

Supporting Information

Copper chaperone Atox1 interacts with cell cycle proteins

By Maria Matson Dzebo, Stéphanie Blockhuys, Sebastian Valenzuela, Emanuele Celauro,
Elin K. Esbjörner and Pernilla Wittung-Stafshede

Content

Figures S1-S4

Table S1 (co-IP in HEK293T cells)

Table S2 (co-IP in MDA-MB-231 cells)

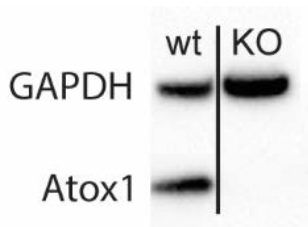
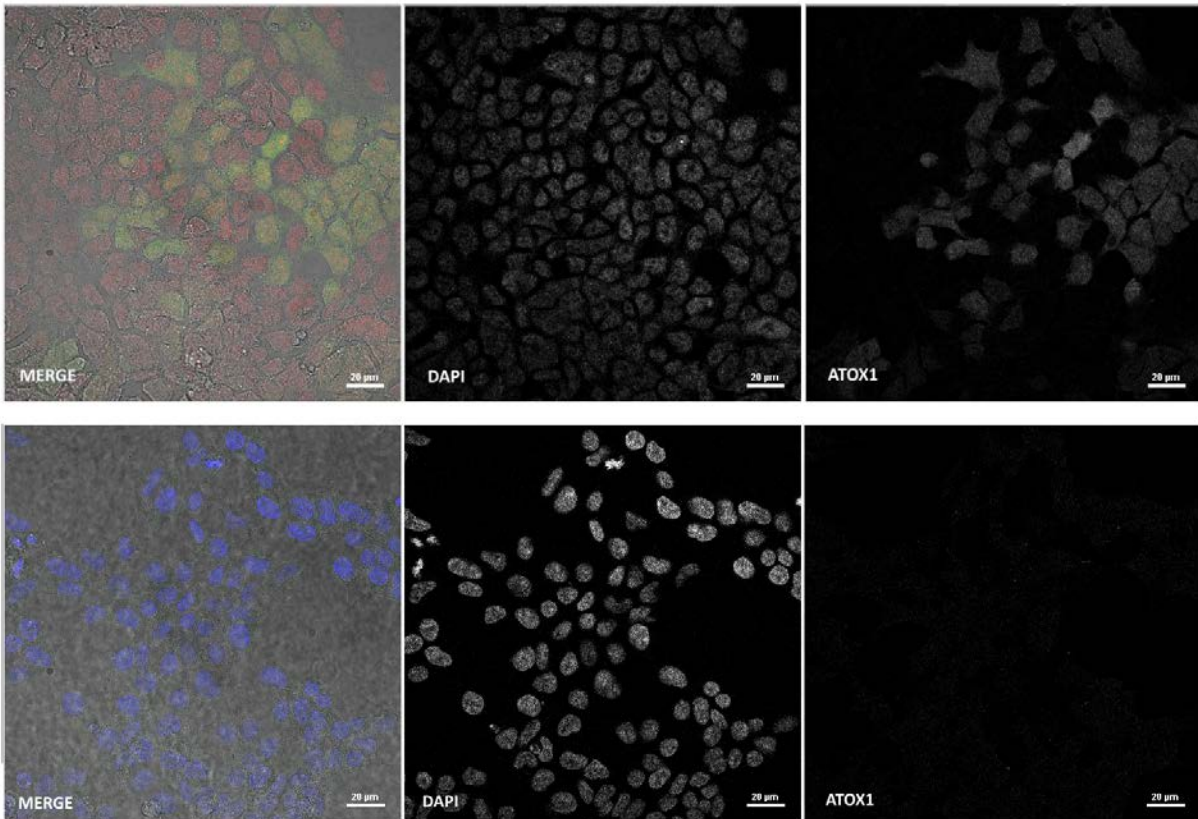


Figure S1. LoxP cassettes knock-in, followed by Cre-mediated excision, was used to knock-out the *Atox1* gene in HEK293T cells. The success rate of resulting *Atox1* deletion was estimated to be 70 %, based on immunostaining (top panel, *Atox1* signal in green). Subsequent selections by dilution resulted in the isolation of monoclonal cell lines with complete lack of *Atox1* expression (middle panel, representative image from the cell line, clone B10, used in this paper). Successful and irreversible removal of the *Atox1* gene was also confirmed by Western blot (bottom, GAPDH used for normalization).

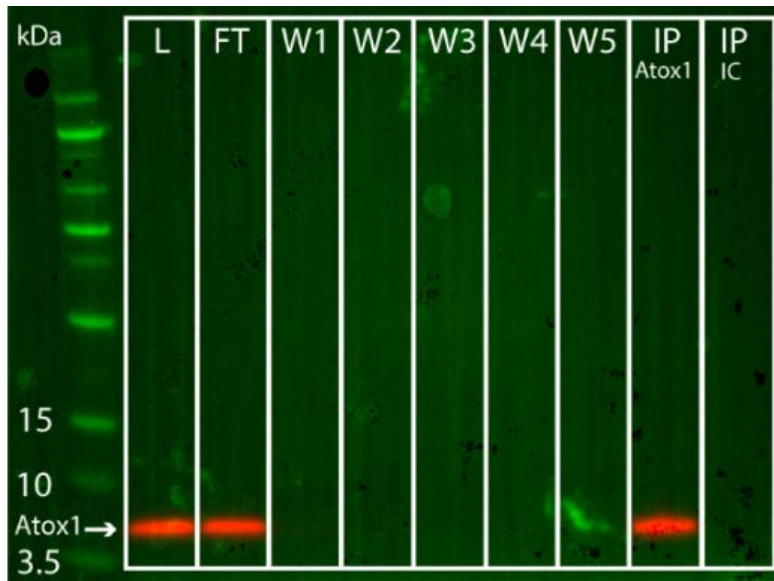


Figure S2. Detection of Atox1 in co-IP samples using western blot (red) and colorimetric detection of the protein standard (green). (Abbreviations: L is the lysate, FT the flow through, W1-5 are washes, IP are the immunoprecipitates where IC is isotype control).

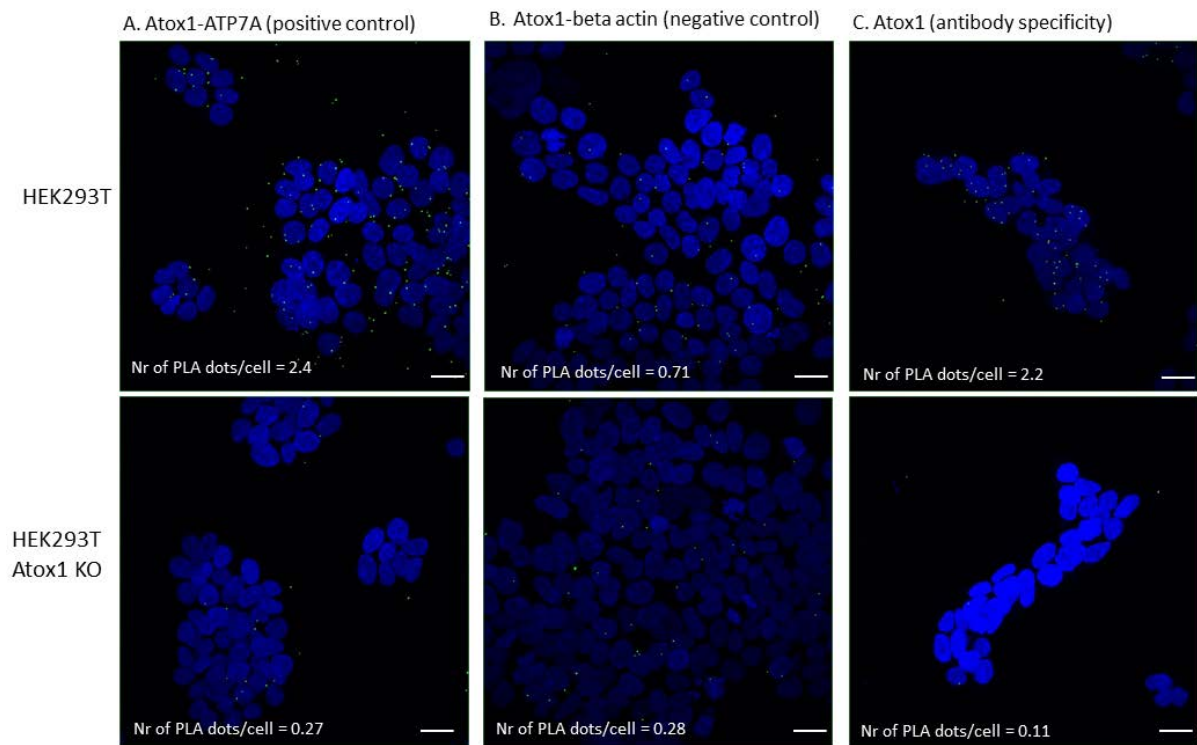
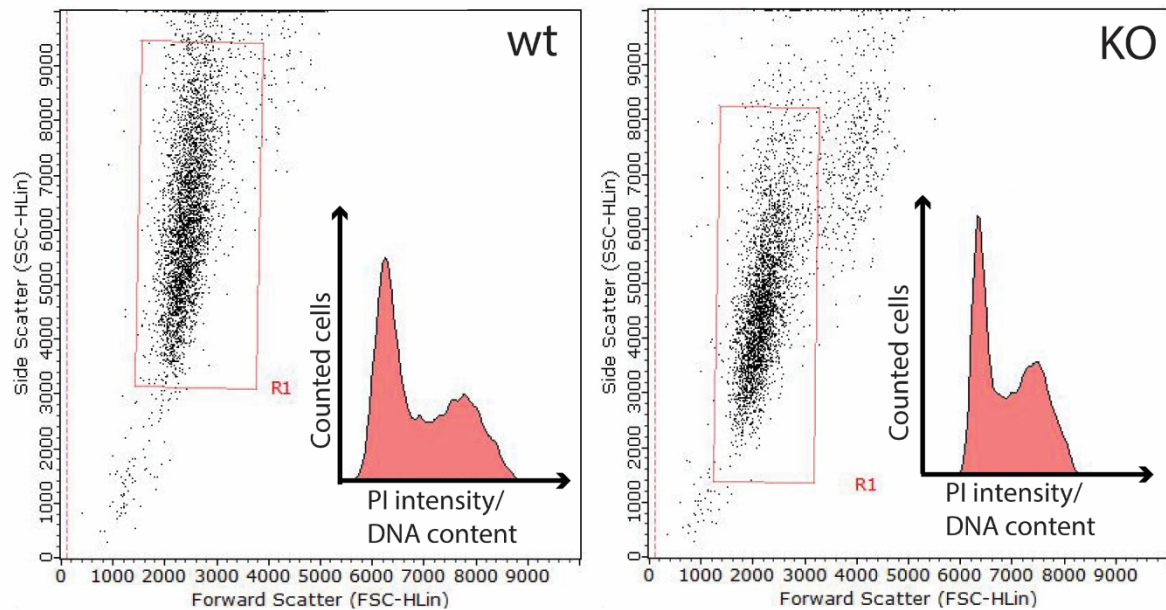


Figure S3. PLA controls. A. Positive control: Atox1-ATP7A interactions detected in wt (upper image) but not in Atox1 KO HEK293T cells (lower image), B. Negative control: Atox1-beta actin interactions not detected in both wt (upper image) and Atox1 KO HEK293T cells (lower image), C. Anti-Atox1 antibody specificity control: Atox1 detected in wt (upper image) cells but not in Atox1 KO HEK293T cells (lower image). Scale bars indicate 20 μm . The number of PLA dots found on average per cell for the presented image is written in the lower left corner.

A.



B.

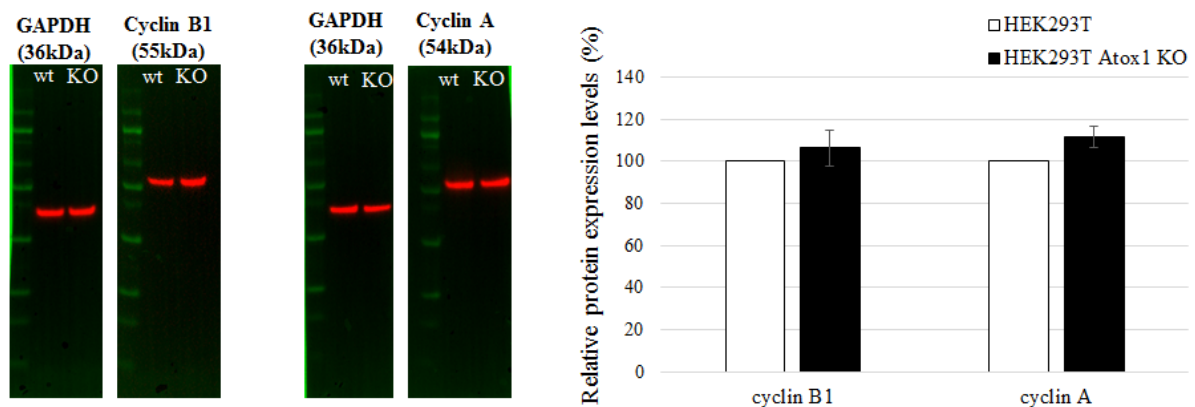


Fig. S4. A. Forward and side scatter plots in flow cytometry experiment of wt and KO cells (after gating cells in red area vs width plot), as well as the intensity of propidium iodide (PI), corresponding to DNA content, of the two cell lines. Notably the side scattering is reduced for KO cells, indicating less granularity of these cells. The PI intensity of the cell lines was evaluated for three independent experiments (with three technical repeats each) for the cell types, respectively, and the percentage of cells in the different phases are presented in Fig. 3A. **B.** Western blot for cyclin B1 and cyclin A in wt and Atox1 KO HEK293T cells. Left: Representative immunoblot results (wt=HEK293T and KO=HEK293T Atox1 KO, GAPDH as a loading control). Right: Quantitative Western blot results. Error bars indicate standard error of the mean ($n_{\text{cyclinB1}}=4$; $n_{\text{cyclinA}}=3$).

Table S1. Proteomic analysis of co-IP with Atox1 antibody as bait in HEK293T cells

In bold are proteins identified in co-IP with anti-Atox1 monoclonal antibody but not in co-IP with monoclonal IgG isotype antibody as bait (i.e., hits). APC subunits underlined. See Materials for details.

Accession/Uniprot	Description: protein name (alternative name)	MW [kDa]	# Peptides Atox1 Ab co-IP	# Peptides Control Ab co-IP
P04264	Keratin, type II cytoskeletal 1	66,00	35,00	34,00
Q9H1A4	Anaphase-promoting complex subunit 1	216,36	28,00	
Q9UJX3	Anaphase-promoting complex subunit 7	66,81	24,00	
P35908	Keratin, type II cytoskeletal 2 epidermal	65,39	31,00	33,00
P13645	Keratin, type I cytoskeletal 10	58,79	29,00	29,00
P35527	Keratin, type I cytoskeletal 9	62,03	21,00	20,00
P30260	Cell division cycle protein 27 homolog (ANAPC3)	91,81	20,00	
O53H12	Acylglycerol kinase, mitochondrial	47,11	15,00	7,00
P24752	Acetyl-CoA acetyltransferase, mitochondrial	45,17	12,00	13,00
Q9UJX4	Anaphase-promoting complex subunit 5	85,02	14,00	
P30613	Pyruvate kinase PKLR	61,79	13,00	7,00
P08670	Vimentin OS=Homo sapiens	53,62	16,00	7,00
Q9UJX2	Cell division cycle protein 23 homolog (ANAPC8)	68,79	13,00	
Q16891	MICOS complex subunit MIC60	83,63	12,00	5,00
P0DMV8	Heat shock 70 kDa protein 1A	70,01	14,00	13,00
P11142	Heat shock cognate 71 kDa protein	70,85	15,00	14,00
P13647	Keratin, type II cytoskeletal 5	62,34	21,00	23,00
Q9BY77	Polymerase delta-interacting protein 3	46,06	11,00	6,00
P08779	Keratin, type I cytoskeletal 16	51,24	21,00	20,00
P23396	40S ribosomal protein S3	26,67	11,00	7,00
P82979	SAP domain-containing ribonucleoprotein	23,66	11,00	
Q9UJX6	Anaphase-promoting complex subunit 2	93,77	10,00	
P25705	ATP synthase subunit alpha, mitochondrial	59,71	10,00	8,00
Q13042	Cell division cycle protein 16 homolog (ANAPC6)	71,61	10,00	
P11940	Polyadenylate-binding protein 1	70,63	10,00	4,00
Q94826	Mitochondrial import receptor subunit TOM70	67,41	10,00	
P06576	ATP synthase subunit beta, mitochondrial	56,52	8,00	6,00
Q9NX63	MICOS complex subunit MIC19	26,14	8,00	6,00
P62829	60S ribosomal protein L23	14,86	9,00	6,00
P62280	40S ribosomal protein S11	18,42	9,00	5,00
P62701	40S ribosomal protein S4, X isoform	29,58	9,00	4,00
P10809	60 kDa heat shock protein, mitochondrial	61,02	7,00	5,00
P15924	Desmoplakin	331,57	5,00	8,00
P68104	Elongation factor 1-alpha 1	50,11	8,00	5,00
Q99623	Prohibitin-2	33,28	8,00	8,00
P35232	Prohibitin	29,79	6,00	7,00
Q9UHX1	Poly(U)-binding-splicing factor PUF60	59,84	8,00	7,00
Q9UM13	Anaphase-promoting complex subunit 10	21,24	7,00	
Q9UJX5	Anaphase-promoting complex subunit 4	92,06	7,00	
P02533	Keratin, type I cytoskeletal 14	51,53	22,00	18,00
Q13724	Mannosyl-oligosaccharide glucosidase	91,86	7,00	
P22061	Protein-L-isoaspartate(D-aspartate) O-methyltransferase	24,62	5,00	7,00
O43175	D-3-phosphoglycerate dehydrogenase	56,61	6,00	6,00
Q95831	Apoptosis-inducing factor 1, mitochondrial	66,86	5,00	5,00
Q9NVI7	ATPase family AAA domain-containing protein 3A	71,32	19,00	8,00
P09669	Cytochrome c oxidase subunit 6C	8,78	6,00	2,00
Q6P1Q0	LETM1 domain-containing protein 1	41,76	6,00	
P27816	Microtubule-associated protein 4	120,93	4,00	4,00
Q14244	Enscnsln	84,00	4,00	5,00
Q7KZ17	Serine/threonine-protein kinase MARK2	87,86	6,00	5,00
P51955	Serine/threonine-protein kinase Nek2	51,73	6,00	
P09874	Poly [ADP-ribose] polymerase 1	113,01	6,00	
Q9NXS2	Glutaminy-peptide cyclotransferase-like protein	42,90	6,00	1,00
Q9Y310	tRNA-splicing ligase RtcB homolog	55,17	5,00	2,00
Q96DA6	Mitochondrial import inner membrane translocase subunit TIM4	12,49	6,00	4,00
P60709	Actin, cytoplasmic 1	41,71	4,00	3,00
P02768	Serum albumin	69,32	4,00	4,00
P48047	ATP synthase subunit O, mitochondrial	23,26	5,00	2,00
Q12834	Cell division cycle protein 20 homolog	54,69	5,00	
Q9UJS0	Calcium-binding mitochondrial carrier protein Aralar2	74,13	5,00	1,00
P17844	Probable ATP-dependent RNA helicase DDX5	69,10	5,00	2,00
Q9HBB1	Peptide deformylase, mitochondrial	27,00	5,00	4,00
P31689	DnaJ homolog subfamily A member 1	44,84	5,00	3,00
Q02413	Desmoglein-1	113,68	3,00	5,00
Q9UM11	Fizzy-related protein homolog (CDH1)	55,15	5,00	
P04406	Glyceraldehyde-3-phosphate dehydrogenase	36,03	5,00	2,00
P11021	78 kDa glucose-regulated protein	72,29	6,00	2,00
Q14654	Insulin receptor substrate 4	133,68	5,00	1,00
Q72794	Keratin, type II cytoskeletal 1b	61,86	6,00	9,00
Q43790	Keratin, type II cuticular Hb6	53,47	11,00	11,00
P27448	MAP/microtubule affinity-regulating kinase 3	84,44	5,00	5,00
Q96PY6	Serine/threonine-protein kinase Nek1	142,74	5,00	
Q96PK6	RNA-binding protein 14	69,45	5,00	1,00
Q6P1L8	39S ribosomal protein L14, mitochondrial	15,94	5,00	2,00
Q9H2P0	Activity-dependent neuroprotector homeobox protein	123,49	4,00	1,00
P51648	Fatty aldehyde dehydrogenase	54,81	4,00	
Q96DE5	Anaphase-promoting complex subunit 16	11,66	4,00	
P36542	ATP synthase subunit gamma, mitochondrial	32,98	3,00	2,00
Q96GD4	Aurora kinase B	39,29	4,00	1,00
P81605	Dermcidin	11,28	1,00	4,00
Q8NDZ4	Deleted in autism protein 1	49,45	4,00	
Q60884	DnaJ homolog subfamily A member 2	45,72	3,00	3,00
Q96EY1	DnaJ homolog subfamily A member 3, mitochondrial	52,46	4,00	1,00
Q8WVX9	Fatty acyl-CoA reductase 1	59,32	4,00	
P38646	Stress-70 protein, mitochondrial	73,63	3,00	3,00
P08238	Heat shock protein HSP 90-beta	83,21	5,00	1,00
Q15323	Keratin, type I cuticular Ha1	47,21	9,00	3,00
Q8N1N4	Keratin, type II cytoskeletal 78	56,83	5,00	6,00
O76011	Keratin, type I cuticular Ha4	49,39	5,00	4,00
P42167	Lamina-associated polypeptide 2, isoforms beta/gamma	50,64	4,00	
Q9Y383	Putative RNA-binding protein Luc7-like 2	46,49	4,00	1,00
Q02978	Mitochondrial 2-oxoglutarate/malate carrier protein	34,04	4,00	
Q969Z3	Mitochondrial amidoxime reducing component 2	38,00	4,00	
Q9BU61	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 3	20,34	3,00	3,00

Q15233	Non-POU domain-containing octamer-binding protein	54,20	2,00	4,00
Q9NX40	OCIA domain-containing protein 1	27,61	4,00	
P39656	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase 48 kDa subunit	50,77	4,00	4,00
Q9H7Z7	Prostaglandin E synthase 2	41,92	4,00	
Q86SQ0	Pleckstrin homology-like domain family B member 2	142,07	4,00	
Q8WUK0	Phosphatidylycerophosphatase and protein-tyrosine phosphatase 1	22,83	4,00	4,00
P61254	60S ribosomal protein L26	17,25	4,00	3,00
P63173	60S ribosomal protein L38	8,21	4,00	4,00
P04843	Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 1	68,53	4,00	1,00
P62277	40S ribosomal protein S13 O	17,21	4,00	2,00
P62249	40S ribosomal protein S16	16,44	4,00	
P62269	40S ribosomal protein S18	17,71	2,00	3,00
P39019	40S ribosomal protein S19	16,05	4,00	2,00
P62266	40S ribosomal protein S23	15,80	4,00	3,00
P42677	40S ribosomal protein S27	9,45	4,00	3,00
Q75396	Vesicle- trafficking protein SEC22b	24,58	4,00	
P21796	Voltage-dependent anion-selective channel protein 1	30,75	4,00	
P12956	X-ray repair cross-complementing protein 6	69,80	4,00	
Q9Y4W6	AFG3-like protein 2	88,53	3,00	
Q9NWB6	Arginine and glutamate-rich protein 1	33,20	3,00	
Q75964	ATP synthase subunit g, mitochondrial	11,42	3,00	
Q8WWM7	Ataxin-2-like protein	113,30	3,00	
Q86X55	Histone-arginine methyltransferase CARM1	65,81	3,00	
Q96BQ5	Coiled-coil domain-containing protein 127	30,82	3,00	
P06493	Cyclin-dependent kinase 1	34,07	3,00	1,00
Q9GZY4	Cytochrome c oxidase assembly factor 1 homolog	16,68	3,00	
P08574	Cytochrome c1, heme protein, mitochondrial	35,40		1,00
Q92499	ATP-dependent RNA helicase DDX1	82,38	3,00	
Q99615	DnaJ homolog subfamily C member 7	56,40	3,00	
Q60762	Dolichol-phosphate mannosyltransferase subunit 1	29,62	3,00	1,00
Q9Y295	Developmentally-regulated GTP-binding protein 1	40,52	1,00	3,00
Q9NVZ3	G2 and S phase-expressed protein 1	76,60	3,00	2,00
Q00839	Heterogeneous nuclear ribonucleoprotein U	90,53	3,00	1,00
Q9NZ18	Insulin-like growth factor 2 mRNA-binding protein 1	63,44	2,00	2,00
P13646	Keratin, type I cytoskeletal 13	49,56	6,00	10,00
Q04695	Keratin, type I cytoskeletal 17	48,08	10,00	10,00
P05787	Keratin, type II cytoskeletal 8	53,67	8,00	8,00
Q9BW19	Kinesin-like protein KIFC1	73,70	1,00	3,00
Q5T749	Keratinocyte proline-rich protein	64,09	1,00	3,00
Q81WC1	MAP7 domain-containing protein 3	98,37	3,00	
Q00325	Phosphate carrier protein, mitochondrial	40,07	3,00	1,00
Q9PJ0J	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13	16,69	3,00	1,00
Q9P032	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 4	20,25	2,00	3,00
Q75489	NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial	30,22	3,00	1,00
P19338	Nucleolin	76,57	3,00	
Q9UG56	Phosphatidylserine decarboxylase proenzyme, mitochondrial	46,64	3,00	
P14923	Junction plakoglobin	81,69	2,00	2,00
P61289	Proteasome activator complex subunit 3	29,49	3,00	
Q9HBH5	Retinol dehydrogenase 14	36,84	2,00	2,00
P26373	60S ribosomal protein L13	24,25	3,00	1,00
P83731	60S ribosomal protein L24	17,77	3,00	2,00
Q9NX20	39S ribosomal protein L16, mitochondrial	28,43	3,00	1,00
P62263	40S ribosomal protein S14	16,26	3,00	3,00
P60866	40S ribosomal protein S20	13,36	2,00	3,00
P62861	40S ribosomal protein S30	6,64	3,00	3,00
P46782	40S ribosomal protein S5	22,86	2,00	3,00
P62081	40S ribosomal protein S7	22,11	3,00	1,00
P14678	Small nuclear ribonucleoprotein-associated proteins B and B'	24,59	3,00	3,00
P08865	40S ribosomal protein SA	32,83	2,00	1,00
Q9BYN8	28S ribosomal protein S26, mitochondrial	24,20	3,00	
Q6P1M0	Long-chain fatty acid transport protein 4	72,02	3,00	
P60468	Protein transport protein Sec61 subunit beta	9,97	3,00	1,00
Q8NBX0	Saccharopine dehydrogenase-like oxidoreductase	47,12	3,00	2,00
Q13435	Splicing factor 3B subunit 2	100,16	3,00	3,00
Q15393	Splicing factor 3B subunit 3	135,49	2,00	2,00
Q9BQE3	Tubulin alpha-1C chain	49,86	3,00	2,00
P07437	Tubulin beta chain	49,64	8,00	4,00
Q9Y3D7	Mitochondrial import inner membrane translocase subunit TIM16	13,82	3,00	1,00
Q3ZCQ8	Mitochondrial import inner membrane translocase subunit TIM50	39,62	3,00	
Q15388	Mitochondrial import receptor subunit TOM20 homolog	16,29	3,00	1,00
Q961X5	Up-regulated during skeletal muscle growth protein 5	6,45	3,00	
P25311	Zinc-alpha-2-glycoprotein	34,24	3,00	1,00
P23246	Splicing factor, proline- and glutamine-rich	76,10		3,00
P78371	T-complex protein 1 subunit beta	57,45		3,00
P48643	T-complex protein 1 subunit epsilon	59,63		3,00
P05141	ADP/ATP translocase 2	32,83	9,00	7,00
P12236	ADP/ATP translocase 3	32,85	9,00	6,00
P05089	Arginase-1	34,71		1,00
P05023	Sodium/potassium-transporting ATPase subunit alpha-1	112,82	2,00	
P35613	Basigin	42,17	2,00	
Q00587	Cdc42 effector protein 1	40,27	2,00	1,00
Q43684	Mitotic checkpoint protein BUB3	37,13	2,00	
Q96L14	Cep170-like protein	32,63	2,00	
P31944	Caspase-14	27,66	2,00	1,00
P07339	Cathepsin D	44,52	2,00	1,00
Q8NHZ8	Anaphase-promoting complex subunit CDC26	9,77	2,00	
Q8N5K1	CDGSH iron-sulfur domain-containing protein 2	15,27	2,00	1,00
Q8WVK9	Cytoskeleton-associated protein 2	76,94	2,00	2,00
Q07065	Cytoskeleton-associated protein 4	65,98	2,00	
Q9Y224	UPF0568 protein C14orf166	28,05	2,00	1,00
Q9Y2R0	Cytochrome c oxidase assembly factor 3 homolog, mitochondrial	11,72	2,00	2,00
Q43809	Cleavage and polyadenylation specificity factor subunit 5	26,21	1,00	1,00
P00367	Glutamate dehydrogenase 1, mitochondrial	61,36	1,00	1,00
Q43143	Pre-mRNA-splicing factor ATP-dependent RNA helicase DHX15	90,88	1,00	1,00
Q9UBX3	Mitochondrial dicarboxylate carrier	31,26	2,00	
Q9NPF5	DNA methyltransferase 1-associated protein 1	52,96	2,00	
P25685	DnaJ homolog subfamily B member 1	38,02	2,00	
Q75190	DnaJ homolog subfamily B member 6	36,06	2,00	2,00
Q61AN0	Dehydrogenase/reductase SDR family member 7B	35,10	2,00	
Q95147	Dual specificity protein phosphatase 14	22,24	2,00	

P40939	Trifunctional enzyme subunit alpha, mitochondrial	82,95	2,00	
P26641	Elongation factor 1-gamma	50,09	2,00	
Q5D862	Filaggrin-2	247,93	1,00	2,00
Q14318	Peptidyl-prolyl cis-trans isomerase FKBP8	44,53	2,00	
Q9H936	Mitochondrial glutamate carrier 1	34,45	2,00	
Q8NBJ4	Golgi membrane protein 1	45,31	2,00	
P28799	Granulins	63,50	1,00	2,00
P62805	Histone H4	11,36	1,00	1,00
O00165	HCLS1-associated protein X-1	31,60	2,00	1,00
Q9UBN7	Histone deacetylase 6	131,34	2,00	
P04792	Heat shock protein beta-1	22,77	1,00	2,00
P01857	Ig gamma-1 chain C region	36,08	2,00	2,00
P05783	Keratin, type I cytoskeletal 18	48,03	2,00	3,00
P02538	Keratin, type II cytoskeletal 6A	60,01	16,00	22,00
P04259	Keratin, type II cytoskeletal 6B	60,03	17,00	21,00
P78386	Keratin, type II cuticular Hb5	55,77	9,00	7,00
P31025	Lipocalin-1	19,24	2,00	
Q96AG4	Leucine-rich repeat-containing protein 59	34,91	2,00	2,00
Q3MHD2	Protein LSM12 homolog	21,69	2,00	1,00
Q9H0U3	Magnesium transporter protein 1	38,01	2,00	
Q9B0G0	Myb-binding protein 1A	148,76	2,00	1,00
Q13257	Mitotic spindle assembly checkpoint protein MAD2A	23,50	2,00	
P55081	Microfibrillar-associated protein 1	51,93	2,00	
P60660	Myosin light polypeptide 6	16,92	2,00	
Q969V3	Nicalin	62,93	2,00	
O60361	Putative nucleoside diphosphate kinase	15,52	2,00	1,00
O00483	Cytochrome c oxidase subunit NDUFA4	9,36	2,00	2,00
Q16718	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5	13,45	2,00	
O95168	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4	15,20	2,00	2,00
Q9BPW8	Protein NlpSnap homolog 1	33,29	2,00	1,00
Q7Z417	Nuclear fragile X mental retardation-interacting protein 2	76,07	2,00	
Q9H6K4	Optic atrophy 3 protein	19,98	2,00	
Q99497	Protein deglycase DJ-1	19,88	1,00	2,00
O5EBL8	PDZ domain-containing protein 11	16,12	2,00	2,00
O00264	Membrane-associated progesterone receptor component 1	21,66	2,00	1,00
Q99959	Plakophilin-2	97,35	2,00	1,00
P29590	Protein PML	97,49	2,00	
P62937	Peptidyl-prolyl cis-trans isomerase A	18,00	2,00	1,00
Q06830	Peroxioredoxin-1	22,10	1,00	2,00
Q96011	Peroxisomal membrane protein 11B	28,41	2,00	
P07919	Cytochrome b-c1 complex subunit 6, mitochondrial	10,73	2,00	
O14949	Cytochrome b-c1 complex subunit 8	9,90	2,00	1,00
Q5XKPO	MICOS complex subunit MIC13	13,08	2,00	
P61026	Ras-related protein Rab-10	22,53	2,00	
P11233	Ras-related protein Ral-A	23,55	2,00	
P62491	Ras-related protein Rab-11A	24,38	2,00	
Q8IUD2	ELKS/Rab6-interacting/CAST family member 1	128,01	2,00	
O14498	RNA-binding protein 39	59,34	1,00	1,00
Q8IUW5	RELT-like protein 1	29,32	2,00	
P62913	60S ribosomal protein L11	20,24	2,00	
P62750	60S ribosomal protein L23a	17,68	2,00	2,00
P52815	39S ribosomal protein L12, mitochondrial	21,33	2,00	
Q9NRX2	39S ribosomal protein L17, mitochondrial	20,04	2,00	
P46783	40S ribosomal protein S10	18,89	2,00	2,00
P62244	40S ribosomal protein S15a	14,83	1,00	2,00
P62851	40S ribosomal protein S25	13,73	2,00	2,00
P62753	40S ribosomal protein S6	28,66	2,00	1,00
P46781	40S ribosomal protein S9	22,58	2,00	
Q7L412	Arginine/serine-rich coiled-coil protein 2	50,53	2,00	
Q86VD7	Mitochondrial coenzyme A transporter SLC25A42	35,39	2,00	
O75880	Protein SCO1 homolog, mitochondrial	33,79	2,00	1,00
Q43819	Protein SCO2 homolog, mitochondrial	29,79	1,00	2,00
Q75533	Splicing factor 3B subunit 1	145,74	2,00	
Q9H9B4	Sideroflexin-1	35,60	2,00	1,00
Q95470	Sphingosine-1-phosphate lyase 1	63,48	2,00	
P62316	Small nuclear ribonucleoprotein Sm D2	13,52	2,00	1,00
Q04837	Single-stranded DNA-binding protein, mitochondrial	17,25	1,00	1,00
P43307	Translocon-associated protein subunit alpha	32,22	2,00	
P51571	Translocon-associated protein subunit delta	18,99	2,00	
P40227	T-complex protein 1 subunit zeta	57,99	1,00	2,00
Q8WUY1	Protein THEM6	23,85	2,00	
Q9UM00	Calcium load-activated calcium channel	21,16	2,00	
P53007	Tricarboxylate transport protein, mitochondrial	33,99	2,00	1,00
Q95292	Vesicle-associated membrane protein-associated protein B/C	27,21	3,00	
Q99536	Synaptic vesicle membrane protein VAT-1 homolog	41,89	1,00	2,00
P45880	Voltage-dependent anion-selective channel protein 2	31,55	2,00	1,00
Q9UEU0	Vesicle transport through interaction with t-SNAREs homolog 1B	26,67	2,00	
Q96TA2	ATP-dependent zinc metalloprotease YME1L1	86,40	2,00	
Q9UBS4	DnaJ homolog subfamily B member 11	40,49		2,00
Q96F86	Enhancer of mRNA-decapping protein 3	56,04		2,00
P50991	T-complex protein 1 subunit delta	57,89		2,00
P56378	6.8 kDa mitochondrial proteolipid	6,66	1,00	
Q9NRG9	Aladin	59,54	1,00	
Q8N2K0	Monoacylglycerol lipase ABHD12	45,07	1,00	
Q9H845	Acy-CoA dehydrogenase family member 9, mitochondrial	68,72	1,00	
P04075	Fructose-bisphosphate aldolase A	39,40	1,00	
P04745	Alpha-amylase 1	57,73	1,00	
P07355	Annexin A2	38,58	1,00	
P05090	Apolipoprotein D	21,26	1,00	
Q6UXV4	MICOS complex subunit MIC27	29,14	1,00	
Q9NW81	ATP synthase subunit s-like protein	29,25	1,00	
O5T9A4	ATPase family AAA domain-containing protein 3B	72,53	15,00	6,00
O00244	Copper transport protein ATOX1	7,40	1,00	
Q9Y6H3	Mitochondrial inner membrane protease ATP23 homolog	28,06	1,00	
Q75947	ATP synthase subunit d, mitochondrial	18,48	1,00	1,00
P56385	ATP synthase subunit e, mitochondrial	7,93	1,00	1,00
P30049	ATP synthase subunit delta, mitochondrial	17,48	1,00	
Q94766	Galactosylgalactosylxylosylprotein 3-beta-glucuronosyltransferase 3	37,10	1,00	
P51572	B-cell receptor-associated protein 31	27,97	1,00	
Q60566	Mitotic checkpoint serine/threonine-protein kinase BUB1 beta	119,47	1,00	

Q13698	Voltage-dependent L-type calcium channel subunit alpha-1S	212,21		1,00
P27482	Calmodulin-like protein 3	16,88	1,00	
P47755	F-actin-capping protein subunit alpha-2	32,93	1,00	1,00
Q8WWC4	m-AAA protease-interacting protein 1, mitochondrial	32,52	1,00	
Q13185	Chromobox protein homolog 3	20,80	1,00	
Q6P152	Protein C3orf33	33,74	1,00	
P60953	Cell division control protein 42 homolog	21,25	1,00	
Q6P1J9	Parafibromin	60,54	1,00	
P41208	Centrin-2	19,73	1,00	
O15182	Centrin-3	19,54	1,00	
Q96HJ9	Protein FMC1 homolog	12,74	1,00	
Q9UFW8	CGG triplet repeat-binding protein 1	18,81	1,00	
P61604	10 kDa heat shock protein, mitochondrial	10,92	1,00	
Q96BP2	Coiled-coil-helix-coiled-coil-helix domain-containing protein 1	13,47	1,00	1,00
Q9BRQ6	MICOS complex subunit MIC25	26,44	1,00	
Q9NZ45	CDGSH iron-sulfur domain-containing protein 1	12,19	1,00	
POC7P0	CDGSH iron-sulfur domain-containing protein 3, mitochondrial	14,21	1,00	1,00
Q00610	Clathrin heavy chain 1	191,49	1,00	
Q86VU5	Catechol O-methyltransferase domain-containing protein 1	28,79	1,00	
Q9POS2	Cytochrome c oxidase assembly protein COX16 homolog, mitochondrial	12,29	1,00	
P00403	Cytochrome c oxidase subunit 2	25,55	1,00	1,00
P13073	Cytochrome c oxidase subunit 4 isoform 1, mitochondrial	19,56	1,00	1,00
Q9BSF4	Mitochondrial import inner membrane translocase subunit Tim29	29,22	1,00	
Q43822	Protein C21orf2	28,32	1,00	
Q9UK59	Lariat debranching enzyme	61,52	1,00	
P61962	DDB1- and CUL4-associated factor 7	38,90	1,00	1,00
Q8WWC6	Dephospho-CoA kinase domain-containing protein	26,53	1,00	
Q7L014	Probable ATP-dependent RNA helicase DDX46	117,29	1,00	
Q53GQ0	Very-long-chain 3-oxoacyl-CoA reductase	34,30	1,00	
P51659	Peroxisomal multifunctional enzyme type 2	79,64	1,00	1,00
Q9NXW2	DnaJ homolog subfamily B member 12	41,79	1,00	
O00148	ATP-dependent RNA helicase DDX39A	49,10	1,00	
P55084	Trifunctional enzyme subunit beta, mitochondrial	51,26	1,00	
P24534	Elongation factor 1-beta	24,75	1,00	
P50402	Emerin	28,98	1,00	
O94905	Erlin-2	37,82	1,00	
P30042	ES1 protein homolog, mitochondrial	28,15	1,00	
Q96A26	Protein FAM162A	17,33	1,00	
Q9JLW8	Mapk-regulated corepressor-interacting protein 1	10,91	1,00	
Q9UNN5	FAS-associated factor 1	73,91	1,00	1,00
Q6ZVX7	F-box only protein 50	30,83	1,00	1,00
P51114	Fragile X mental retardation syndrome-related protein 1	69,68	1,00	
Q8TAE8	Growth arrest and DNA damage-inducible proteins-interacting protein 1	25,37	1,00	
P16520	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-3	37,20	1,00	
Q9UB16	Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-12	8,00	1,00	
Q8TB36	Ganglioside-induced differentiation-associated protein 1	41,32	1,00	
O75223	Gamma-glutamylcyclotransferase	20,99	1,00	
Q8N428	Polypeptide N-acetylgalactosaminyltransferase 16	63,03	1,00	
P11488	Guanine nucleotide-binding protein G(I) subunit alpha-1	40,02	1,00	
POC055	Histone H2A.Z	13,54	1,00	
P22830	Ferrochelatase, mitochondrial	47,83	1,00	1,00
Q14103	Heterogeneous nuclear ribonucleoprotein D0	38,41	1,00	1,00
P07900	Heat shock protein HSP 90-alpha	84,61	2,00	
Q14197	Peptidyl-tRNA hydrolase ICT1, mitochondrial	23,62	1,00	
B9A064	Immunoglobulin lambda-like polypeptide 5	23,05	1,00	1,00
Q96152	Mitochondrial inner membrane protease subunit 2	19,71	1,00	
P12532	Creatine kinase U-type, mitochondrial	47,01	1,00	
Q14525	Keratin, type I cuticular Ha3-II	46,18	6,00	2,00
Q9UNZ5	Leydig cell tumor 10 kDa protein homolog	10,57		1,00
Q9GZ28	Extracellular glycoprotein lacritin	14,24	1,00	
P00338	L-lactate dehydrogenase A chain	36,67	1,00	1,00
P62310	U6 snRNA-associated Sm-like protein LSM3	11,84	1,00	
Q9UNF1	Melanoma-associated antigen D2	64,91	1,00	
Q8NE86	Calcium uniporter protein, mitochondrial	39,84	1,00	
Q86XN8	RNA-binding protein MEX3D	64,84	1,00	1,00
P14174	Macrophage migration inhibitory factor	12,47	1,00	1,00
Q8IX12	Mitochondrial Rho GTPase 1	70,74	1,00	
Q15773	Myeloid leukemia factor 2	28,13	1,00	
Q15014	Mortality factor 4-like protein 2	32,29	1,00	
P13995	Bifunctional methylenetetrahydrofolate dehydrogenase/cyclohydrolase, mitochondrial	37,87	1,00	
Q8TB22	MYCBP-associated protein	108,09	1,00	1,00
Q99417	C-Myc-binding protein	11,96	1,00	
Q9GZM8	Nuclear distribution protein nudE-like 1	38,35	1,00	
P56556	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6	17,86	1,00	
P51970	NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8	20,09	1,00	
Q9NX14	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial	17,31		1,00
E9PQ53	NADH dehydrogenase [ubiquinone] 1 subunit C2, isoform 2	13,40	1,00	1,00
Q330K2	NADH dehydrogenase (ubiquinone) complex I, assembly factor 6	38,15	1,00	
Q75251	NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial	23,55	1,00	
Q8N9A8	Nuclear envelope phosphatase-regulatory subunit 1	14,26	1,00	
Q75323	Protein NipSnap homolog 2	33,72	1,00	1,00
Q9BSD7	Cancer-related nucleoside-triphosphatase	20,70	1,00	
Q9BX56	Nucleolar and spindle-associated protein 1	49,42	1,00	1,00
Q15070	Mitochondrial inner membrane protein OXA1L	48,52	1,00	
P32322	Pyroline-5-carboxylate reductase 1, mitochondrial	33,34	1,00	
Q15365	Poly(rC)-binding protein 1	37,47	1,00	1,00
Q15366	Poly(rC)-binding protein 2	38,56	2,00	
Q16342	Programmed cell death protein 2	38,57	1,00	
Q15173	Membrane-associated progesterone receptor component 2	23,80	1,00	
Q969N2	GPI transamidase component FIG-T	65,66	1,00	
Q9HAU0	Pleckstrin homology domain-containing family A member 5	127,38	1,00	
Q9Y3C6	Peptidyl-prolyl cis-trans isomerase-like 1	18,23	1,00	
P28072	Proteasome subunit beta type-6	25,34	1,00	
Q8WXF1	Paraspeckle component 1	58,71	1,00	1,00
PODJ07	Protein PET100 homolog, mitochondrial	9,11	1,00	
Q9NR77	Peroxisomal membrane protein 2	22,24	1,00	
P51149	Ras-related protein Rab-7a	23,47	1,00	
Q5HY18	Rab-like protein 3	26,41	1,00	
Q8IY67	Ribonucleoprotein PTB-binding 1	63,84	1,00	
Q5R372	Rab GTPase-activating protein 1-like	92,45		1,00

P49756	RNA-binding protein 25	100,12	1,00	1,00
P08134	Rho-related GTP-binding protein RhoC	21,99	1,00	
P30050	60S ribosomal protein L12	17,81	1,00	1,00
P18621	60S ribosomal protein L17	21,38	1,00	1,00
Q6P5R6	60S ribosomal protein L22-like 1	14,60	1,00	
P35268	60S ribosomal protein L22	14,78	1,00	1,00
P46776	60S ribosomal protein L27a	16,55	1,00	1,00
P61353	60S ribosomal protein L27	15,79	1,00	
P46779	60S ribosomal protein L28	15,74	1,00	
P62899	60S ribosomal protein L31	14,45	1,00	1,00
P49207	60S ribosomal protein L34	13,28	1,00	
P83881	60S ribosomal protein L36a	12,43	1,00	1,00
P62891	60S ribosomal protein L39	6,40	1,00	1,00
P62917	60S ribosomal protein L8	28,01	1,00	
P32969	60S ribosomal protein L9	21,85	1,00	
Q96EL3	39S ribosomal protein L53, mitochondrial	12,10		1,00
Q96E39	RNA binding motif protein, X-linked-like-1	42,12	1,00	
P09651	Heterogeneous nuclear ribonucleoprotein A1	38,72	1,00	
P22626	Heterogeneous nuclear ribonucleoproteins A2/B1	37,41	1,00	
Q14684	Ribosomal RNA processing protein 1 homolog B	84,38	1,00	
P62841	40S ribosomal protein S15	17,03	1,00	
P08708	40S ribosomal protein S17	15,54	1,00	1,00
P62854	40S ribosomal protein S26	13,01	1,00	1,00
P15880	40S ribosomal protein S2	31,30	1,00	
Q9Y2R9	28S ribosomal protein S7, mitochondrial	28,12	1,00	
O15235	28S ribosomal protein S12, mitochondrial	15,16	1,00	
O60783	28S ribosomal protein S14, mitochondrial	15,13		1,00
P08621	U1 small nuclear ribonucleoprotein 70 kDa	51,53	1,00	
P08579	U2 small nuclear ribonucleoprotein B"	25,47	1,00	
Q9Y230	RuvB-like 2	51,12	1,00	
A8MWD9	Putative small nuclear ribonucleoprotein G-like protein 15	8,54	1,00	1,00
P05109	Protein S100-A8	10,83	1,00	
Q9Y512	Sorting and assembly machinery component 50 homolog	51,94	1,00	
O15459	Splicing factor 3A subunit 1	88,83	1,00	1,00
O75556	Mammaglobin-B	10,88	1,00	
Q9GZT3	SRA stem-loop-interacting RNA-binding protein, mitochondrial	12,34	1,00	
P62314	Small nuclear ribonucleoprotein Sm D1	13,27	1,00	
O8WV10	Small integral membrane protein 4	8,69	1,00	1,00
Q96KF7	Small integral membrane protein 8	11,05	1,00	
Q13425	Beta-2-syntrophin	57,91	1,00	
Q13573	SNW domain-containing protein 1	61,46	1,00	1,00
P0CG40	Transcription factor Sp9	48,88	1,00	
Q96P63	Serpin B12	46,25	1,00	1,00
Q96125	Splicing factor 45	44,93	1,00	
P35321	Cornifin-A	9,87	1,00	
O15269	Serine palmitoyltransferase 1	52,71	1,00	1,00
Q9Y6N5	Sulfide:quinone oxidoreductase, mitochondrial	49,93	1,00	
Q05519	Serine/arginine-rich splicing factor 11	53,51	1,00	1,00
Q9UNL2	Translocon-associated protein subunit gamma	21,07	1,00	
Q95793	Double-stranded RNA-binding protein Staufen homolog 1	63,14	1,00	
Q9UJZ1	Stomatin-like protein 2, mitochondrial	38,51	1,00	
P07814	Bifunctional glutamate/proline--tRNA ligase	170,48	1,00	
Q9P2J5	Leucine--tRNA ligase, cytoplasmic	134,38	1,00	1,00
Q9H061	Transmembrane protein 126A	21,51	1,00	
P68371	Tubulin beta-4B chain	49,80	5,00	3,00
P23258	Tubulin gamma-1 chain	51,14	1,00	1,00
P17987	T-complex protein 1 subunit alpha	60,31	1,00	1,00
P49368	T-complex protein 1 subunit gamma	60,50	1,00	
Q08188	Protein-glutamine gamma-glutamyltransferase E	76,58	1,00	
O86V81	THO complex subunit 4	26,87	1,00	1,00
Q13263	Transcription intermediary factor 1-beta	88,49	1,00	
P62072	Mitochondrial import inner membrane translocase subunit Tim10	10,33	1,00	
Q9BVC6	Transmembrane protein 109	26,19	1,00	1,00
A0PJW6	Transmembrane protein 223	22,03	1,00	
P57088	Transmembrane protein 33	27,96	1,00	
Q9UPN9	E3 ubiquitin-protein ligase TRIM33	122,46	1,00	1,00
Q01081	Splicing factor U2AF 35 kDa subunit	27,85		1,00
P0CG48	Polyubiquitin-C	76,99	1,00	
Q9P0L0	Vesicle-associated membrane protein-associated protein A	27,88	2,00	
Q5T750	Skin-specific protein 32	26,22	1,00	
P13010	X-ray repair cross-complementing protein 5	82,65	1,00	
Q9H0D6	5'-3' exonuclease 2	108,51	1,00	1,00
Q95619	YEATS domain-containing protein 4	26,48	1,00	
Q96DA0	Zymogen granule protein 16 homolog B	22,72	1,00	
Q6PML9	Zinc transporter 9	63,47	1,00	
Q96BW9	Phosphatidate cytidyltransferase, mitochondrial	51,03	1,00	
Q8N5G0	Small integral membrane protein 20	7,70	1,00	1,00
Q9HDC9	Adipocyte plasma membrane-associated protein	46,45		1,00
P11586	C-1-tetrahydrofolate synthase, cytoplasmic	101,50		1,00
O8N684	Cleavage and polyadenylation specificity factor subunit 7	52,02	1,00	1,00
P26196	Probable ATP-dependent RNA helicase DDX6	54,38		1,00
Q96HP0	Dedicator of cytokinesis protein 6	229,41		1,00
Q03164	Histone-lysine N-methyltransferase 2A	431,50		1,00
O60476	Mannosyl-oligosaccharide 1,2-alpha-mannosidase IB	72,96		1,00
P33992	DNA replication licensing factor MCM5	82,23		1,00
P40926	Malate dehydrogenase, mitochondrial	35,48		1,00
Q13765	Nascent polypeptide-associated complex subunit alpha	23,37		1,00
Q9Y6V0	Protein piccolo	552,94		1,00
P40937	Replication factor C subunit 5	38,47		1,00
P61513	60S ribosomal protein L37a	10,27		1,00
P19474	E3 ubiquitin-protein ligase TRIM21	54,14		1,00
Q96EE3	Nucleoporin SEH1	39,62		1,00
Q8TF72	Protein Shroom3	216,72		1,00
Q99832	T-complex protein 1 subunit eta	59,33		1,00
Q9H6K5	Proline-rich protein 36	132,67		1,00

Table S2. Proteomic analysis of co-IP with Atox1 antibody as bait using MDA-MB-231 cells

In bold are proteins identified in co-IP with anti-Atox1 monoclonal antibody but not in co-IP with monoclonal IgG isotype antibody as bait (i.e., hits). APC subunits underlined. See Materials for details.

Accession/Uniprot	Description: protein name (alternative name)	MW [kDa]	#Peptides Atox1 Ab co-IP	#Peptides Control Ab co-IP
Q15149	Plectin	531,47	43	38
P35908	Keratin, type II cytoskeletal 2 epidermal	65,39	33	25
P04264	Keratin, type II cytoskeletal 1	66,00	31	27
P13645	Keratin, type I cytoskeletal 10	58,79	28	23
P02538	Keratin, type II cytoskeletal 6A	60,01	28	20
P04259	Keratin, type II cytoskeletal 6B	60,03	27	19
P02533	Keratin, type I cytoskeletal 14	51,53	25	18
P13647	Keratin, type II cytoskeletal 5	62,34	25	21
P08779	Keratin, type I cytoskeletal 16	51,24	24	19
P05787	Keratin, type II cytoskeletal 8	53,67	22	21
Q04695	Keratin, type I cytoskeletal 17	48,08	21	17
O43790	Keratin, type II cuticular Hb6	53,47	21	17
P78385	Keratin, type II cuticular Hb3	54,16	19	14
P15924	Desmoplakin	331,57	18	23
P35527	Keratin, type I cytoskeletal 9	62,03	18	17
P08729	Keratin, type II cytoskeletal 7	51,35	18	15
P08727	Keratin, type I cytoskeletal 19	44,08	17	18
P78386	Keratin, type II cuticular Hb5	55,77	16	15
Q9UJX3	Anaphase-promoting complex subunit 7	66,81	14	
P08670	Vimentin	53,62	14	11
Q15323	Keratin, type I cuticular Ha1	47,21	12	13
P05783	Keratin, type I cytoskeletal 18	48,03	11	10
Q14525	Keratin, type I cuticular Ha3-II	46,18	11	12
P30260	Cell division cycle protein 27 homolog (ANAPC3)	91,81	10	
Q01546	Keratin, type II cytoskeletal 2 oral	65,80	10	8
O76011	Keratin, type I cuticular Ha4	49,39	10	9
P23246	Splicing factor, proline- and glutamine-rich	76,10	10	11
P07437	Tubulin beta chain	49,64	10	3
P68104	Elongation factor 1-alpha 1	50,11	9	4
P13646	Keratin, type I cytoskeletal 13	49,56	9	12
Q7Z794	Keratin, type II cytoskeletal 1b	61,86	9	6
P62269	40S ribosomal protein S18	17,71	9	8
P68371	Tubulin beta-4B chain	49,80	9	3
P11142	Heat shock cognate 71 kDa protein	70,85	8	5
P11940	Polyadenylate-binding protein 1	70,63	8	6
P23396	40S ribosomal protein S3	26,67	8	5
Q02413	Desmoglein-1	113,68	7	4
Q14764	Major vault protein	99,27	7	4
Q8WWW7	Ataxin-2-like protein	113,30	6	
Q14CN4	Keratin, type II cytoskeletal 72	55,84	6	4
Q8N1N4	Keratin, type II cytoskeletal 78	56,83	6	5
Q9NSB2	Keratin, type II cuticular Hb4	64,80	6	5
P60709	Actin, cytoplasmic 1	41,71	5	7
P05141	ADP/ATP translocase 2	32,83	5	2
P12236	ADP/ATP translocase 3	32,85	5	1
Q9UJX4	Anaphase-promoting complex subunit 5	85,02	5	
Q13283	Ras GTPase-activating protein-binding protein 1	52,13	5	4
P28799	Granulins	63,50	5	2
Q6KB66	Keratin, type II cytoskeletal 80	50,49	5	
Q15233	Non-POU domain-containing octamer-binding protein	54,20	5	4
Q13310	Polyadenylate-binding protein 4	70,74	5	2
P14923	Junction plakoglobin	81,69	5	3
Q9UHX1	Poly(U)-binding-splicing factor PUF60	59,84	5	4
Q96PK6	RNA-binding protein 14	69,45	5	6
P62263	40S ribosomal protein S14	16,26	5	3
P62249	40S ribosomal protein S16	16,44	5	4
Q13042	Cell division cycle protein 16 homolog (ANAPC6)	71,61	4	
P17844	Probable ATP-dependent RNA helicase DDX5	69,10	4	3
P11021	78 kDa glucose-regulated protein	72,29	4	2
P52272	Heterogeneous nuclear ribonucleoprotein M	77,46	4	1
P01876	Ig alpha-1 chain C region	37,63	4	1
P35579	Myosin-9	226,39	4	9
P22626	Heterogeneous nuclear ribonucleoproteins A2/B1	37,41	4	2
P62701	40S ribosomal protein S4, X isoform	29,58	4	1
P82979	SAP domain-containing ribonucleoprotein	23,66	4	
Q8TF42	Ubiquitin-associated and SH3 domain-containing protein B	72,65	4	3
P63267	Actin, gamma-enteric smooth muscle	41,85	3	6
P07355	Annexin A2	38,58	3	3
Q9NWB6	Arginine and glutamate-rich protein 1	33,20	3	2
Q14444	Caprin-1	78,32	3	3
Q9UJX2	Cell division cycle protein 23 homolog (ANAPC8)	68,79	3	
P81605	Dermcidin	11,28	3	3
Q9UN86	Ras GTPase-activating protein-binding protein 2	54,09	3	2
P04406	Glyceraldehyde-3-phosphate dehydrogenase	36,03	3	3
P38646	Stress-70 protein, mitochondrial	73,63	3	
P04792	Heat shock protein beta-1	22,77	3	2
O76013	Keratin, type I cuticular Ha6	52,21	3	3
P02545	Prelamin-A/C	74,09	3	
Q00325	Phosphate carrier protein, mitochondrial	40,07	3	1
Q7Z417	Nuclear fragile X mental retardation-interacting protein 2	76,07	3	
P62280	40S ribosomal protein S11	18,42	3	3
P39019	40S ribosomal protein S19	16,05	3	3
P67809	Nuclease-sensitive element-binding protein 1	35,90	3	2
Q9Y305	Acyl-coenzyme A thioesterase 9, mitochondrial	49,87	2	
P02768	Serum albumin	69,32	2	
Q9H1A4	Anaphase-promoting complex subunit 1	216,36	2	

O00244	Copper transport protein ATOX1	7,40	2	
O43684	Mitotic checkpoint protein BUB3	37,13	2	1
P31944	Caspase-14	27,66	2	2
P04040	Catalase	59,72	2	1
P07339	Cathepsin D	44,52	2	1
O9UBS4	DnaJ homolog subfamily B member 11	40,49	2	2
O75190	DnaJ homolog subfamily B member 6	36,06	2	1
O5D862	Filaggrin-2	247,93	2	2
O75223	Gamma-glutamylcyclotransferase	20,99	2	
Q96QA5	Gasdermin-A	49,33	2	1
O8WUF5	RelA-associated inhibitor	89,04	2	5
P01857	Ig gamma-1 chain C region	36,08	2	2
P42167	Lamina-associated polypeptide 2, isoforms beta/gamma	50,64	2	
P31025	Lipocalin-1	19,24	2	
P47929	Galectin-7	15,07	2	2
Q8WW11	LIM domain only protein 7	192,58	2	2
Q3MHD2	Protein LSM12 homolog	21,69	2	
P61626	Lysozyme C	16,53	2	2
O95168	NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4	15,20	2	
P06748	Nucleophosmin	32,55	2	1
Q9BSD7	Cancer-related nucleoside-triphosphatase	20,70	2	1
Q15366	Poly(rC)-binding protein 2	38,56	2	
Q99623	Prohibitin-2	33,28	2	2
P22061	Protein-L-isoaspartate(D-aspartate) O-methyltransferase	24,62	2	1
Q99959	Plakophilin-2	97,35	2	1
P32119	Peroxisiredoxin-2	21,88	2	1
P35268	60S ribosomal protein L22	14,78	2	2
P62750	60S ribosomal protein L23a	17,68	2	2
P62829	60S ribosomal protein L23	14,86	2	2
P09651	Heterogeneous nuclear ribonucleoprotein A1	38,72	2	2
P46783	40S ribosomal protein S10	18,89	2	2
P62277	40S ribosomal protein S13	17,21	2	2
P62244	40S ribosomal protein S15a	14,83	2	2
P08708	40S ribosomal protein S17	15,54	2	
P60866	40S ribosomal protein S20	13,36	2	
P62851	40S ribosomal protein S25	13,73	2	3
P46782	40S ribosomal protein S5	22,86	2	3
Q9Y310	tRNA-splicing ligase RtcB homolog	55,17	2	
P06703	Protein S100-A6	10,17	2	1
P05109	Protein S100-A8	10,83	2	1
Q96P63	Serpin B12	46,25	2	1
Q9Y6N5	Sulfide:quinone oxidoreductase, mitochondrial	49,93	2	1
P37108	Signal recognition particle 14 kDa protein	14,56	2	2
Q9BQE3	Tubulin alpha-1C chain	49,86	2	2
P22735	Protein-glutamine gamma-glutamyltransferase K	89,73	2	
P25311	Zinc-alpha-2-glycoprotein	34,24	2	2
E9PRG8	Uncharacterized protein C11orf98	13,79	2	
Q9UJX6	Anaphase-promoting complex subunit 2	93,77	1	
Q9UM13	Anaphase-promoting complex subunit 10	21,24	1	
Q96DE5	Anaphase-promoting complex subunit 16	11,66	1	
Q9UJX5	Anaphase-promoting complex subunit 4	92,06	1	
P18085	ADP-ribosylation factor 4	20,50	1	
P05089	Arginase-1	34,71	1	1
P56385	ATP synthase subunit e, mitochondrial	7,93	1	1
Q8NHZ8	Anaphase-promoting complex subunit CDC26	9,77	1	
P06493	Cyclin-dependent kinase 1	34,07	1	
Q15517	Corneodesmosin	51,49	1	
Q9NX63	MICOS complex subunit MIC19	26,14	1	
Q9Y224	UPF0568 protein C14orf166	28,05	1	1
P27658	Collagen alpha-1(VIII) chain	73,32	1	1
P21291	Cysteine and glycine-rich protein 1	20,55	1	
O00622	Protein CYR61	42,00	1	
P01040	Cystatin-A	11,00	1	1
Q15828	Cystatin-M	16,50	1	
O15523	ATP-dependent RNA helicase DDX3Y	73,11	1	1
P31689	DnaJ homolog subfamily A member 1	44,84	1	
O60884	DnaJ homolog subfamily A member 2	45,72	1	1
O60762	Dolichol-phosphate mannosyltransferase subunit 1	29,62	1	1
Q08554	Desmocollin-1	99,92	1	
P29692	Elongation factor 1-delta	31,10	1	
P26641	Elongation factor 1-gamma	50,09	1	
P49411	Elongation factor Tu, mitochondrial	49,51	1	
P06733	Alpha-enolase	47,14	1	
Q62VX7	F-box only protein 50	30,83	1	1
P35637	RNA-binding protein FUS	53,39	1	2
P51114	Fragile X mental retardation syndrome-related protein 1	69,68	1	
P22492	Histone H1t	22,01	1	1
P0C055	Histone H2A.Z	13,54	1	1
O60814	Histone H2B type 1-K	13,88	1	2
P62805	Histone H4	11,36	1	2
Q14103	Heterogeneous nuclear ribonucleoprotein D0	38,41	1	1
P61978	Heterogeneous nuclear ribonucleoprotein K	50,94	1	
O60506	Heterogeneous nuclear ribonucleoprotein Q	69,56	1	
P05198	Eukaryotic translation initiation factor 2 subunit 1	36,09	1	1
P06730	Eukaryotic translation initiation factor 4E	25,08	1	
P01591	Immunoglobulin J chain	18,09	1	
B9A064	Immunoglobulin lambda-like polypeptide 5	23,05	1	
Q5T749	Keratinocyte proline-rich protein	64,09	1	
P14618	Pyruvate kinase PKM	57,90	1	

Q9Y383	Putative RNA-binding protein Luc7-like 2	46,49	1	
Q96AG4	Leucine-rich repeat-containing protein 59	34,91	1	1
P26038	Moesin	67,78	1	2
Q06830	Peroxisredoxin-1	22,10	1	1
P60900	Proteasome subunit alpha type-6	27,38	1	
P28072	Proteasome subunit beta type-6	25,34	1	
P22695	Cytochrome b-c1 complex subunit 2, mitochondrial	48,41	1	
O14949	Cytochrome b-c1 complex subunit 8	9,90	1	1
O00391	Sulfhydryl oxidase 1	82,53	1	
Q81Y67	Ribonucleoprotein PTB-binding 1	63,84	1	1
P49756	RNA-binding protein 25	100,12	1	
P29558	RNA-binding motif, single-stranded-interacting protein 1	44,48	1	
P62913	60S ribosomal protein L11	20,24	1	1
P30050	60S ribosomal protein L12	17,81	1	1
P26373	60S ribosomal protein L13	24,25	1	
P61254	60S ribosomal protein L26	17,25	1	
P62888	60S ribosomal protein L30	12,78	1	
P62899	60S ribosomal protein L31	14,45	1	2
P42766	60S ribosomal protein L35	14,54	1	1
P61513	60S ribosomal protein L37a	10,27	1	1
P63173	60S ribosomal protein L38	8,21	1	
Q6P1L8	39S ribosomal protein L14, mitochondrial	15,94	1	
P62841	40S ribosomal protein S15	17,03	1	1
P62266	40S ribosomal protein S23	15,80	1	
P42677	40S ribosomal protein S27	9,45	1	
P62857	40S ribosomal protein S28	7,84	1	1
P62273	40S ribosomal protein S29	6,67	1	1
P15880	40S ribosomal protein S2	31,30	1	1
P62861	40S ribosomal protein S30	6,64	1	1
P62753	40S ribosomal protein S6	28,66	1	
P08865	40S ribosomal protein SA	32,83	1	
P08579	U2 small nuclear ribonucleoprotein B''	25,47	1	
P31151	Protein S100-A7	11,46	1	1
Q9HCY8	Protein S100-A14	11,65	1	
Q9UHR5	SAP30-binding protein	33,85	1	
P17900	Ganglioside GM2 activator	20,82	1	
Q6UWP8	Suprabasin	60,50	1	
Q6NUK1	Calcium-binding mitochondrial carrier protein SCaMC-1	53,32	1	
Q99470	Stromal cell-derived factor 2	23,01	1	1
Q15637	Splicing factor 1	68,29	1	
Q13435	Splicing factor 3B subunit 2	100,16	1	
O75556	Mammaglobin-B	10,88	1	1
Q8TF72	Protein Shroom3	216,72	1	1
P35321	Corniflin-A	9,87	1	1
Q04837	Single-stranded DNA-binding protein, mitochondrial	17,25	1	
Q95793	Double-stranded RNA-binding protein Staufen homolog 1	63,14	1	2
Q08188	Protein-glutamine gamma-glutamyltransferase E	76,58	1	1
P10599	Thioredoxin	11,73	1	1
Q9Y3D7	Mitochondrial import inner membrane translocase subunit TIM14	13,82	1	
Q12931	Heat shock protein 75 kDa, mitochondrial	80,06	1	
Q01081	Splicing factor U2AF 35 kDa subunit	27,85	1	
Q8WWV7	WAP four-disulfide core domain protein 12	12,04	1	
A4UGR9	Xin actin-binding repeat-containing protein 2	382,06	1	1
A0A096LP55	Cytochrome b-c1 complex subunit 6-like, mitochondrial	10,74	1	
Q9BWM7	Sideroflexin-3	35,48	1	
O43809	Cleavage and polyadenylation specificity factor subunit 5	26,21		1
O43854	EGF-like repeat and discoidin I-like domain-containing protein 3	53,73		1
P62081	40S ribosomal protein S7	22,11		2
P0CG48	Polyubiquitin-C	76,99		1
Q01844	RNA-binding protein EWS	68,44		1
Q01469	Fatty acid-binding protein, epidermal	15,15		1
P68431	Histone H3.1	15,39		1
P17096	High mobility group protein HMG-I/HMG-Y	11,67		2
Q86YZ3	Hornerin	282,23		1
Q92615	La-related protein 4B	80,50		5
P55081	Microfibrillar-associated protein 1	51,93		1
Q96DR8	Mucin-like protein 1	9,03		1
P12882	Myosin-1	223,01		12
Q9UKX2	Myosin-2	222,91		12
P22531	Small proline-rich protein 2E	7,85		1
P67936	Tropomyosin alpha-4 chain	28,50		1