK	0.990	1	2	3.0	
FIP1L1	Pre-mRNA 3'-end-processing factor FIP1	DH**S**PTPSVFNSDEER	1.000	1	2	3.7	
PRPF38A	Pre-mRNA-splicing factor 38A	VSALEEDmDDVE**SS**EEEEEEDEKLER	1.000	2	3	4.8	*
TRIP12	Probable E3 ubiquitin-protein ligase TRIP12	HLAESESLLT**S**PPK	1.000	1	2	3.1	
TRIP12	Probable E3 ubiquitin-protein ligase TRIP12	SE**S**PPAELPSLR	1.000	1	2	2.5	
TRIP12	Probable E3 ubiquitin-protein ligase TRIP12	DDSLDL**S**PQGR	1.000	1	2	2.8	*
ZDHHC5	Probable palmitoyltransferase ZDHHC5	SIGSASPGPGQPPLS**S**PTR	0.996	1	2	2.5	
ZDHHC5	Probable palmitoyltransferase ZDHHC5	GD**S**LKEPTSIADSSR	1.000	1	2	3.2	*
AKT1S1	Proline-rich AKT1 substrate 1	LN**T**SDFQK	0.997	1	2	2.4	
PSMA5	Proteasome subunit alpha type-5	IT**S**PLmEPSSIEK	1.000	1	2	2.8	
AATF	Protein AATF	TESEEI**SS**EDDEPVAEK	0.999	2	2	3.5	*
CASC3	Protein CASC3	GTVTGERQ**S**GDGQESTEPVENK	1.000	1	3	4.8	*
CBY1	Protein chibby homolog 1	SA**S**LSNLHSLDR	0.998	1	2	2.3	*
DEK	Protein DEK	DE**S**EEEEDDDEDEDEEEEKEK	1.000	1	2	3.5	*
FAM172A	Protein FAM172A	KQL**S**ADGTDEPAEK	1.000	1	2	2.9	*
STRIP1	Protein FAM40A	AA**S**PPASASDLIEQQQK	1.000	1	2	4.6	
PRKCD	Protein kinase C delta type	LLAEALNQV**S**QR	1.000	1	2	2.5	*
ZMYND8	Protein kinase C-binding protein 1	LNFDmTA**S**PK	0.998	1	2	2.3	
ZMYND8	Protein kinase C-binding protein 1	ELSESVQQQSAPVPLI**S**PK	1.000	1	2	3.7	
ERBB2IP	Protein LAP2	LLQNGDILNN**S**PEEK	1.000	1	2	3.7	
LSM12	Protein LSM12 homolog	TE**T**PPPLASLNVSK	1.000	1	2	3.0	
FAM129A	Protein Niban	RV**S**AILPGAPDNEVFQEPEEK	1.000	1	3	4.5	*
PATL1	Protein PAT1 homolog 1	ST**S**PVIGSPPVR	0.998	1	2	3.0	
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	KTG**S**YGALAEITASK	0.994	1	2	3.4	*
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	RS**T**QGVTLTDLQEAEK	0.999	1	2	4.1	*
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	DKK**S**PLIESTANmENNQPQK	1.000	1	3	4.6	*
PPM1G	Protein phosphatase 1G	KLEEAL**S**VEGAEENGNSDK	1.000	1	3	5.1	*
PPP1R2	Protein phosphatase inhibitor 2	EHE**SS**GEEDNDLSPEER	1.000	2	3	4.6	
PRUNE2	Protein prune homolog 2	DTGGPAEGVEALAm**S**PQQPQR	1.000	1	3	3.8	
RER1	Protein RER1 -	VDPSLmED**S**DDGPSLPTK	1.000	1	2	4.3	
SCRIB	Protein scribble homolog	mQ**S**PELPAPER	1.000	1	2	2.9	

SON	Protein SON	ESEQTAAVGL**S**PK	1.000	1	2	3.0	
PCDH7	Protocadherin-7	SVNGGPG**S**PDLAR	1.000	1	2	2.6	
GULP1	PTB domain-containing engulfment adapter protein 1	ITQVSS**S**PAGSVTAK	0.996	1	2	3.6	
PUM1	Pumilio homolog 1	RD**S**LTGSSDLYK	1.000	1	2	2.9	*
PUM2	Pumilio homolog 2	GKA**S**PFEEDQNR	1.000	1	2	2.3	*
N/A	Putative GTP-binding protein Parf	NISL**SS**EEEDEGLAGHPR	1.000	2	2	4.2	*
NOP2	Putative ribosomal RNA methyltransferase NOP2	GVDSETPVVPSPSEI**S**PGLK	1.000	1	2	4.0	*
N/A	Putative rRNA methyltransferase 3	ALDISL**SS**EEERDEDESIAETK	1.000	2	3	4.5	*
N/A	Putative rRNA methyltransferase 3	QED**S**EEEEEEQLNQTLAEmK	1.000	1	3	4.4	
PDXDC1	Pyridoxal-dependent decarboxylase domain-containing protein 1	VQGTGV**T**PPPTPSGTR	1.000	1	2	3.3	
RAB3GAP1	Rab3 GTPase-activating protein catalytic subunit	AG**S**QLGLDHLR	1.000	1	2	2.3	*
RANBP3L	Ran-binding protein 3	VL**S**PPKLNEASSDASR	1.000	1	2	2.8	*
RAPGEF1	Rap guanine nucleotide exchange factor 1	**S**DEQLSSLDR	1.000	1	2	3.1	*
RIN2	Ras and Rab interactor 2	QA**S**FLEAEGSAK	1.000	1	2	2.4	
G3BP1	Ras GTPase-activating protein-binding protein 1	SA**S**PAPADVAPAQEDLR	0.993	1	2	4.7	*
RAPH1	Ras-associated and pleckstrin homology domains-containing protein 1	TA**S**AGTVSDAEVR	1.000	1	2	3.8	*
REEP4	Receptor expression-enhancing protein 4	SF**S**mQDLR	1.000	1	2	2.4	
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	DVEDmEL**S**DVEDDGSK	1.000	1	2	4.6	*
RPTOR	Regulatory-associated protein of mTOR	ILDTSSLTQ**S**APA**S**PTNK	0.996	2	2	4.4	*
RSF1	Remodeling and spacing factor 1	IE**S**DEEEDFENVGK	1.000	1	2	4.9	*
RCOR1	REST corepressor 1	EREE**S**EDELEETNGSNPIDIEIDPNK	1.000	1	3	6.2	
RBL1	Retinoblastoma-like protein 1	EAVT**T**PVASATQSVSR	0.998	1	2	2.8	
RBL1	Retinoblastoma-like protein 1	VIAISGDAE**S**PAKR	1.000	1	2	3.6	*
ARHGEF5	Rho guanine nucleotide exchange factor 5	LDSLAEAPGLS**S**PR	1.000	1	2	3.8	
ARHGEF6	Rho guanine nucleotide exchange factor 6	KA**S**EEEYVIR	1.000	1	2	2.9	*
ARHGEF6	Rho guanine nucleotide exchange factor 6	KD**S**VPQLLLPEEEK	1.000	1	2	4.1	*
ARHGEF7	Rho guanine nucleotide exchange factor 7	m**S**GFIYQGK	1.000	1	2	3.1	*
RHBDF2	Rhomboid family member 2	SV**S**LQEPR	1.000	1	2	2.5	*
RAVER1	Ribonucleoprotein PTB-binding 1	HKm**S**PPPSSFNEPR	1.000	1	2	3.2	*
RRM2	Ribonucleoside-diphosphate reductase subunit M2	VPLATITDQQQLQV**S**PLK	1.000	1	2	5.7	*
RPS6KA3	Ribosomal protein S6 kinase alpha-3	NQ**S**PVLEPVGR	1.000	1	2	3.1	
RRP1B	Ribosomal RNA processing protein 1 homolog B	SILV**S**PTGLSR	0.999	1	2	2.6	
RPAP3	RNA polymerase II-associated protein 3	HNVIKPVDNPPHRG**S**PK	1.000	1	3	3.8	*
RBM14	RNA-binding protein 14	LSE**S**QLSFR	1.000	1	2	3.7	
RBM25	RNA-binding protein 25	LGASN**S**PGQPNSVK	1.000	1	2	2.8	*
RBM33	RNA-binding protein 33	DIKEE**S**DEEDDDDEESGR	1.000	1	3	4.0	*

RALY	RNA-binding protein Raly	GRL**S**PVPVPR	1.000	1	2	2.2	*
RRP12	RRP12-like protein	GDSIEEILAD**S**EDEDEEEER	1.000	1	2	4.5	*
SLTM	SAFB-like transcription modulator	**S**PGHmVILNQTK	0.991	1	2	2.8	
SLTM	SAFB-like transcription modulator	DGQDAIAQ**S**PEKETK	1.000	1	2	2.6	*
SASH1	SAM and SH3 domain-containing protein 1	SH**S**LDDLQGEADAGK	0.992	1	2	4.9	*
SCYL2	SCY1-like protein 2	RA**S**LTLEEK	0.998	1	2	2.6	*
SCFD1	Sec1 family domain-containing protein 1	VNLEESAGVEN**S**PAGARPK	1.000	1	2	3.8	*
SEC23IP	SEC23-interacting protein	KL**S**LGAYVSSAR	1.000	1	2	2.5	*
SENP3	Sentrin-specific protease 3	**S**PPVPSGPPmEEDGLR	1.000	1	2	2.2	
SEPT2	Septin-2	IYHLPDAE**S**DEDEDFKEQTR	1.000	1	3	3.9	*
SEPT8	Septin-7	ILEQQNSSR**T**LEK	1.000	1	2	2.7	*
SEPT9	Septin-9	ATVASS**S**QKFQDLGVK	0.999	1	2	4.4	*
SEPT9	Septin-9	**S**FEVEEIEPPNSTPPR	1.000	1	2	4.6	
SQSTM1	Sequestosome-1	LTPT**S**PESSSmDTEDK	0.998	1	2	2.7	
SERINC1	Serine incorporator 1	SDG**S**LEDGDDVHR	1.000	1	2	2.9	*
SRRM1	Serine/arginine repetitive matrix protein 1	KVEL**S**E**S**EEDKGSK	1.000	2	2	2.4	
SRRM1	Serine/arginine repetitive matrix protein 1	**S**PELPEPSVR	1.000	1	2	3.1	
SRRM1	Serine/arginine repetitive matrix protein 1	APKPEPVPEPKEP**S**PEK	1.000	1	3	3.9	*
SRRM1	Serine/arginine repetitive matrix protein 1	KE**T**E**S**EAEDNLDDLER	1.000	2	2	6.6	*
SRRM1	Serine/arginine repetitive matrix protein 1	RL**S**P**S**A**S**PPR	1.000	3	2	2.9	*
SRRM2	Serine/arginine repetitive matrix protein 2	SL**S**Y**S**PVER	1.000	2	2	2.6	*
SRSF11	Serine/arginine-rich splicing factor 11	DYDEEEQGYD**S**EKEK	1.000	1	2	2.4	*
SRSF11	Serine/arginine-rich splicing factor 11	LNHVAAGLV**S**PSLK	1.000	1	2	3.5	*
SRSF6	Serine/arginine-rich splicing factor 6	SH**S**PLPAPPSK	1.000	1	2	3.0	
STK10	Serine/threonine-protein kinase 10	ANQ**S**RPN**S**VALETLGGEK	1.000	2	3	5.1	*
STK3	Serine/threonine-protein kinase 3	ELEEEEEN**S**DEDELDSHTmVK	1.000	1	3	3.8	
PRKD1	Serine/threonine-protein kinase D1	SP**S**ESFIGR	0.992	1	2	2.6	
MARK2	Serine/threonine-protein kinase MARK2	SRN**S**PLLDR	1.000	1	2	2.4	*
MARK2	Serine/threonine-protein kinase MARK2	VPA**S**PLPGVER	1.000	1	2	3.0	*
PAK2	Serine/threonine-protein kinase PAK 2	YL**S**FTPPEK	1.000	1	2	2.6	*
PAK2	Serine/threonine-protein kinase PAK 2	**S**VIDPIPAPAGDSNVDGGAK	1.000	1	2	2.3	
PRPF4B	Serine/threonine-protein kinase PRP4 homolog	EIIDA**S**DKEGL**S**PAKR	1.000	2	2	2.2	
SIK3	Serine/threonine-protein kinase SIK3	RA**S**DGGANIQLHAQQLLK	1.000	1	3	4.0	*
SRPK1	Serine/threonine-protein kinase SRPK1	RPNKQEE**S**E**S**PVETPLTENPPNK	1.000	2	3	4.4	
SRPK1	Serine/threonine-protein kinase SRPK1	AEIP**S**GDEQEQEHNGPLDNK	1.000	1	2	2.5	*
TAOK3	Serine/threonine-protein kinase TAO3	NGPLNE**S**QEEEEDNEHGSNLNR	1.000	1	3	5.0	*
PPP2R5C	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform	RK**S**ELPQDPHTEK	1.000	1	3	3.8	*
PPP4R2	Serine/threonine-protein phosphatase 4 regulatory	ESDDALAVNEEPSEEGTHmEDSDG**S**PAQR	0.994	1	3	5.3	

	subunit 2						
PPP4R2	Serine/threonine-protein phosphatase 4 regulatory subunit 2	AHSDSPASEPEVSSL**S**PVK	1.000	1	2	6.2	*
SH3BP1	SH3 domain-binding protein 1	TESDLPKPA**S**PK	1.000	1	2	2.6	*
SH3KBP1	SH3 domain-containing kinase-binding protein 1	**S**IEVENDFLPVEK	1.000	1	2	4.7	*
SPPL2B	Signal peptide peptidase-like 2B	RD**S**DAPISQHPPGEEPAK	1.000	1	3	3.9	*
SIPA1L1	Signal-induced proliferation-associated 1-like protein 1	LIDLE**S**PTPESQK	0.999	1	2	2.9	*
SSBP3	Single-stranded DNA-binding protein 3	N**S**PNNISGISNPPGTPR	0.999	1	2	3.7	
PDS5A	Sister chromatid cohesion protein PDS5 homolog A	AAGSQE**S**PGGLEASNAK	1.000	1	2	3.6	*
SNW1	SNW domain-containing protein 1	GPP**S**PPAPVmHSPSR	0.990	2	2	3.0	*
SCNM1	Sodium channel modifier 1	ESSDLLASAPI**S**PTK	0.995	1	2	3.1	
UTP3	Something about silencing protein 10	KKEEN**S**AEEEALEEQNAK	1.000	1	3	4.0	*
SPTBN1	Spectrin beta chain, brain 1	GDQVSQNGLPAEQG**S**PR	1.000	1	2	5.7	*
Ssfa2	Sperm-specific antigen 2 homolog	SQ**S**LPTTLLSPVR	1.000	1	2	3.3	*
Ssfa2	Sperm-specific antigen 2 homolog	TPLGA**S**LDEQSSGALK	1.000	1	2	3.8	*
SF1	Splicing factor 1	**S**P**S**PEPIYNSEGK	1.000	2	2	3.1	*
RBM17	Splicing factor 45	RPDPD**S**DEDEDYER	1.000	1	2	3.8	*
SFSWAP	Splicing factor, suppressor of white-apricot homolog	GV**S**QEKDGQISSAIVSSVQSK	1.000	1	3	3.9	*
SFSWAP	Splicing factor, suppressor of white-apricot homolog	VKLDDD**S**EEDEESR	1.000	1	2	5.7	*
SART3	Squamous cell carcinoma antigen recognized by T-cells 3	cVTIDVA**S**PSK	1.000	1	2	2.6	
Q7KZF4	Staphylococcal nuclease domain-containing protein 1	AA**S**PATETVPAFSER	1.000	1	2	3.7	
STIM1	Stromal interaction molecule 1	AEQ**S**LHDLQER	1.000	1	2	2.7	*
PPAN	Suppressor of SWI4 1 homolog	TDGD**S**DAEDPGAPLEAVGAGR	0.998	1	2	3.9	
SURF2	Surfeit locus protein 2	DmDKSENDTPQDFL**T**DQEEEKPK	1.000	1	3	5.4	*
SMARCC1	SWI/SNF complex subunit SMARCC1	KH**S**P**S**PPPPTPTESR	1.000	2	3	4.4	*
SMARCC1	SWI/SNF complex subunit SMARCC1	**S**PQVPAAQQmLNFPEK	1.000	1	2	2.4	
SMARCC2	SWI/SNF complex subunit SMARCC2	DmDEP**S**PVPNVEEVTLPK	1.000	1	2	5.1	*
SNAP23	Synaptosomal-associated protein 23	ATWGDGGDN**S**PSNVVcK	1.000	1	2	4.3	
STX4	Syntaxin-4	AIEPQKEEADENYN**S**VNTR	1.000	1	3	4.8	*
TLN1	Talin-1	SKDHFGLEGDEESTmLEDSV**S**PK	0.999	1	3	5.3	*
TPX2	Targeting protein for Xklp2	SSELPLTVPV**S**PK	1.000	1	2	2.6	
TMF1	TATA element modulatory factor	SVSEIN**S**DDELPGK	1.000	1	2	2.5	
TBC1D1	TBC1 domain family member 1	SF**S**QPGLR	1.000	1	2	2.5	
TBC1D25	TBC1 domain family member 25	QA**S**LDGLQQLR	1.000	1	2	2.2	

TBC1D2B	TBC1 domain family member 2B	DTSPDKGELV**S**DEEEDT	1.000	1	2	2.7	*
TBC1D5	TBC1 domain family member 5	TISSSP**S**IE**S**LPGGR	1.000	2	2	2.8	
RIF1	Telomere-associated protein RIF1	SSD**S**VDIGEQEEK	1.000	1	2	4.1	*
TNS1	Tensin-1	HLGGSGSVVPG**S**PSLDR	0.998	1	2	3.7	*
TNS3	Tensin-3	RE**S**LPSAER	1.000	1	2	2.2	*
TTC7A	Tetratricopeptide repeat protein 7A	DG**S**FEGLTVK	1.000	1	2	2.7	*
TMX1	Thioredoxin-related transmembrane protein 1	VEEEQEADEEDV**S**EEDTENK	1.000	1	3	6.0	*
THOC1	THO complex subunit 1	TGEDEDEEDNDALLKENE**S**PDVR	1.000	1	3	4.4	*
THOC5	THO complex subunit 5 homolog	ALFKPPEDSQDDE**S**D**S**DAEEEQTTK	0.997	2	3	4.2	*
THUMPD1	THUMP domain-containing protein 1	FIDKDQQH**S**G**S**EGEDDDVEAALK	1.000	2	3	4.8	*
THRAP3	Thyroid hormone receptor-associated protein 3	FSGEEGEIEDDE**S**GTENREEK	0.999	1	3	4.5	*
THRAP3	Thyroid hormone receptor-associated protein 3	SPVGK**S**PPATGSAYGSSQK	0.999	1	3	4.1	
THRAP3	Thyroid hormone receptor-associated protein 3	ASVSDL**S**PR	0.999	1	2	2.5	
THRAP3	Thyroid hormone receptor-associated protein 3	GSF**S**DADVK	1.000	1	2	3.0	
THRAP3	Thyroid hormone receptor-associated protein 3	IDI**S**PSTFR	1.000	1	2	2.9	
TRIP11	Thyroid receptor-interacting protein 11	LSVHDLKPLD**S**PGR	1.000	1	3	3.8	*
TJP2	Tight junction protein ZO-2	DG**S**PPPAFKPEPPK	1.000	1	2	2.2	
TOR1AIP1	Torsin-1A-interacting protein 1	LEQTSQQPQPQL**S**PATSR	1.000	1	2	4.7	*
TRAPPC10	Trafficking protein particle complex subunit 10	RQE**S**GSSLETPSGLALEDGAHVLR	1.000	1	3	5.3	*
TRAIP	TRAF-interacting protein	AR**S**PVQDVLK	1.000	1	2	2.9	
TCEA1	Transcription elongation factor A protein 1	KKEPTISSQN**S**PEAR	1.000	1	3	4.4	*
SUPT6H	Transcription elongation factor SPT6	Km**S**DDEDDDEEEYGKEEHEK	1.000	1	3	5.3	*
TFAP4	Transcription factor AP-4	FIQELSGS**S**PK	0.998	1	2	2.4	
TFDP1	Transcription factor Dp-1	VFIDQNL**S**PGK	1.000	1	2	2.5	
TRIM28	Transcription intermediary factor 1-beta	**S**GEGEVSGLmR	1.000	1	2	4.0	*
ATRX	Transcriptional regulator ATRX	EVIEIEDA**S**PTK	0.995	1	2	2.6	
ATRX	Transcriptional regulator ATRX	LTV**S**DGE**S**GEEEKK	1.000	2	2	3.5	*
GATAD2A	Transcriptional repressor p66 alpha	DTSTEALLKS**S**PEER	0.999	1	2	3.6	*
TFRC	Transferrin receptor protein 1	LAVDEEEN**T**DNNmK	1.000	1	2	3.0	
TAGLN2	Transgelin-2	NF**S**DNQLQEGK	1.000	1	2	3.7	*
EIF2B5	Translation initiation factor eIF-2B subunit epsilon	AV**S**PQLDDIK	1.000	1	2	3.2	*
PUS1	tRNA pseudouridine synthase A, mitochondrial	VK**S**LEDEEAPR	1.000	1	2	3.2	*
TFIP11	Tuftelin-interacting protein 11	GAAEEAD**S**DD**S**DDDEKPAKQEDFPK	1.000	2	3	6.0	*
TPD52L2	Tumor protein D54	NSATFK**S**FEDR	1.000	1	2	3.0	*
BAZ1B	Tyrosine-protein kinase BAZ1B	LADDEGD**S**DSESVGQSR	0.991	1	2	4.8	*
BAZ1B	Tyrosine-protein kinase BAZ1B	RQ**S**LELQK	1.000	1	2	2.6	*
PTPN12	Tyrosine-protein phosphatase non-receptor type 12	DVDVSEE**S**PPPLPER	1.000	1	2	2.6	
MPHOSPH1	U3 small nucleolar ribonucleoprotein protein	VTFALPEDEAEDT**S**PLAVK	0.999	1	2	5.9	

0	MPP10						
MPHOSPH10	U3 small nucleolar ribonucleoprotein protein MPP10	LETDAEEEQL**S**DVAADAPK	1.000	1	3	4.8	*
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	KS**S**DDE**S**EEDEDDLLQR	0.994	2	2	4.1	*
PRPF3	U4/U6 small nuclear ribonucleoprotein Prp3	WDEQTSNTKGDDDEE**S**DEEAVKK	1.000	1	3	5.5	*
USP14	Ubiquitin carboxyl-terminal hydrolase 14	A**S**GEmASAQYITAALR	1.000	1	2	4.2	*
USP15	Ubiquitin carboxyl-terminal hydrolase 15	**S**PGASNFSALPK	1.000	1	2	3.0	*
USP24	Ubiquitin carboxyl-terminal hydrolase 24	VSDQN**S**PVLPK	1.000	1	2	2.6	*
USP36	Ubiquitin carboxyl-terminal hydrolase 36	KPAPPQSLTTPPTTSQG**S**PGTSESR	1.000	1	3	5.4	*
USP36	Ubiquitin carboxyl-terminal hydrolase 36	GASSGL**S**PEHPASR	1.000	1	2	2.2	*
UFD1L	Ubiquitin fusion degradation protein 1 homolog	FVAFSGEGQ**S**LR	1.000	1	2	2.9	
UFD1L	Ubiquitin fusion degradation protein 1 homolog	GVEPSP**S**PIKPGDIK	1.000	1	2	2.7	*
UBAP2L	Ubiquitin-associated protein 2-like	RYPSSISS**S**PQK	0.997	1	2	2.5	
C12orf45	Uncharacterized protein C12orf45 homolog	GKIEVLD**S**PASK	1.000	1	2	2.7	*
FAM208A	Uncharacterized protein C3orf63	GAQ**S**PLLEVDAASVK	1.000	1	2	4.6	*
N/A	Uncharacterized protein C6orf203 homolog	DADEED**S**DEETHLPER	1.000	1	2	2.8	*
C9orf78	Uncharacterized protein C9orf78 homolog	RAD**S**E**S**EEDEQESEEVR	1.000	2	3	3.9	*
CXorf23	Uncharacterized protein CXorf23 homolog	VQEESYPQ**S**PR	1.000	1	2	3.6	
N/A	Uncharacterized protein KIAA1143 homolog	IQPQLPDDDGDH**S**DKEDEQPQVVVLK	1.000	1	3	4.7	
KIAA1522	Uncharacterized protein KIAA1522	GLAGPPA**S**PGK	1.000	1	2	2.6	
KIAA1522	Uncharacterized protein KIAA1522	LQLERPV**S**PEAQADLQR	1.000	1	3	3.9	
PBDC1	UPF0368 protein Cxorf26 homolog	GADNEEEE**S**EKGAD**S**GGEKEEGVNR	1.000	2	3	4.4	*
MCMBP	UPF0557 protein C10orf119 homolog	VH**S**PPASLVPR	1.000	1	2	2.5	
C1orf52	UPF0690 protein C1orf52 homolog	LLPEGEETVE**S**DDDKDER	1.000	1	2	4.5	*
VPS4B	Vacuolar protein sorting-associated protein 4B	EEQSSAVDEKGND**S**DGEAESDDPEK	1.000	1	3	5.0	
VAPB	Vesicle-associated membrane protein-associated protein B	**S**LTSSLDDAEVKK	0.999	1	2	2.5	*
HDLBP	Vigilin	VATLN**S**EEESDPPTYK	1.000	1	2	3.3	*
VWA5A	von Willebrand factor A domain-containing protein 5A	AYV**S**LDSmEDEESESK	1.000	2	2	3.3	*
ATP6V0A2	V-type proton ATPase 116 kDa subunit a isoform 2	KD**S**EEEVSLLGSQDIEEGSNR	1.000	1	3	4.8	
WDHD1	WD repeat and HMG-box DNA-binding protein 1	SHILGDDEN**S**VDAPmLK	1.000	1	2	4.0	*
YLPM1	YLP motif-containing protein 1	SGGPLPE**S**PR	1.000	1	2	2.2	
YTHDC1	YTH domain-containing protein 1	GI**S**PIVFDR	1.000	1	2	3.1	
ZC3H11A	Zinc finger CCCH domain-containing protein 11A	KVEAPETNIDK**T**PK	1.000	1	3	3.9	
ZC3H13	Zinc finger CCCH domain-containing protein 13	SKGD**S**DV**S**DEEVAPQSK	0.999	2	2	3.7	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	SL**S**PSHLSEDR	1.000	1	2	2.4	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	GNLETSEDAQVF**S**PK	1.000	1	2	3.0	
ZC3H18	Zinc finger CCCH domain-containing protein 18	ETGSEQDLDGAGERA**S**DLEDEENATR	1.000	1	3	4.4	*

ZC3H18	Zinc finger CCCH domain-containing protein 18	SPEDEEQPAL**S**DDDILR	1.000	1	2	3.2	*
ZNF106	Zinc finger protein 106	SL**S**ESSVIVDR	1.000	1	2	3.3	*
ZNF106	Zinc finger protein 106	ATGDG**SS**PELPSLER	1.000	2	2	3.4	*
ZNF148	Zinc finger protein 148	GGLLTSEEDSGFST**S**PK	0.991	1	2	4.2	
ZNF592	Zinc finger protein 592	EAIQTPSEENE**S**PLK	1.000	1	2	2.9	
ZNF609	Zinc finger protein 609	AP**S**LTDLVK	0.999	1	2	2.3	
ZNF438	Zinc finger protein 828	KS**S**PASLDFSESQK	1.000	1	2	3.6	*
DPF2	Zinc finger protein ubi-d4	VDDD**S**LGEFPVTNSR	1.000	1	2	4.0	*
ZYX	Zyxin	**S**PGGPGPLTLK	1.000	1	2	2.4	*

Table 4.3.21: List of phosphopeptides identified following LC/MS analysis of Titanium Dioxide phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO NCBI database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
TNKS1BP1	182 kDa tankyrase-1-binding protein	**S**PPSGSQSLLEGImTASSSK	0.999	1	2	4.9	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	NSGSF**S**PGLETEDPLEAR	1.000	1	2	4.4	*
TNKS1BP1	182 kDa tankyrase-1-binding protein	EEGVSQQGSGAPLAPE**S**PGGPISGVR	1.000	1	3	4.5	
N/A	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3-like isoform 5	RN**S**VTPLASPEPTK	0.998	1	2	2.6	*
PFKL	6-phosphofructokinase, liver type	TL**S**IDKGF	1.000	1	2	2.4	*
AKAP1	A kinase anchor protein 1, mitochondrial	SE**S**SGNLPSNVDTR	0.999	1	2	4.2	*
ACACA	acetyl-CoA carboxylase 1	SSm**S**GLHLVK	1.000	1	2	2.7	*
AFAP1	actin filament-associated protein 1 isoform 1	SGTSSPQ**S**PVFR	0.998	1	2	2.9	
AKAP12	A-kinase anchor protein 12-like	AA**S**PEcEEAHPQPVQTVDASISER	1.000	1	3	4.3	
AKAP13	A-kinase anchor protein 13	FLSH**S**TDSLNK	0.996	1	2	2.5	*
AKAP8L	A-kinase anchor protein 8-like	AD**S**DGDL**S**ENDDGAGDLR	1.000	2	2	4.6	*
AKAP9	A-kinase anchor protein 9	EG**S**LQDLDISETSVK	1.000	1	2	3.1	
PARVA	alpha-parvin-like	KKDD**S**FLGK	1.000	1	2	2.4	
TXLNA	alpha-taxilin	EQGLE**S**PGAQPSSSPR	1.000	1	2	3.4	
MKI67	Antigen KI-67	ERPQ**S**PGKLESPGVTPPTANDER	0.999	1	3	4.0	
MKI67	Antigen KI-67	RE**S**VNLDESEGAK	1.000	1	2	3.1	*
TP53BP2	apoptosis-stimulating of p53 protein 2	KNQ**S**SEDILR	0.993	1	2	2.7	*
DDX24	ATP-dependent RNA helicase DDX24	AQAV**S**EEEEEGEEEGESSSPQK	1.000	1	2	4.5	*
ARID1A	AT-rich interactive domain-containing protein 1A	GP**S**PSPVGSPASVAQSR	0.998	1	2	2.9	
ARID4A	AT-rich interactive domain-containing protein 4A	ILGQP**S**PEKK	1.000	1	2	2.2	
BIRC6	baculoviral IAP repeat-containing protein 6	LEGDSDDLLED**S**DSEEHSR	1.000	1	3	4.4	*
BCLAF1	bcl-2-associated transcription factor 1	FND**S**QGDDTEETEDYR	1.000	1	2	5.2	*
BOD1L1	Biorientation of chromosomes in cell division protein 1-like	TETDISTVEQS**S**PSSK	0.990	1	2	4.6	
ARFGEF1	brefeldin A-inhibited guanine nucleotide-exchange protein 2-like	ELEKPIQSKPQSPVIQATAG**S**PK	0.998	2	3	4.5	*
BAHD1	Bromo adjacent-likey domain-containing 1 protein	DL**S**PEPTPDEGAR	1.000	1	2	2.5	
BAZ1A	bromodomain adjacent to zinc finger domain protein 1A	RL**S**LGQEDNIASK	1.000	1	2	2.9	*
BRD1	Bromodomain-containing protein 1	VHGEPA**S**DL**S**DID	1.000	2	2	3.3	*
BRD3	bromodomain-containing protein 3 isoform 1	SE**S**PPPLSEPK	1.000	1	2	2.8	
BRD4	Bromodomain-containing protein 4	IH**S**PIIR	1.000	1	2	2.3	

CAMSAP2	calmodulin-regulated spectrin-associated protein 2 isoform 1	SV**S**NEGLTLNNSR	1.000	1	2	3.5	*
CAST	Calpastatin	SKD**T**SPAPVAEAVPR	0.997	1	2	3.1	
CLIP1	CAP-Gly domain-containing linker protein 1	TASESISNL**S**EAG**S**VK	0.997	2	2	3.9	*
CLIP1	CAP-Gly domain-containing linker protein 1	AA**S**PLSTAGATTASSSSATPSNIPHKPSQSTAK	1.000	1	3	3.9	*
CTNND1	Catenin delta-1	AP**S**RQDVYGPQPQVR	1.000	1	3	3.8	*
CD2BP2	CD2 antigen cytoplasmic tail-binding protein 2-like	HSLD**S**DEEDDDDEGSSK	1.000	1	2	4.7	*
CDC42EP4	cdc42 effector protein 4-like	NAm**S**LPQLNEK	1.000	1	2	3.1	
CDK4	Cell division protein kinase 4	ALQHSYLHKEE**S**DPE	1.000	1	2	2.8	*
CENPC	centromere protein C 1	LVLPSN**S**PNVR	0.996	1	2	2.2	
CENPC	centromere protein C 1	IVIGIV**S**PAPV**S**PK	1.000	2	2	4.0	*
CENPQ	centromere protein Q-like	DLDVLHNS**S**PVK	1.000	1	2	3.9	
CEP170	Centrosomal protein of 170 kDa	SIK**S**DVPVYLK	1.000	1	2	3.1	
PCYT1A	Choline-phosphate cytidylyltransferase A	AVTcDI**S**EDEED	1.000	1	2	2.2	
PCYT1A	Choline-phosphate cytidylyltransferase A	mLQAI**S**PR	1.000	1	2	2.6	
CLASP1	CLIP-associating protein 1	SR**S**DIDVNAAASAK	1.000	1	2	3.2	*
CLASP2	CLIP-associating protein 2	SR**S**DIDVNAAAGAK	0.997	1	2	4.1	*
CLUAP1	Clusterin-associated protein 1	KPEPLDE**S**DNDF	1.000	1	2	3.5	*
DENND4A	C-myc promoter-binding protein	mN**S**SFSVKPSEK	0.990	1	2	2.9	*
DENND4A	C-myc promoter-binding protein	TP**S**IDLQR	1.000	1	2	3.0	
COPB1	Coatomer subunit beta'	TTVHQEPDGKPAS**S**PVILASQPIQK	0.997	1	3	4.6	
CC2D1A	coiled-coil and C2 domain-containing protein 1A-like isoform 1	LANHDEG**S**EEEEDEAPK	1.000	1	2	3.8	*
CCDC12	coiled-coil domain-containing protein 12-like	LKGQEDNLASAVDATTGQEAcD**S**D	1.000	1	2	6.2	*
CCDC25	Coiled-coil domain-containing protein 25	VENmSSNQDGND**S**DEFm	1.000	1	2	3.9	
CCDC6	Coiled-coil domain-containing protein 6	LDQPV**S**APP**S**PR	1.000	2	2	2.5	*
CCDC94	coiled-coil domain-containing protein 94-like isoform 2	LLED**S**D**S**EDEAPPSRPR	1.000	2	2	3.1	*
COBLL1	Cordon-bleu protein-like 1	ST**S**VDDNDKSSTDGVmVR	0.994	1	3	4.2	*
CRTC2	CREB-regulated transcription coactivator 2	HG**S**GPNIILTGDSSPGFSK	1.000	1	3	4.0	*
CRTC3	CREB-regulated transcription coactivator 3-like, partial	**S**NPSIQATLNK	1.000	1	2	2.6	*
CDK17	cyclin-dependent kinase 17	RA**S**LSEIGFGK	1.000	1	2	3.6	*
CSRP1	cysteine and glycine-rich protein 1-like	GFGFGQGAGALVH**S**E	1.000	1	2	3.7	*
SLC7A11	Cystine/glutamate transporter	GGYLQGNV**S**GR	1.000	1	2	3.0	*
SLC7A11	Cystine/glutamate transporter	LP**S**mGDQEAPGQEK	1.000	1	2	3.6	*
DENND4C	DENN domain-containing protein 4C	VP**S**GLFDTNNR	1.000	1	2	3.1	*
DIS3L2	DIS3-like exonuclease 2 isoform 1	SLGLEKE**S**DEEPED	1.000	1	2	2.5	*
ADAM17	Disintegrin and metalloproteinase domain-containing protein 17	**S**FEDLTDHPVTR	1.000	1	2	2.4	*

DLG1	Disks large-like 1	EQLmSSSISSGSG**S**LR	0.994	1	2	4.2	*
ERCC6	DNA excision repair protein ERCC-6	AESALNLSLDSSNK**S**DEEPEVISVK	0.998	1	3	5.2	*
ERCC6	DNA excision repair protein ERCC-6	IL**S**DDEGEEDAFK	1.000	1	2	4.1	*
POLA2	DNA polymerase alpha subunit B-like	**S**PHQLLSPSSFSPSAAPSQK	0.999	1	3	4.1	
POLD3	DNA polymerase delta subunit 3	VDL**S**DEEAKETENLK	1.000	1	2	2.8	*
CD3EAP	DNA-directed RNA polymerase I subunit RPA34	mQPPDGTIL**T**PTK	0.998	1	2	2.5	
HUWE1	E3 ubiquitin-protein ligase HUWE1	**S**HHAASTTTAPTPAAR	1.000	1	2	3.3	*
EML3	Echinoderm microtubule-associated protein-like 3	AA**S**SANLLLR	0.990	1	2	3.1	*
EML4	Echinoderm microtubule-associated protein-like 4	A**S**P**S**PQPSSQPLQINR	1.000	2	2	2.7	*
ELMOD3	ELMO domain-containing protein 3	TE**S**GERPAGDSDFSLKPGK	1.000	1	3	4.9	*
EEF2K	Elongation factor 2 kinase	KPE**S**DED**S**LGSYGR	1.000	2	2	3.0	*
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	SF**S**KEVEER	1.000	1	2	2.2	*
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	EATLPPV**S**PPK	1.000	2	2	2.4	
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	**S**PGPVQTAIIAPK	1.000	1	2	2.9	*
EIF4B	Eukaryotic translation initiation factor 4B	YAAL**S**VDGEDENEGDDHAE	1.000	1	2	3.5	*
EIF5B	eukaryotic translation initiation factor 5B-like	TSFDDND**S**EELEDKDSK	1.000	1	2	4.5	*
EIF5B	eukaryotic translation initiation factor 5B-like	NKPLPNIE**S**GNEDDDSFK	1.000	1	3	5.2	*
EIF5B	eukaryotic translation initiation factor 5B-like	VEIF**S**G**S**EDDDDSNK	1.000	2	2	3.8	*
FARP1	FERM, RhoGEF and pleckstrin domain-containing protein 1-like	VSALESGPHQ**S**PALSK	0.996	1	2	2.7	*
FARP1	FERM, RhoGEF and pleckstrin domain-containing protein 1-like	LGAPENSGIS**T**LER	1.000	1	2	3.0	
FNDC3B	Fibronectin type III domain-containing protein 3B	LN**S**PPSTIYK	0.999	1	2	2.3	
FIGNL1	fidgetin-like protein 1-like	AE**S**TETAHAIDDR	1.000	1	2	3.2	*
FLNA	Filamin-A	AP**S**VANVGSHcDLSLK	1.000	1	2	2.2	
FLNA	Filamin-A	AFGPGLQGGNAG**S**PAR	1.000	1	2	3.8	*
FLNC	Filamin-C	LG**S**FGSITR	1.000	1	2	2.4	
FKBP15	FK506-binding protein 15	RL**S**LTLDPEK	0.999	1	2	2.2	
FKBP15	FK506-binding protein 15	HNQDSQHSSL**S**GDEDDELFK	1.000	1	3	5.4	*
FOSL2	fos-related antigen 2-like	**S**PPTAGLQPIR	0.994	1	2	2.5	*
FAM160A2	FTS and Hook-interacting protein-like isoform 2	QQ**S**LGGSESPGPAPR	0.995	1	2	2.7	
GEMIN5	gem-associated protein 5	AmADGPNRDDPSQETEQLPSQPQ**S**PR	1.000	1	3	4.2	
USO1	General vesicular transport factor p115	NLGHPVEEEDE**S**GDQEDDDDEmDDGDKDQDI	1.000	1	3	8.5	*
AGPAT9	glycerol-3-phosphate acyltransferase 3	NSA**S**VGIIQR	1.000	1	2	2.6	*
GOLGA3	Golgin subfamily A member 3	DVLQSAAAQHQDQNQEVNGEVQ**S**R	1.000	1	3	5.4	*
HSP90AB1	heat shock protein HSP 90-beta-like	IEDVG**S**DEEDDSGK	1.000	1	2	3.7	*
HSP90AB1	heat shock protein HSP 90-beta-like	EKEI**S**DDEAEEEK	1.000	1	2	3.1	*
HDGFRP2	Hepatoma-derived growth factor-related protein 2	GG**SS**GEELEDNEPVK	1.000	2	2	4.5	*
HNRNPL	heterogeneous nuclear ribonucleoprotein L	TEEGEIVY**S**AEESESR	0.992	1	2	4.2	*

HMGN5	high mobility group nucleosome-binding domain-containing protein 5-like	QDGEKEE**S**LSGV	0.994	1	2	2.3	
HMGA1	high mobility group protein HMG-I/HMG-Y-like	EEEEGISQE**SS**EEEQ	1.000	2	2	3.0	
HIRIP3	HIRA-interacting protein 3-like	HKE**S**ED**S**EEETLAK	1.000	2	2	2.9	*
HIRIP3	HIRA-interacting protein 3-like	LTGGLGD**S**EEEKER	1.000	1	2	3.3	*
HIRIP3	HIRA-interacting protein 3-like	LEE**SS**DEEGEGSVR	1.000	2	2	3.8	*
HIRIP3	HIRA-interacting protein 3-like	VWEEED**T**EEDDDVKK	1.000	1	2	4.7	*
N/A	hypothetical protein I79_008270	GN**S**PAAFPDR	1.000	1	2	2.7	
N/A	hypothetical protein LOC100756984, partial	IQT**S**PE**S**DPEIDR	0.999	2	2	3.9	*
N/A	hypothetical protein LOC100756984, partial	DHLDTPEDEL**S**DEPR	1.000	1	2	3.4	*
N/A	hypothetical protein LOC100773692	VKPL**S**PGAQPK	1.000	1	2	2.3	
INCENP	Inner centromere protein	VEKPATIAGENG**S**PVLR	1.000	1	3	4.5	
IRS1	insulin receptor substrate 1-like	HS**S**ETFSAPTR	0.998	1	2	2.9	*
IRS2	insulin receptor substrate 2, partial	TY**S**LTTPAR	0.993	1	2	2.3	
IRF2BP2	Interferon regulatory factor 2-binding protein 2	**S**PADSLSGASGASELGADGAGK	1.000	1	2	5.7	*
IRF2BPL	interferon regulatory factor 2-binding protein 2-like, partial	LEEPPELNRQ**S**PNPR	1.000	1	2	2.3	
IRF2BPL	interferon regulatory factor 2-binding protein-like	KA**S**PEPPDSAESALK	1.000	1	2	3.5	*
IFIH1	interferon-induced helicase C domain-containing protein 1 isoform 1	LAVLED**S**DE**S**EDDASGHAEELKDNVK	1.000	2	3	4.5	*
IQSEC1	IQ motif and SEC7 domain-containing protein 1	mQF**S**FEGPEK	1.000	1	2	2.8	*
KANK1	KN motif and ankyrin repeat domain-containing protein 1-like	SY**S**AGNASQLELLSR	1.000	1	2	4.4	*
LMNA	Lamin-A/C	SGAQASSTPL**S**PTR	1.000	1	2	3.5	*
BAG6	Large proline-rich protein BAT3	LQEDPNY**S**PQR	0.994	1	2	3.0	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	SEQQAEALD**S**PQKK	1.000	1	2	2.7	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	EL**S**QEVAEPEEALIQSPPTSK	1.000	1	2	4.9	*
LRRFIP1	Leucine-rich repeat flightless-interacting protein 1	**S**VNEGAEQSLER	1.000	1	2	3.7	*
LRRC47	Leucine-rich repeat-containing protein 47	RE**S**GEGEDEVADSAR	1.000	1	2	3.5	*
KDM2A	Lysine-specific demethylase 2A	KIEE**S**DEEAVQAK	1.000	1	2	3.3	*
CCM2	Malcavernin	GIITD**S**FGR	1.000	1	2	2.9	
MDC1	Mediator of DNA damage checkpoint protein 1	DPGAPVVTHLQD**S**PAGR	1.000	1	2	2.3	
MDC1	Mediator of DNA damage checkpoint protein 1	ASDDVDQGVDmG**S**PGGQLEGNQASSATVEDSSAQAGK	1.000	1	3	5.0	
MDC1	Mediator of DNA damage checkpoint protein 1	VLLAED**S**EEEVDFPSGR	1.000	1	2	5.0	
MNS1	Meiosis-specific nuclear structural protein 1	**S**LHVQVLNK	1.000	1	2	2.5	*
MTA3	Metastasis-associated protein MTA3	HAELAG**S**PLK	1.000	1	2	3.1	*
MICALL2	MICAL-like protein 2	LP**S**PAPVQR	1.000	1	2	2.4	
MAP1B	Microtubule-associated protein 1B	ASISPmDEPVPDSE**S**PIEK	0.999	1	2	3.7	
MAP1B	Microtubule-associated protein 1B	SLm**SS**PEDLTK	1.000	2	2	3.8	*

MAP4	microtubule-associated protein 4	AADQQFNLPIDEG**S**LENLEQK	1.000	1	3	4.2	*
MAP4	Microtubule-associated protein 4	VG**S**LDNVGHLPAGGAVK	1.000	1	2	2.8	*
MDN1	midasin-like	RQDEKEE**S**EPEDVEQSQEK	1.000	1	3	5.0	*
MAPK4	Mitogen-activated protein kinase kinase kinase kinase 4	SH**S**FSDPSPPK	1.000	1	2	2.9	
ZAK	Mitogen-activated protein kinase kinase kinase MLT	SS**S**PTQYGLTK	0.998	1	2	2.2	
ABCC1	multidrug resistance-associated protein 1	GS**S**KLDVNEEVEALIVK	0.996	1	2	5.3	*
MUM1L1	Mutated melanoma-associated antigen 1-like protein 1	STQSQENmPNEEDTTVASESVPQQQDD**S**PPPKK	1.000	1	3	4.1	
MYH9	Myosin-9	KG**T**GDc**S**DEEVDGKADGAEAKPAE	1.000	2	3	5.9	*
MYO18A	Myosin-XVIIIa	LEGD**S**DVDSELEDR	1.000	1	2	4.2	*
NHSL1	NHS-like protein 1	NH**S**P**S**PPVTPTGAAPSLASPK	0.999	2	3	4.1	
NLRX1	NLR family member X1	IKPSS**S**ANAIYSLAAR	0.998	1	2	3.3	
SETD6	N-lysine methyltransferase SETD6-like	APL**S**PPAPGR	1.000	1	2	2.6	
NUP153	Nuclear pore complex protein Nup153	RIPSAVS**S**PLN**S**PLDR	0.999	2	3	3.8	*
NUP98	Nuclear pore complex protein Nup98-Nup96	YGLQD**S**DEEEEEHPPK	1.000	1	3	4.9	*
NCOA3	Nuclear receptor coactivator 3	AV**S**LDSPVSVGSGPPVK	1.000	1	2	4.2	*
NSRP1	nuclear speckle splicing regulatory protein 1-like	VLQKPSVFGND**S**DDDDETSVSESLQR	1.000	1	3	4.2	*
NUCKS1	nuclear ubiquitous casein and cyclin-dependent kinases substrate-like	TSASSPLEK**S**GDEG**S**EDEAP**S**GED	1.000	3	2	4.2	*
NVL	nuclear valosin-containing protein isoform 2	ESLPLDL**S**DDQSNYK	1.000	1	2	2.7	
NOLC1	Nucleolar phosphoprotein p130	AGKE**S**EEDEEEEETK	1.000	1	2	2.9	*
NOLC1	Nucleolar phosphoprotein p130	LQ**T**PN**T**FPK	1.000	2	2	3.5	*
NOL8	Nucleolar protein 8	SSm**S**DDDID**S**EDELK	0.997	2	2	5.0	*
NOL8	Nucleolar protein 8	FLE**S**D**S**EEEEKELNENKTNEDELAAEK	0.999	2	3	4.0	*
TPR	Nucleoprotein TPR	EVVQTPLNV**S**VSEEGK	0.997	1	2	3.2	
OSTF1	osteoclast-stimulating factor 1-like	TLSNAEDYIDEED**S**D	1.000	1	2	2.3	*
OTUD7B	OTU domain-containing protein 7B-like	GI**S**HASSSIVSLAR	1.000	1	2	2.5	*
OSBP	Oxysterol-binding protein 1	mLAE**S**DE**S**GDEESVSQTDK	1.000	2	2	4.5	*
OSBPL11	oxysterol-binding protein-related protein 11	SF**S**LASSGNSPISQR	1.000	1	2	4.4	*
OSBPL11	oxysterol-binding protein-related protein 11	RP**S**QNAISFFNVGHSK	1.000	1	3	4.1	*
OSBPL3	Oxysterol-binding protein-related protein 3	ALVHQL**S**NESR	0.992	1	2	2.2	*
PALLD	palladin-like	IA**S**DEEIQGTK	1.000	1	2	4.0	*
PARD3B	Partitioning defective 3-like	**S**mDLGIADETK	1.000	1	2	2.8	*
PSIP1	PC4 and SFRS1-interacting protein	EAELSLKE**S**PLDN	0.998	1	2	3.2	
PSIP1	PC4 and SFRS1-interacting protein	NVAKPGVTST**S**D**S**EDEDDQEGGEK	1.000	2	3	5.8	*
PPIG	peptidyl-prolyl cis-trans isomerase G-like isoform 1	DQ**S**PVVLKPK	1.000	1	2	2.3	
BRPF1	Peregrin	RLPAL**S**H**S**EGEEEEDEEEDEGK	1.000	2	3	6.3	*
PCM1	Pericentriolar material 1 protein	VTNDI**S**PESSPGVGR	0.998	1	2	2.6	*

GIGYF1	PERQ amino acid-rich with GYF domain-containing protein 1	**S**IEEGDGAFGR	1.000	1	2	2.7	*
GIGYF2	PERQ amino acid-rich with GYF domain-containing protein 2 isoform 1	AGTEANEEAPQISLSSARPG**T**PSDPQPQEAPQLER	0.990	1	3	6.2	
PHIP	PH-interacting protein	VL**S**D**S**EEEEKDADVPGTSTR	1.000	2	3	4.3	*
PPP1R18	Phostensin	KEETLSPGIALDQ**S**PVTK	1.000	1	3	4.2	*
PPP1R18	Phostensin	DIETPQKPGPPA**S**PEK	1.000	1	2	2.2	*
PHLDB1	Pleckstrin-likey-like domain family B member 1	SALLAQNGTS**S**LPR	0.999	1	2	2.9	
PHLDB2	Pleckstrin-likey-like domain family B member 2	RL**S**AGTTVADVQK	0.998	1	2	3.2	*
PLEC	plectin	AQLEPVA**S**PAK	1.000	1	2	2.2	
PHC3	polyhomeotic-like protein 3-like isoform 1	mDR**T**PPPPTL**S**PAAITVGR	1.000	2	3	5.7	*
PTRF	polymerase I and transcript release factor-like	LPAKL**S**VSK	0.999	1	2	2.4	*
Ctla2b	protein CTLA-2-beta-like	YTEE**S**PTSENVEEK	0.998	1	2	3.7	*
DIAPH3	protein diaphanous homolog 3-like	GL**S**PAPPSGPHEPGEK	1.000	1	2	2.4	*
IWS1	Protein IWS1-like	TAA**S**D**S**EEEVGKEELSVK	0.995	2	2	2.3	*
IWS1	Protein IWS1-like	AAVL**S**D**S**EDEDKASAK	1.000	2	2	2.2	*
ZMYND8	Protein kinase C-binding protein 1	LPPSTAAGNQ**S**PPETPVLTR	1.000	1	2	5.5	*
LNP	Protein lunapark	AD**S**VSNLEPSGESLVTQ	0.990	1	2	3.7	
PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	SG**S**YSYLEER	0.991	1	2	2.4	*
PRRC2B	protein PRRC2B-like	LKF**S**DDEEEEEAVK	1.000	1	2	3.1	
PDCD11	protein RRP5 homolog	RD**S**ETADDKEEEEENSDLTVR	0.990	1	3	5.4	*
SCRIB	Protein scribble-like	N**S**LESISSIDR	1.000	1	2	2.6	*
SCRIB	Protein scribble-like	mK**S**LEQDALR	1.000	1	2	2.7	*
SAMD4B	Protein Smaug-like 2	AAFTTPDHAPL**S**PQSSVASSGSEQTEEQGSSR	0.992	1	3	7.5	*
SESTD1	Protein SOLO	IQQQLGEEA**S**PR	1.000	1	2	2.8	*
TIMELESS	Protein timeless-like	ELLD**S**DEEEDEGR	1.000	1	2	4.5	
SEC31A	Protein transport protein Sec31A	VDGSDVALKDPDQVAQ**S**DGEESPAAEEQLLGER	1.000	2	3	8.3	*
WIZ	Protein Wiz	KAPLTLAG**S**PTPK	0.991	1	2	2.9	*
WIZ	Protein Wiz	SPQLSLSPRPT**S**PK	0.998	2	2	2.9	
TATDN2	Putative deoxyribonuclease TATDN2	VTVTVPQKEE**S**PTK	0.999	1	2	2.3	*
DHX16	putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX16-like, partial	LLED**S**E**S**GEEAVGSDSSSLQK	1.000	2	3	4.1	*
RBM15	Putative RNA-binding protein 15	SL**S**PGGAALGYR	1.000	1	2	2.7	*
PYGO2	pygopus homolog 2-like	GGG**T**PDANSLAPPGK	1.000	1	2	2.6	
RIN2	Ras and Rab interactor 2	NS**S**FVLPK	1.000	1	2	2.4	
RMDN3	Regulator of microtubule dynamics protein 3	SH**S**LPDSLDR	1.000	1	2	2.5	*
RBL1	retinoblastoma-associated protein-like	KSNPDEEANVVTPH**T**PVR	1.000	2	3	4.1	*
ARHGAP29	rho GTPase-activating protein 29	**S**LDSESISPGDFHR	0.997	1	2	2.8	*
ARHGEF2	Rho guanine nucleotide exchange factor 2	ILSQ**S**TDSLNmR	0.998	1	2	3.6	*

ARHGEF5	rho guanine nucleotide exchange factor 5-like	SN**S**FPGFHR	1.000	1	2	2.6	*
ARHGEF7	rho guanine nucleotide exchange factor 7-like	KP**S**DEEFAVR	1.000	1	2	2.2	*
RNF219	RING finger protein 219	SVELEGSSK**S**PR	0.995	1	2	2.3	*
RBM39	RNA-binding protein 39 isoform a	DK**S**PVREPIDNLTPEER	1.000	1	3	4.0	
RBM39	RNA-binding protein 39 isoform a	IGLPH**S**IK	1.000	1	2	2.5	
RUNX1	Runt-related transcription factor 1	RFTPPSTAL**S**PGK	1.000	2	2	2.3	*
SAFB	Scaffold attachment factor B1	SVV**S**FDKVK	1.000	1	2	2.6	*
SAFB2	Scaffold attachment factor B2	APTASL**S**PEPQDSK	1.000	1	2	4.3	*
SRRM1	Serine/arginine repetitive matrix protein 1	RY**S**PPIQR	1.000	1	2	2.2	*
SRRM1	Serine/arginine repetitive matrix protein 1	**S**P**S**PAPPPPPPPR	1.000	2	2	2.9	*
SRRM2	Serine/arginine repetitive matrix protein 2	SRT**S**PAPWK	0.994	1	2	2.4	
SRRM2	Serine/arginine repetitive matrix protein 2	SIAQT**T**PVAGSQSLSSGTVAK	0.997	1	2	4.3	
SRRM2	Serine/arginine repetitive matrix protein 2	SGSVTNIQVDEHSA**T**PQR	0.999	1	2	3.3	*
SRRM2	Serine/arginine repetitive matrix protein 2	SEQPLSQVIQSL**S**PEHK	0.999	1	2	3.7	*
SRRM2	Serine/arginine repetitive matrix protein 2	mAPALSGANLT**S**PR	0.999	1	2	3.5	
SRRM2	Serine/arginine repetitive matrix protein 2	mScFSRP**S**m**S**PTPLDR	1.000	2	3	3.8	*
SRRM2	Serine/arginine repetitive matrix protein 2	HV**SSS**PESLKPTPAPGAR	1.000	3	3	3.9	*
SRRM2	Serine/arginine repetitive matrix protein 2	SSSEL**S**PEVVEK	1.000	1	2	2.4	
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PVPSAFSDQSR	1.000	1	2	2.3	*
SRRM2	Serine/arginine repetitive matrix protein 2	SEL**S**PEQVK	1.000	1	2	2.5	
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PGmLEPLGSAR	1.000	1	2	2.3	*
SRRM2	Serine/arginine repetitive matrix protein 2	GmLQ**T**PPEQNVPASK	1.000	1	2	2.4	
SRRM2	Serine/arginine repetitive matrix protein 2	NSGPISEVNAGF**S**PEVK	1.000	1	2	4.7	*
SRRM2	Serine/arginine repetitive matrix protein 2	**S**PVNQDKFELSTDPK	1.000	1	3	4.2	*
SRRM2	Serine/arginine repetitive matrix protein 2	**S**R**S**PLAIR	1.000	2	2	2.4	*
SRRM2	Serine/arginine repetitive matrix protein 2	TPAAAAAmNLA**S**PR	1.000	1	2	3.8	*
SRRM2	Serine/arginine repetitive matrix protein 2	**S**L**T**R**S**PPAIR	1.000	3	2	2.2	
SRRM2	Serine/arginine repetitive matrix protein 2	VP**S**PVPAPK	1.000	1	2	3.0	
STK11IP	Serine/threonine kinase 11-interacting protein	RA**S**ISEPSDTDPELR	1.000	1	2	3.0	*
PRKD1	Serine/threonine-protein kinase D1	TI**S**PSTSNNIPLmR	0.999	1	2	2.3	
NEK10	Serine/threonine-protein kinase Nek10	NGILASPQ**S**APGNLDNSK	1.000	1	2	4.3	*
NEK10	Serine/threonine-protein kinase Nek10	KH**S**DPHLLER	1.000	1	2	2.4	
PAK4	serine/threonine-protein kinase PAK 4	DKRPL**S**GPDVSTPQPANLASGAK	1.000	1	3	3.9	*
CDK14	Serine/threonine-protein kinase PFTAIRE-1	AD**S**YEKLEK	0.999	1	2	2.6	
PPP2R5D	Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform	RK**S**ELPQDVYTIK	1.000	1	2	2.4	*
SH3PXD2A	SH3 and PX domain-containing protein 2A	AQI**S**SPNLR	0.994	1	2	2.3	
SH3PXD2A	SH3 and PX domain-containing protein 2A	AA**S**QGSESPLLPTQR	0.995	1	2	2.4	
SH3PXD2A	SH3 and PX domain-containing protein 2A	NE**S**LTATDSLR	1.000	1	2	2.8	

SH3BP4	SH3 domain-binding protein 4-like	SY**S**LSELSVLQAK	1.000	1	2	4.2	*
PDS5B	Sister chromatid cohesion protein PDS5-like B	mETVSNASSSSNPS**S**PGR	0.990	1	2	4.6	
PDS5B	Sister chromatid cohesion protein PDS5-like B	IA**S**ESDEQQWPEEK	1.000	1	2	2.9	*
PDS5B	Sister chromatid cohesion protein PDS5-like B	AE**S**PESSAVESTQSTPQK	1.000	1	2	5.2	*
PDS5B	Sister chromatid cohesion protein PDS5-like B	HKEELLENEDEQN**S**PPK	1.000	1	3	3.9	*
SNUPN	Snurportin-1	LK**S**PPHSPGNLmDN	1.000	2	2	2.2	
SLC9A1	Sodium/hydrogen exchanger 1	SKEPSSPGTDDVFTPAPSD**S**PSSQR	0.994	1	3	4.5	
SLC9A1	Sodium/hydrogen exchanger 1	IG**S**DPLAYEPK	1.000	1	2	3.0	
SF3A1	splicing factor 3A subunit 1 isoform 1	AEEAPSQLDQDTQVQDmDEG**S**DDDEEGQK	1.000	1	3	5.7	*
SF3A1	splicing factor 3A subunit 1 isoform 1	FGESEEVEmEVE**S**DEEDEKQEK	1.000	1	3	5.9	*
SF3B2	Splicing factor 3B subunit 2	SSLGQ**S**ASETEEDTVSISK	1.000	2	2	3.3	*
SF3B2	Splicing factor 3B subunit 2	GFEEEHKD**S**DDD**SS**DDEQEKKPEAPK	1.000	3	3	4.2	*
SRSF4	Splicing factor, arginine/serine-rich 4	SKPSLPAE**S**R	0.996	1	2	2.3	
STARD13	stAR-related lipid transfer protein 13 isoform 1	KKGDD**S**DEEDLcISNK	1.000	1	3	4.7	*
SVIL	Supervillin	YQ**T**QPVTLGEVEQVQSGK	1.000	1	2	5.1	
SVIL	Supervillin	RG**S**LELGNPSVSHLGDEVK	1.000	1	3	4.8	*
SVIL	Supervillin	GTSFPEVPR**S**PK	1.000	1	2	2.8	
SFR1	swi5-dependent recombination DNA repair protein 1 homolog	VENT**S**DSESTKLESESDSTSVK	0.998	1	3	3.8	*
SYNPO2	Synaptopodin-2	AQ**S**PTPSLPASWK	1.000	1	2	2.8	
TLN2	Talin-2	LDEG**T**PPEPK	1.000	1	2	2.5	
TBC1D17	TBC1 domain family member 17	EPSSP**S**PPISPLPLSTR	1.000	2	2	3.4	
N/A	TEL2-interacting protein 1 homolog	EKDVAEGNV**S**DLETEEEEQSSTPK	1.000	1	3	5.2	
RIF1	Telomere-associated protein RIF1	RQ**S**FITLEK	1.000	1	2	3.4	*
RIF1	Telomere-associated protein RIF1	VTAE**S**PIQENLTEK	1.000	1	2	3.6	*
TJP1	tight junction protein ZO-1	**S**REDLSAQPVQTK	1.000	1	2	2.3	*
TJAP1	Tight junction-associated protein 1	KD**S**LTQAQEQGTLLS	0.998	1	2	3.7	
TNIK	Traf2 and NCK-interacting protein kinase	QN**S**DPTSENPPLPTR	1.000	1	2	2.8	
TRAF3IP1	TRAF3-interacting protein 1-like	RQE**S**TETLVGDR	0.999	1	2	3.2	*
SMARCA4	transcription activator BRG1-like	KIPDPD**S**DDVSEVDAR	0.992	1	2	2.9	
SUPT5H	Transcription elongation factor SPT5	DVTNLTVGGFTPm**S**PR	1.000	1	2	3.0	
JUN	transcription factor AP-1-like	LA**S**PELER	1.000	1	2	2.4	
Tfe3	transcription factor E3-like isoform 1	AASDPLLSSV**S**PAVSK	0.991	1	2	3.0	
JUNB	transcription factor jun-B-like	DA**T**PPV**S**PINmEDQER	1.000	2	2	3.1	
ATRX	Transcriptional regulator ATRX	VcDQTAKL**S**PK	1.000	1	2	2.9	*
ATRX	Transcriptional regulator ATRX	AA**S**EN**S**ENDITmQSLPK	1.000	2	2	3.9	*
TACC2	Transforming acidic coiled-coil-containing protein 2	LDNTPA**S**PPR**S**PTEPNDIPIAK	1.000	2	3	4.8	*
TMCO1	transmembrane and coiled-coil domains protein 1 isoform 1	ALGVISNFQS**S**PK	0.999	1	2	3.7	

TCOF1	Treacle protein	AVVHLLSGK**S**PK	1.000	1	2	2.3	*
TCOF1	Treacle protein	KL**S**GDQLAAGAPESK	1.000	1	2	3.8	*
N/A	Tripartite motif-containing protein 25	VTD**S**PAEEEEEAR	1.000	1	2	3.7	*
TRIM47	Tripartite motif-containing protein 47	GLG**S**DEDELQK	1.000	1	2	2.9	*
PUS1	tRNA pseudouridine synthase A, mitochondrial isoform 1	VPSSLEGSEGDGD**T**D	1.000	1	2	2.7	
TSC22D1	TSC22 domain family protein 4	VDVESGSSAAG**T**PPLSR	1.000	1	2	3.6	
TNFRSF10B	tumor necrosis factor receptor superfamily member 10B-like	APEEPEVAPEN**S**PmGR	1.000	1	2	2.9	*
TP53BP1	Tumor suppressor p53-binding protein 1	mESLA**S**PR**S**EGDGENTQIEDTEPL**S**PVTNSK	0.998	3	3	7.6	*
ABL2	Tyrosine-protein kinase ABL2	SAQASSG**S**PALPR	0.997	1	2	2.4	
ABL2	Tyrosine-protein kinase ABL2	DK**S**PSSLLEDAK	1.000	1	2	3.7	
PTPN14	Tyrosine-protein phosphatase non-receptor type 14	RH**S**LEVmNSmVR	1.000	1	3	4.0	
PTPN21	Tyrosine-protein phosphatase non-receptor type 21	SLSDATmLIH**SS**EEEEDLDEDHSR	1.000	2	3	4.7	
SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa	YDERPGP**S**PLPHR	1.000	1	3	3.8	*
SNRNP70	U1 small nuclear ribonucleoprotein 70 kDa-like	GGGG**S**GQDNGLEGLGSDGR	1.000	1	2	3.6	*
SNRNP200	U5 small nuclear ribonucleoprotein 200 kDa helicase	EEA**S**DDDmEGDEAVVR	1.000	1	2	4.2	*
UBXN7	UBX domain-containing protein 7	SESLIDASED**S**QLEAAIR	1.000	1	2	4.9	*
KIAA1551	uncharacterized protein C12orf35 homolog	NTFLVQSV**S**PEK	0.998	1	2	2.5	
N/A	uncharacterized protein C14orf43-like isoform 1	RA**S**QEANLLTLAQK	1.000	1	2	4.6	*
C18orf25	Uncharacterized protein C18orf25	RD**S**SESQLASTESDKPTAGR	0.998	1	3	3.8	*
CACTIN	uncharacterized protein C19orf29 homolog	**S**PGATALALSQQQSLQER	1.000	1	2	5.4	
SOGA1	Uncharacterized protein C20orf117	TGQPPQPAPSGQQPPRPPA**S**PDEPSVAASSVGSSR	1.000	1	3	4.0	
UTRN	Utrophin	AQT**S**LNSLNDLTK	0.992	1	2	3.5	
Wipf1	WAS/WASL-interacting protein family member 1-like	NL**S**LTSSAPPLPSPGR	0.999	1	2	4.2	*
ZC3H13	Zinc finger CCCH domain-containing protein 13	AAVVA**S**PLLDQQR	1.000	1	2	4.3	*
ZC3H14	Zinc finger CCCH domain-containing protein 14	DLVQPDKPA**S**PK	1.000	1	2	2.8	*
ZC3H18	zinc finger CCCH domain-containing protein 18 isoform 2	LGVSV**S**PSR	0.992	1	2	2.7	
ZC3HAV1	zinc finger CCCH-type antiviral protein 1	**S**AGNLLDLQITSR	1.000	1	2	4.0	*
ZNF280C	Zinc finger protein 280C	NP**S**PNPVTALPK	1.000	1	2	2.8	
ZFR	Zinc finger RNA-binding protein	RD**S**DGVDGFEAEGK	1.000	1	2	4.3	*
ZHX2	zinc fingers and homeoboxes protein 2-like	VAEGTADRPD**S**D**S**DSAPAEAGHA	0.997	2	2	3.4	*
ELAC2	zinc phosphodiesterase ELAC protein 2-like, partial	ALTEEPH**S**PQSK	1.000	1	2	3.1	*

Table 4.3.22: List of phosphopeptides identified following LC/MS analysis of Titanium Dioxide phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO BB database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr	MS3
PDAP1	28 kDa heat- and acid-stable phosphoprotein	SLD**S**DE**S**EDEDDDYQQK	1.000	2	2	5.7	*
RSRC2	Arginine/serine-rich coiled-coil protein 2	KKEQSDVSI**S**PR	0.999	1	2	2.2	*
ARMC10	Armadillo repeat-containing protein 10	**S**AEDLTDGSYDEVLNAK	1.000	1	2	5.4	*
ABCF1	ATP-binding cassette sub-family F member 1	FAALD**S**EEEDDEETTEEK	1.000	1	2	5.3	*
BAG3	BAG family molecular chaperone regulator 3	AA**S**PFR**S**PVR	1.000	2	2	2.3	
LIG3	DNA ligase 3	VTTTGQVS**S**PVK	0.993	1	2	3.4	
TOP2A	DNA topoisomerase 2-alpha	AQmSEVLP**S**PHGK	0.996	1	2	3.4	*
DNAJC5	DnaJ homolog subfamily C member 5	SL**S**TSGESLYHVLGLDK	0.998	1	2	3.2	*
FXR1	Fragile X mental retardation syndrome-related protein 1	AINGPTSA**S**GDEIPK	1.000	1	2	3.7	*
USO1	General vesicular transport factor p115	NLGHPVEEEDE**S**GDQEDDDDEmDDGDKDQDx	1.000	1	3	8.5	*
NAF1	H/ACA ribonucleoprotein complex non-core subunit NAF1	NDQEPPPEALDF**S**DDEKEK	1.000	1	2	3.8	*
Htatsf1	HIV Tat-specific factor 1 homolog	LFDD**S**DER	1.000	1	2	2.8	
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	QDFESL**S**PPR	1.000	1	2	2.3	
Tmpo	Lamina-associated polypeptide 2, isoforms alpha/zeta	SQVI**S**PPLAR	1.000	1	2	3.1	
MTBP	Mdm2-binding protein	GEKPLVLTPEL**S**PR	1.000	1	2	3.1	*
SLC16A1	Monocarboxylate transporter 1	ATESPQQNSSGDPAEEE**S**PV	1.000	1	2	3.3	
AHNAK	Neuroblast differentiation-associated protein AHNAK	LP**S**GSGVASPTTGSAmDIR	0.995	1	2	4.2	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GGVTG**S**PEASISGSK	1.000	1	2	2.9	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GHYEVTG**S**DDEAVK	1.000	1	2	4.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	FGTFGGLG**S**K	1.000	1	2	2.3	
AHNAK	Neuroblast differentiation-associated protein AHNAK	FKAEASLP**S**PK	1.000	1	2	2.9	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	VG**S**PGVNVSAK	1.000	1	2	2.7	
AHNAK	Neuroblast differentiation-associated protein AHNAK	GSGIGLHDV**S**VK	1.000	1	2	2.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	I**S**mADVDLNVASPK	1.000	1	2	2.5	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	GP**S**VDIDTPDVNIEGPEGK	1.000	1	2	5.2	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	ASLG**S**LEGEADAEASSPK	1.000	2	2	5.3	*
AHNAK	Neuroblast differentiation-associated protein AHNAK	IKGDVPSVGLEGPDIDLQ**S**PEGK	1.000	1	3	5.6	*
NUMA1	Nuclear mitotic apparatus protein 1	LPcTQPDGTSVPGEPA**S**PISQR	1.000	1	2	2.8	
NCL	Nucleolin	EVEED**S**EDEEm**S**EDEEDDSSGEEVVIPQKK	1.000	2	3	4.9	
INPPL1	Phosphatidylinositol-3,4,5-trisphosphate 5-phosphatase 2	DA**S**DVEDEKPPLPPR	1.000	1	2	3.1	*

AHCTF1	Protein ELYS	TTPLASPSL**S**PGR	0.998	1	2	2.6	
NDRG1	Protein NDRG1	TA**S**GSSVTSLEGPR	0.994	1	2	3.7	*
EBAG9	Receptor-binding cancer antigen expressed on SiSo cells	KL**S**GDQITLPTSVDYSSVPK	1.000	1	2	5.3	*
ATP2A2	Sarcoplasmic/endoplasmic reticulum calcium ATPase 2	EFDELSP**S**AQR	0.999	1	2	2.5	
SRSF2	Serine/arginine-rich splicing factor 2	**S**K**S**PPKSPEEEGAVSS	1.000	3	2	2.7	*
STMN1	Stathmin	ESVPDFPL**S**PPK	1.000	1	2	2.8	
UTP18	U3 small nucleolar RNA-associated protein 18 homolog	GHLHG**SS**DD**S**EVEDEAKDTLPSQK	1.000	3	3	4.6	*
USP7	Ubiquitin carboxyl-terminal hydrolase 7	AGEQQL**S**EPEDmEmEAGDTDDPPR	1.000	1	3	4.8	*
UBE2J1	Ubiquitin-conjugating enzyme E2 J1	RS**S**TSPDVIQGQPPR	0.999	1	2	3.4	*
ZMYM4	Zinc finger MYM-type protein 4	ASHHE**S**DNENEIQIQNK	0.991	1	3	4.1	*
ZNF438	Zinc finger protein 828	TGPSL**S**PEPQK	0.992	1	2	2.9	*
AEBP2	Zinc finger protein AEBP2	RG**S**LEmSSDGEPLSR	0.999	1	2	3.1	
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	YNLDA**S**EEEDSNK	1.000	1	2	4.5	*
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	EVEDKE**S**EGEDEDEDEDLSK	1.000	1	2	3.2	*

Table 4.3.23: List of phosphopeptides identified following LC/MS analysis of Gallium phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be common to CHO BB and CHO NCBI protein databases.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr
TNKS1BP1	182 kDa tankyrase-1-binding protein	VP**SS**DEEVVEEPQSR	1.000	2	2	2.5
TNKS1BP1	182 kDa tankyrase-1-binding protein	WLDDLLA**S**PPPNSGSAR	1.000	1	2	3.7
ATXN2L	Ataxin-2-like protein	EVDGLLTSDPMG**S**PVSSK	0.999	1	2	2.8
BCLAF1	Bcl-2-associated transcription factor 1	FND**S**EGDDTEETEDYR	1.000	1	2	2.6
BCLAF1	Bcl-2-associated transcription factor 1	DLFDY**S**PPLHK	0.995	1	2	3.3
BCLAF1	Bcl-2-associated transcription factor 1	KAEGEPQEE**S**PLK	1.000	1	2	2.6
PRKAR2A	cAMP-dependent protein kinase type II-alpha regulatory subunit-like, partial	RV**S**VcAESYNPDEEEEDTEPK	1.000	1	2	2.4
NCAPG	Condensin complex subunit 3	AIQcEDEEIN**S**DDEQEAK	1.000	1	2	3.4
LIG1	DNA ligase 1-like	AAQVL**SS**EGEEEDEAPSTPK	1.000	2	2	3.3
DNAJC2	DnaJ homolog subfamily C member 2	KEL**S**EG**S**EDEELQLEEFPMLK	1.000	2	2	3.7
EEF1B2	elongation factor 1-beta-like	DDDDIDLFG**S**DDEEESEEAK	1.000	1	2	3.3
EEF1D	Elongation factor 1-delta	AATPAEDDEDDDIDLFG**S**DEEEEDK	1.000	1	2	3.6
EPS15L1	epidermal growth factor receptor substrate 15-like	LNDPFQPFPGND**S**PK	1.000	1	2	2.9
FNBP4	Formin-binding protein 4	ATGGLcLLGAYAD**S**DDDESDVSEK	1.000	1	2	4.0
HSP90AA1	Heat shock protein HSP 90-alpha	DKEV**S**DDEAEEK	1.000	1	2	2.2
HDGF	Hepatoma-derived growth factor	GNAEG**SS**DEEGKLVIDEPAK	1.000	2	2	3.5
HNRNPU	Heterogeneous nuclear ribonucleoprotein U	AK**S**PQPPVEEEDEHFDDTVVcLDTYNcDLHFK	1.000	1	3	5.3
Q13547	Histone deacetylase 1	MLPHAPGVQMQAIPEDAIPEE**S**GDEDEEDPDKR	1.000	1	3	4.0
KPNA4	importin subunit alpha-3	NVPQEESLED**S**DVDADFK	0.998	1	2	2.7
SLC4A1AP	Kanadaptin	mLGED**S**DEEEETDTTEGK	1.000	1	2	2.6
DBR1	Lariat debranching enzyme	SGETVE**S**GDEKDLSEFPVK	1.000	1	2	2.5
LUZP1	Leucine zipper protein 1	EKPD**S**DDDLDIESLVTAK	1.000	1	2	2.3
MARK3	MAP/microtubule affinity-regulating kinase 3	LD**T**FcGSPPYAAPELFQGK	1.000	1	2	2.5
MYH9	Myosin-9	KGTGDc**S**DEEVDGK	0.997	1	2	2.5
NELFE	Negative elongation factor E	SV**S**ADEDLQESSR	1.000	1	2	2.8
NPM1	Nucleophosmin	cGSGPVHISGQHLVAVEEDAE**S**EDEDEEDVK	1.000	1	3	4.4
NPM1	Nucleophosmin	DELHIVEAEAmNYEG**S**PIK	1.000	1	3	3.9
NPM3	Nucleoplasmin-3	IVcINNDL**S**EE**S**EDDESEEGEVK	1.000	2	2	4.6
SIN3A	Paired amphipathic helix protein Sin3a	GDL**S**DVEEEEEEEMDVDEATGAPK	1.000	1	2	4.4
PALLD	Palladin	SRD**S**GDENEPIQER	0.995	1	2	2.5
DEK	protein DEK-like	DE**S**EEEEDDDEDEDEEEEKEK	1.000	1	2	3.6

FAM122A	Protein FAM122A	RIDFIPV**S**PAP**S**PTR	1.000	2	2	3.8
RPRD2	Regulation of nuclear pre-mRNA domain-containing protein 2	DVEDmEL**S**DVEDDGSK	1.000	1	2	2.6
RRM2	Ribonucleoside-diphosphate reductase subunit M2	VPLATITDQQQLQV**S**PLK	1.000	1	2	5.5
SEPT2	Septin-2	IYHLPDAE**S**DEDEDFK	1.000	1	2	3.3
SEPT9	Septin-9	**S**FEVEEIEPPNSTPPR	1.000	1	2	3.4
SRPK1	Serine/threonine-protein kinase SRPK1	GSAPHSESDIPEQEEEILG**S**DDDEQEDPNDYcK	1.000	1	3	4.7
SPTBN1	spectrin beta chain, brain 1 isoform 1	GDQVSQNGLPAEQG**S**PR	1.000	1	2	2.5
SMARCC2	SWI/SNF complex subunit SMARCC2	DmDEP**S**PVPNVEEVTLPK	1.000	1	2	3.5
USP14	Ubiquitin carboxyl-terminal hydrolase 14	A**S**GEmASAQYITAALR	1.000	1	2	2.9
UFD1L	ubiquitin fusion degradation protein 1 homolog	FVAFSGEGQ**S**LR	1.000	1	2	2.3
N/A	uncharacterized protein C6orf203 homolog	DADEED**S**DEETHLPER	1.000	1	2	2.5
C1orf52	UPF0690 protein C1orf52 homolog	LLPEGEETVE**S**DDDKDER	1.000	1	2	3.1
VPS4B	Vacuolar protein sorting-associated protein 4B	GND**S**DGEAESDDPEK	1.000	1	2	2.5

Table 4.3.24: List of phosphopeptides identified following LC/MS analysis of Gallium phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO NCBI database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Charge	XCorr
RPS3	40S ribosomal protein S3	DEILPT**T**PISEQK	0.999	1	2	2.6
XRN2	5'-3' exoribonuclease 2	AED**S**D**S**EPEPEDNVR	1.000	2	2	2.6
AKAP12	A-kinase anchor protein 12	GLSEAQQEGEAEEGAT**S**DGEK	0.994	1	2	2.7
ATXN2L	Ataxin-2-like protein	GPPQ**S**PVFEGVYNNSR	1.000	1	2	3.2
ACLY	ATP-citrate synthase	AKPAMPQDSVP**S**PR	1.000	1	2	2.5
EPB41L2	Band 4.1-like protein 2	EVTENEQNQL**S**EPEEGK	1.000	1	2	2.7
EPB41L2	Band 4.1-like protein 2	GSQPGPAVESQS**S**PR	0.993	1	2	2.2
BCLAF1	Bcl-2-associated transcription factor 1	IDI**S**PSALR	1.000	1	2	2.6
PRKAR1A	cAMP-dependent protein kinase type I-alpha regulatory subunit	EDEI**S**PPPPNPVVK	1.000	1	2	2.6
CDK11A	Cyclin-dependent kinase 11	DLLSDLQDI**S**DSER	1.000	1	2	3.1
CSRP1	cysteine and glycine-rich protein 1-like	GFGFGQGAGALVH**S**E	1.000	1	2	3.6
DNAJC2	DnaJ homolog subfamily C member 2	NA**S**TSFQELEDK	0.999	1	2	2.4
RANBP2	E3 SUMO-protein ligase RanBP2	GAEDDEG**S**DEEVVHNEDIHFEPIVSLPEVEVK	1.000	1	3	4.4
HSP90B1	Endoplasmin	TETVEEPLEEDEAAKEEKEE**S**DDEAAVEEEEEEK	1.000	1	3	4.7
EIF4B	Eukaryotic translation initiation factor 4B	YAAL**S**VDGEDENEGDDHAE	1.000	1	2	4.1
EIF5	Eukaryotic translation initiation factor 5	EAEEE**SS**GGEEEDEDENIEVVYSK	1.000	2	2	2.6
ALDOA	Fructose-bisphosphate aldolase A	GILAADESTG**S**IAK	0.999	1	2	2.4
GPHN	Gephyrin	EVHDELEDLP**S**PPPPL**S**PPPTT**S**PHK	0.991	3	3	4.1
DKC1	H/ACA ribonucleoprotein complex subunit 4	TVLESGGEAGDGD**S**DTTK	1.000	1	2	4.0
HSP90AA1	Heat shock protein HSP 90-alpha	ESDDKPEIEDVG**S**DEEEEEK	1.000	1	3	4.0
HSP90AB1	heat shock protein HSP 90-beta-like	IEDVG**S**DEEDDSGK	1.000	1	2	3.7
HDGF	Hepatoma-derived growth factor	AGDMLED**S**PK	1.000	1	2	2.5
HDGFRP2	Hepatoma-derived growth factor-related protein 2	GG**SS**GEELEDNEPVK	1.000	2	2	3.9
HDAC2	Histone deacetylase 2	IAcDEEF**S**DSEDEGEGGR	0.998	1	2	2.8
LARP1B	La-related protein 1B	LDGPVENV**S**EDEAQSSSQR	1.000	1	2	2.3
LRRFIP2	Leucine-rich repeat flightless-interacting protein 2	RG**S**GDTSSLVDPDTSLSELR	1.000	1	2	4.0
LIMA1	LIM domain and actin-binding protein 1	**S**LDDLEIGLGHLSSSSFNSEK	1.000	1	2	2.4
METTL10	Methyltransferase-like protein 10	EG**S**PVAADFVPSALGTR	1.000	1	2	3.6
TOMM34	Mitochondrial import receptor subunit TOM34	VP**S**AGDVER	1.000	1	2	2.2
MORC2	MORC family CW-type zinc finger protein 2A	SLAV**S**DEEEAEEEAEK	1.000	1	2	2.5
NACA	Nascent polypeptide-associated complex subunit alpha	VQGEAVSNIQENTQTPTVQEE**S**EEEEVDETGVEVK	0.995	1	3	4.2

NFIC	Nuclear factor 1 C-type	NWTEDIEGGIS**S**PVK	0.997	1	2	3.9
NOLC1	Nucleolar phosphoprotein p130	AGKE**S**EEDEEEEETK	1.000	1	2	3.5
NAP1L1	Nucleosome assembly protein 1-like 1	LDGLVD**T**PTGYIESLPK	0.997	1	2	4.1
OTUD4	OTU domain-containing protein 4	EE**SS**EDENEVSNILK	1.000	2	2	2.4
PI4KB	Phosphatidylinositol 4-kinase beta	**S**VENLPEcGITHEQR	1.000	1	2	2.7
PDIA6	Protein disulfide-isomerase A6	DGELPVEDDIDL**S**DVELDDLEK	1.000	1	2	3.9
PRKCD	Protein kinase C delta type	Ac**T**FcGTPDYIAPEILQGLK	0.993	1	2	2.7
N/A	Putative GTP-binding protein Parf	NISL**SS**EEEDEGLAGHPR	1.000	2	2	2.5
RANBP1	Ran-specific GTPase-activating protein	FA**S**ENDLPEWK	1.000	1	2	3.2
G3BP1	Ras GTPase-activating protein-binding protein 1	SA**S**PAPADVAPAQEDLR	0.991	1	2	4.7
RSF1	Remodeling and spacing factor 1	IE**S**DEEEDFENVGK	1.000	1	2	3.1
SEPT8	Septin-7	IYEFPE**T**DDEEENK	1.000	1	2	2.6
SMAP	Small acidic protein	SA**S**PDDDLGSSNWEAADLGNEER	0.990	1	2	6.8
SMN1	Survival motor neuron protein	GTGQ**S**DDSDIWDDTALIK	0.999	1	2	2.7
RIF1	Telomere-associated protein RIF1	VTAE**S**PIQENLTEK	1.000	1	2	2.3
TNS1	Tensin-1	HLGGSGSVVPG**S**PSLDR	0.997	1	2	2.2
TCOF1	Treacle protein	KL**S**GDQLAAGAPESK	1.000	1	2	3.9
TMOD3	Tropomodulin-3	DLDEDELLNNL**S**ETELK	1.000	1	2	4.6
VWA5A	von Willebrand factor A domain-containing protein 5A	AYV**S**LDSMEDEESESK	0.999	1	2	2.9
DPF2	Zinc finger protein ubi-d4	VDDD**S**LGEFPVTNSR	1.000	1	2	2.2
ZFR	Zinc finger RNA-binding protein	RD**S**DGVDGFEAEGK	1.000	1	2	3.1

Table 4.3.25: List of phosphopeptides identified following LC/MS analysis of Gallium phosphopeptide enriched samples from temperature shifted and non-temperature shifted CHO SEAP whole cell lysates taken down 36 hours post temperature shift that were found to be unique to the CHO BB database.

Gene Symbol	Description	Sequence	phosphoRS Isoform Probability	Number of Phosphorylated Sites	Peptide Charge	XCorr
PDAP1	28 kDa heat- and acid-stable phosphoprotein	SLD**S**DE**S**EDEDDDYQQK	1.000	2	2	2.8
ABCF1	ATP-binding cassette sub-family F member 1	FAALD**S**EEEDDEETTEEK	1.000	1	2	2.7
PRKAR2B	cAMP-dependent protein kinase type II-beta regulatory subunit	RA**S**VcAEAYNPDEEEDDAESR	1.000	1	3	4.0
AHNAK	Neuroblast differentiation-associated protein AHNAK	ASLG**S**LEGEADAEASSPK	0.996	1	2	2.9
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	ND**S**WGSFDLR	1.000	1	2	2.3
SASH1	SAM and SH3 domain-containing protein 1	SH**S**LDDLQGEADAGK	1.000	1	2	2.9
SF1	Splicing factor 1	R**S**P**S**PEPIYNSEGK	1.000	2	2	2.4
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	EVEDKE**S**EGEDEDEDEDLSK	1.000	1	2	2.9
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	YNLDA**S**EEEDSNK	1.000	1	2	3.1