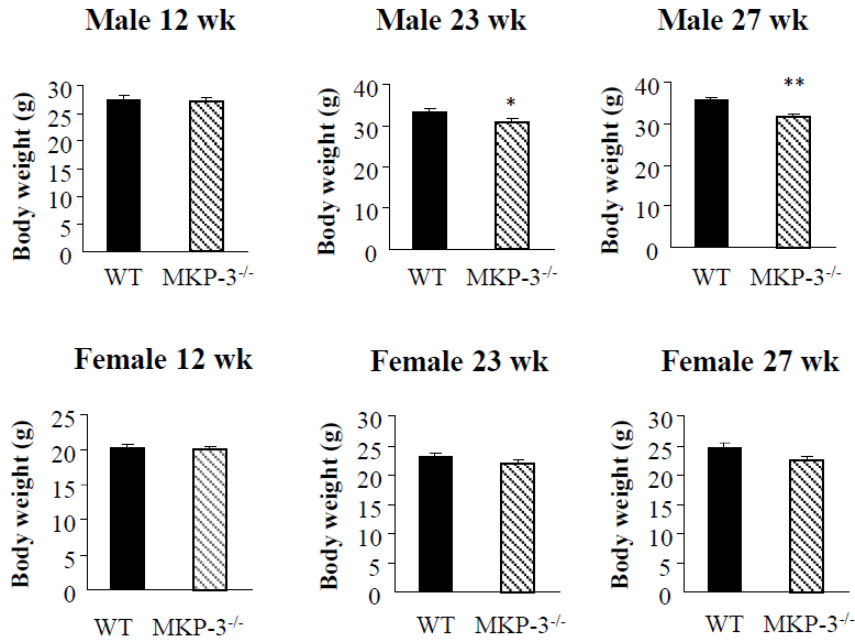


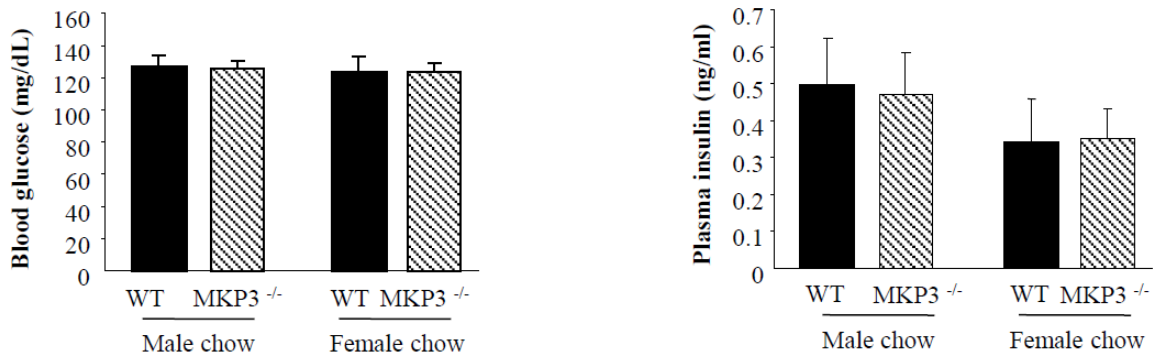
SUPPLEMENTARY DATA

Supplementary Figure 1.

**A**



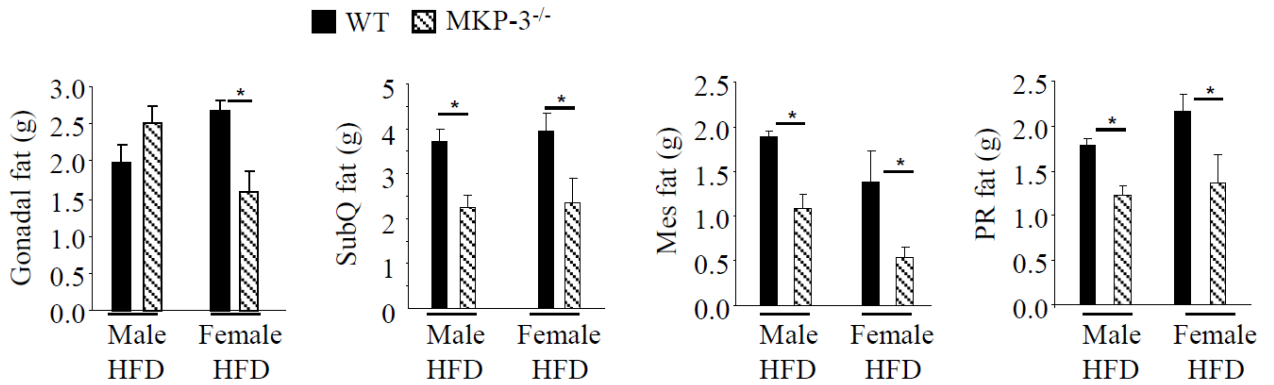
**B**



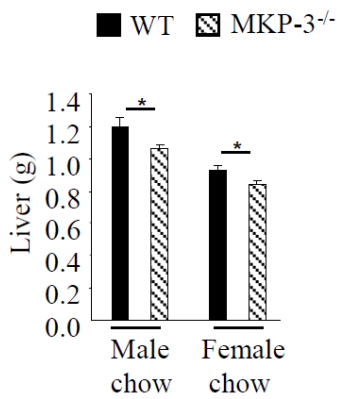
SUPPLEMENTARY DATA

Supplementary Figure 2.

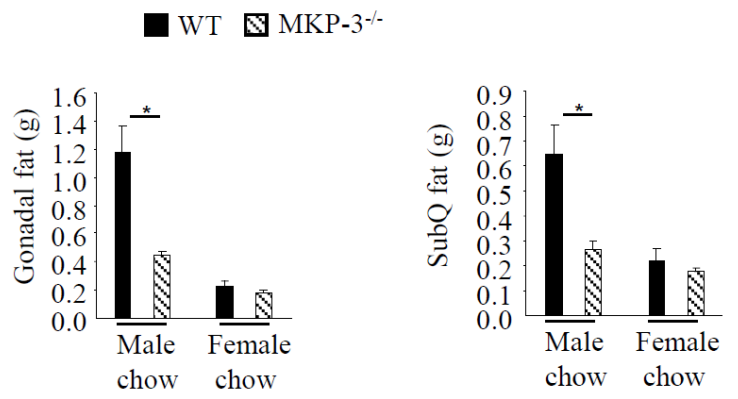
A.



B.



C.



SUPPLEMENTARY DATA

**Supplementary Table 1.** Fold increase of Ser/Thr/Tyr phosphorylation in livers of MKP-3<sup>-/-</sup> male mice versus wild type male mice fed on a high fat diet (n=5 for each group).

Symbol	Name	Phosphorylation sites	KO/WT ratio	Q Value
<b>Apoptosis</b>				
ACIN1	Acin1 protein	S64 T66	11.4 8.3	0.02 0.02
API5	Apoptosis inhibitor 5	S461 S462	2.2 1.8	0.03 0.03
AIFM3	Apoptosis-inducing factor 3	S30	7.4	0.03
TP53BP2	Apoptosis-stimulating of p53 protein 2	S479	3.7	0.02
ACIN1	Apoptotic chromatin condensation inducer 1	S64S70 S208 S210 S479S482S491 S729	5.7 7.1 7.0 105.7 2.8	0.02 0.02 0.02 0.03 0.02
PEA15	Astrocytic phosphoprotein PEA-15	S116	10.8	0.02
BAG3	BAG family molecular chaperone regulator 3	S179 S353S357 S360 S390	3.3 2.3 2.3 8.4	0.02 0.03 0.03 0.02
BNIP2	BCL2/adenovirus E1B 19 kDa-interacting protein 2 alpha	S114	3.9	0.02
BNIP3	BCL2/adenovirus E1B 19 kDa protein-interacting protein 3	S60 S85T86 S88	19.8 14.5 6.1	0.03 0.02 0.02
BCL2L13	Bcl-2-like protein 13	S387 T389	4.0 3.1	0.02 0.02
CAAP1	Caspase activity and apoptosis inhibitor	S183	2.3	0.03
CARD6	Card6 caspase recruitment domain family, member 6	S809	3.6	0.03
CASP8	Caspase-8	S188	2.2	0.02
DAP	Death-associated protein	S51	5.4	0.02
DAPK2	Death-associated protein kinase 2	S299 S349	3.8 3.5	0.02 0.02
FAF1	FAS-associated factor 1	S269	17.1	0.04
GAS2	Growth arrest-specific protein 2	T282 S283 S287 S289	5.3 7.4 5.3 7.4	0.02 0.02 0.02 0.02
GCH1	GTP cyclohydrolase 1	S24	3.9	0.02
HTT	Huntingtin	S398S409S411	9.7	0.02
KRT18	Keratin, type I cytoskeletal 18	T9 S31S32S35 S43S45	2.7 2.8 3.1	0.02 0.02 0.02
PDCD5	MCG128907	S119 Y126	10.7 4.0	0.02 0.02
BNIP3I	MCG2480, isoform CRA_b	S61S62 S63S64	12.9 8.1	0.03 0.02

SUPPLEMENTARY DATA

RMDN3	regulator of microtubule dynamics protein 3 isoform X1	S44 S46 S50	2.8 4.2 2.8	0.02 0.02 0.02
SERBP1	Plasminogen activator inhibitor 1 RNA-binding protein	S197 S243	12.9 11.1	0.02 0.02
PLEKHB2	Pleckstrin homology-like domain family B member 2	S411 S465	4.7 3.8	0.03 0.03
PDCD4	Programmed cell death protein 4	S76 T93 S457	2.8 7.8 4.2	0.02 0.02 0.02
RRAGC	Ras-related GTP-binding protein C	S381	6.1	0.02
EBAG9	Receptor-binding cancer antigen expressed on SiSo cells	S36	11.0	0.02
RMDN3	Regulator of microtubule dynamics protein 3	S212	1.7	0.03
SGPP1	Sphingosine-1-phosphate phosphatase 1	S101	9.9	0.02
UACA	Uaca protein	S240	13.5	0.02
<b>Autophagy</b>				
ATG9a	Autophagy 9-like 1 protein	S735	7.1	0.02
UFL1	E3 UFM1-protein ligase 1	S458 S462	10.2 213.8	0.02 0.02
ZSWIM8	Zinc finger SWIM domain-containing protein KIAA0913	S48	10.3	0.03
<b>Carbohydrate metabolism</b>				
ATAD1	ATPase family AAA domain-containing protein 1	S319	6.5	0.02
PGLS	6-Phosphogluconolactonase	S46 S49	49.0 34.0	0.02 0.02
CA5A	Carbonic anhydrase 5A, mitochondrial	S32	4.9	0.02
ENGASE	Cytosolic endo-beta-N-acetylglucosaminidase	S16	5.2	0.04
ENO1	Enolase alpha	S351	2.7	0.02
FBA1	Fructose-bisphosphate aldolase	S36 T39 S161 T227T235T241	3.5 2.5 1.7 2.5	0.02 0.02 0.03 0.02
GCGR	Glucagon receptor	S433 S436	17.0 18.0	0.02 0.02
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	S149T151 S208	3.5 2.4	0.02 0.02
GYS2	Glycogen [starch] synthase, liver	S8T10S11 T626 S627	5.7 8.7 7.2	0.02 0.02 0.02
GYS1	Glycogen [starch] synthase, muscle	S653S657	5.3	0.02
GSK3B	Glycogen synthase kinase 3 beta	Y216	4.3	0.02
GSK3A	Glycogen synthase kinase-3 alpha	T19 S21	1.8 1.7	0.03 0.03
PGAM1	MCG113582	S14	3.0	0.02
PPP1R2	MCG126099, isoform CRA_b	S122S123	3.9	0.02
TOMM70A	Mitochondrial import receptor subunit TOM70	S94S99 S105 S108S113	9.8 3.1 4.8	0.02 0.02 0.02
PGM3	Phosphoacetylglucosamine mutase	S64	3.5	0.02
PGM2	Phosphoglucomutase 2	S135	9.0	0.02

SUPPLEMENTARY DATA

		T171	4.2	0.02
STBD1	Stbd1 protein	S161	8.4	0.02
TPI1	Triosephosphate isomerase	Y127S130	3.6	0.02
UGDH	UDP-glucose 6-dehydrogenase	T474	2.1	0.03
SLC35A3	UDP-N-acetylglucosamine transporter isoform X1	S115	15.0	0.02
<b>Cell adhesion and extracellular matrix</b>				
AF6	Afadin	S1173	3.2	0.02
		S1182	3.9	0.02
		S1275	5.4	0.02
FN1	Anastellin	S280	6.6	0.02
		S283	6.2	0.02
		S2475	3.0	0.02
ARVCF	Armadillo repeat protein deleted in velo-cardio-facial syndrome homolog	S269	1.9	0.03
		S345	7.9	0.03
CDHR5	Cadherin-related family member 5	S753	5.3	0.02
CTNNA1	Catenin alpha-1	S641	5.9	0.02
		S652T654S655	6.2	0.02
		T658	6.4	0.02
CD44	CD44 antigen	S612	2.4	0.03
CEACAM1	CEA-related cell adhesion molecule 1	T462S469	2.0	0.02
CGN	Cingulin	S89S90	2.3	0.02
		S114	2.2	0.03
		S131S134	3.5	0.02
		S445	4.7	0.02
CLDN5	Claudin-5	T207	1.9	0.02
EZR	Ezrin	Y565	3.4	0.02
GP1BB	Glycoprotein Ib, beta polypeptide	S194	3.9	0.02
PPFIBP1	Liprin-beta-1	S435	4.1	0.02
PPFIBP2	Liprin-beta-2	S518	1.9	0.02
LMO7	Lmo7 protein	S255	5.0	0.02
		S453	2.5	0.03
		S904S906	3.3	0.02
		S993	3.6	0.02
		S1069	5.1	0.02
2410018M08RI K	MCG130675	S45	3.6	0.02
CLDN3	MCG16699	T203	9.8	0.02
MFAP1	Microfibrillar-associated protein 1	S116S118	15.5	0.02
OCLN	Occludin	Y367	21.2	0.02
PPHLN1	Periplin-1	S219	3.8	0.02
PVR	Poliovirus receptor	S381	5.1	0.02
PCDH1	Protocadherin 1	S962	20.0	0.02
STAB2	Stabilin-2	S2503	6.5	0.02
SYMPK	Symplekin	S1271	3.1	0.02
		S1272	3.3	0.02
		S2040	3.3	0.02
TLN1	Talin-1	S2040	3.3	0.02
TROAP	Tastin	T159T160	3.3	0.02
TJP1	Tight junction protein ZO-1	S125Y132	3.3	0.02
		S175S178S179	2.6	0.02
		S617	4.2	0.02
		S622	5.0	0.02
		S912	4.4	0.02
TJP2	Tight junction protein ZO-2	S107	3.4	0.02

SUPPLEMENTARY DATA

		S213	1.6	0.03
		S404	2.6	0.02
		S968	2.3	0.02
		S1133	2.2	0.02
TLN2	Tln2 talin-2	T1844	3.4	0.02
TNS1	Tns1 tensin 1	S792	10.6	0.02
		S899	8.7	0.02
		S1062	4.6	0.02
		S1346	2.0	0.02
		T1357	4.4	0.02
		S1363	5.2	0.02
		S1375	1.7	0.02
		S1397	5.2	0.02
		S1399	2.5	0.02
		S1423	3.7	0.02
		S1451	3.7	0.02
		S1468S1470	4.3	0.02
		S1535T1537	5.8	0.02
TFIP11	Tuftelin-interacting protein 11	S96S99	18.5	0.02
VCL	Vinculin	S290	5.9	0.02
		S346	4.3	0.02
<b>Cell cycle</b>				
ABI1	Abl-interactor 1	S225	19	0.02
		T229S231	6.6	0.02
AHSG	Alpha-2-HS-glycoprotein	T130	6.6	0.02
		S134	6.6	0.02
		S138	10.9	0.02
		S309S312S314	5.0	0.02
ARMC10	Armadillo repeat-containing protein 10	S43	7.2	0.02
BRAP	BRCA1-associated protein	S116	58.5	0.02
CALU	Calumenin	S69	3.8	0.02
CD2BP2	CD2 antigen cytoplasmic tail-binding protein 2	S196	1.5	0.04
CDKN2AIP	CDKN2A-interacting protein	S168	3.0	0.03
CETN2	Centrin-2	S20	1.8	0.04
CENPA	Centromere protein A, isoform CRA_c	S15	3.4	0.02
CGNL1	Cingulin-like 1	T250	1.7	0.03
		S284	2.3	0.02
CLASP1	CLIP-associating protein 1	S600	15.3	0.02
		T650	10.8	0.02
CRIP2	Crip2 protein	S114	6.0	0.02
	Cutaneous T-cell lymphoma-associated antigen 5 homolog	S533	5.2	0.02
		S540	7.7	0.02
		S628	4.0	0.02
CDK9	Cyclin-dependent kinase 9	S347	6.1	0.02
CDK11	Cyclin-dependent kinase 11	S47	5.1	0.03
CDK12	Cyclin-dependent kinase 12	Y888T889	6.6	0.02
CDK13	Cyclin-dependent kinase 13	S341S343S349	6.5	0.02
		Y862	4.7	0.02
		Y870T871	4.4	0.02
		T1143S1146	5.5	0.03
CDKN1B	Cyclin-dependent kinase inhibitor 1B	S7S10	4.2	0.02

SUPPLEMENTARY DATA

CCNK	Cyclin-K	S341	19.4	0.02
CCNL1	Cyclin-L1	S358	6.0	0.03
		S380	8.9	0.03
CCNL2	Cyclin-L2	S328	13.2	0.02
		S345	3.8	0.02
CCNY	Cyclin-Y	S326	5.7	0.02
SPECC1L	Cytospin-A	S833	4.6	0.02
MEPCE	7SK snRNA methylphosphate capping enzyme	S126	2.8	0.02
		T188S192	6.8	0.02
DPH1	Diphthamide biosynthesis protein 1	S418	2.0	0.03
DLG1	Disks large homolog 1	S534	10.5	0.02
		S537S538S540	9.5	0.02
		S542	4.5	0.02
		T651	3.9	0.02
		S655	9.7	0.02
DNM1L	Dynammin-1-like protein	S532	7.0	0.02
DNCLH1	Dynein cytoplasmic 1 light intermediate chain 1	S516	3.5	0.02
UHRF2	E3 ubiquitin-protein ligase UHRF2	S668	4.5	0.02
GNL3	Guanine nucleotide-binding protein-like 3	S505	3.8	0.02
LIGL2	Lethal(2) giant larvae protein homolog 2	S1046	8.0	0.02
PCNP	MCG130899	T139T141	5.0	0.02
GPS1	MCG2137, isoform CRA_b	S509	4.7	0.02
		S518S520	7.5	0.02
NPM1	MCG68069	S125	1.8	0.03
MTUS1	Microtubule-associated tumor suppressor 1 homolog	S1208	3.3	0.02
NBR1	Nbr1 protein	T659	3.3	0.02
NIPBL	Nipped-B-like protein	S2652	8.6	0.02
HMGN1	Non-histone chromosomal protein HMG-14	T71T80	4.5	0.02
		S84	2.8	0.02
		S87	4.5	0.02
ZC3HC1	Nuclear-interacting partner of ALK	S295	6.1	0.02
		S364	7.2	0.02
NUMA1	Numa1 Nuclear mitotic apparatus protein 1	S1739	4.3	0.02
		S1835	4.6	0.02
		S1974	1.5	0.02
		T1982	3.6	0.03
PARD3	Pard3 protein	S383	4.0	0.02
PWP1	Periodic tryptophan protein 1 homolog	S486S491S493	6.0	0.02
PINX1	PIN2/TERF1-interacting telomerase inhibitor 1	T228S233	4.3	0.02
RRP15	RRP15-like protein	S265	3.6	0.02
SASH1	SAM and SH3 domain-containing protein 1	S831	3.4	0.02
SEPT2	Septin-2	S218	5.0	0.02
SEPT7	Septin-7	T425	3.2	0.02
SEPT9	Septin 9	S64	8.6	0.02
SIPA1	Signal-induced proliferation-associated protein 1	S72	4.7	0.03
PDS5B	Sister chromatid cohesion protein PDS5 homolog B	S1160S1165S1166	18.5	0.02
		6		
		S1356	10.1	0.02
		S1360	9.3	0.02
		S1381	7.6	0.02

SUPPLEMENTARY DATA

SPHK2	Sphingosine kinase 2	S364	7.2	0.02
WAPAL	Wings apart-like protein homolog	S77	3.3	0.02
		S226	6.7	0.02
ZZEF1	Zinc finger ZZ-type and EF-hand domain-containing protein 1	S1538	6.5	0.02
ZWINT	ZW10 interactor	S216	6.9	0.02
<b>Cytoskeleton</b>				
ABLIM1	Actin-binding LIM protein 1	S475	2.2	0.02
		S496	2.8	0.02
ABLIM3	Actin-binding LIM protein 3	S373	2.9	0.02
		S502S503	3.3	0.02
SVIL	Archvillin	S857	2.5	0.03
		S960	3.3	0.02
RCSD1	CapZ-interacting protein	S177S179	3.4	0.02
CDC42EP1	Cdc42 effector protein 1	S205S207	1.7	0.03
		S121	8.9	0.02
CDC42EB4	Cdc42 effector protein 4	S64	5.1	0.02
DMTN	Dematin	S226	2.3	0.02
DSP	Desmoplakin	S2219S2221	4.9	0.02
		T2607	3.6	0.02
		S2620	11.9	0.02
EPPK1	Epiplakin	S1537	2.7	0.02
		S2705	5.9	0.02
		S2707	4.3	0.02
FNBP1	Formin binding protein 1	S296S299	2.0	0.02
FNBP2	Formin-like protein 2	S171	8.0	0.02
GPHN	Gephyrin	S327S328	5.9	0.02
		S336S338	5.8	0.02
CASK	Isoform 3 of Peripheral plasma membrane protein CASK	S569	7.8	0.02
		S570S571	7.0	0.02
KRT8	Keratin, type II cytoskeletal 8	S24	3.5	0.02
		S482S484S489	3.7	0.02
KIF13B	Kif13b kinesin family member 13B	S1380	5.7	0.02
		S1390S1395	5.2	0.02
		S1409	6.5	0.02
		S1414	4.3	0.02
		T1653	5.5	0.02
		S1654	5.6	0.02
		S1705	3.5	0.02
		S1794	4.4	0.03
		S1795	3.0	0.03
		S1812	5.7	0.02
		S1814	5.0	0.02
KIF1B	Kinesin family member 1B	T1406	6.9	0.02
KLC4	Kinesin light chain 4	S590	2.4	0.03
KIF1C	Kinesin-like protein KIF1C	S674S676	3.5	0.02
KIF21A	Kinesin-like protein KIF21A	S1241	3.0	0.02
KIF7	Kinesin-like protein KIF7	S1078	8.5	0.02
LIMA1	LIM domain and actin-binding protein 1	T12	3.3	0.02
		S488	7.1	0.02
		S735	4.1	0.02
MPP5	MAGUK p55 subfamily member 5	S83	1.6	0.02
MAP7D1	MAP7 domain-containing protein 1	S401	10.7	0.03



SUPPLEMENTARY DATA

MAP1	Microtubule-associated protein	S517	3.2	0.02
		S761T762	3.1	0.02
		T745S748	3.5	0.02
MAP1S	Microtubule-associated protein 1S	S462	2.9	0.02
PALLD	Palladin	S1141S1143S1146	5.0	0.02
		S901	4.5	0.03
PALMD	Palmdelphin	T318T320	5.4	0.02
		S370S372	4.3	0.02
		S375	8.6	0.02
		S384S385	2.8	0.02
PXN	Paxillin	Y118	3.2	0.02
		S137	13.1	0.03
		S321	13.3	0.02
PLEC	Plectin	S4392	2.6	0.02
		S4393	2.4	0.02
EPB41	Protein 4.1	S552	5.3	0.02
		S541S543	4.8	0.02
		S678	35.9	0.03
SHROOM1	Protein Shroom1	S188	3.2	0.02
		S224	12.4	0.02
ROCK2	Rho-associated protein kinase 2	S1374	5.5	0.02
SLAIN2	SLAIN motif-containing protein 2	S392	1.8	0.03
GW7_15253	Spectrin beta chain, brain 1	S2102	2.3	0.02
		S2159	2.1	0.02
		S2163S2164S2168	4.8	0.02
		S2339	2.8	0.02
		S2340	2.2	0.02
CTTN	Src substrate cortactin	S113	3.4	0.02
TJP3	Tight junction protein 3	S103	4.5	0.02
		S106S111	4.2	0.02
		S343	3.5	0.02
		S366	3.7	0.02
TPPP	Tubulin polymerization-promoting protein	T15S19	4.7	0.02
VASP	Vasodilator-stimulated phosphoprotein	S235	5.9	0.02
FAM21	WASH complex subunit FAM21	S388	4.5	0.02
		S747	3.6	0.02
<b>DNA repair and modification</b>				
ALKBH3	Alpha-ketoglutarate-dependent dioxygenase alkB homolog 3	T24	1.6	0.03
		S28	2.2	0.02
ANKRD17	Ankyrin repeat domain-containing protein 17	S2055	3.7	0.02
APEX1	Apurinic/apyrimidinic endonuclease 1	S18	7.5	0.02
WRNIP1	ATPase WRNIP1	S151	6.2	0.02
		S153	5.7	0.02
MSH6	DNA mismatch repair protein Msh6	S62	5.2	0.02
XPC	DNA repair protein complementing XP-C cells homolog	S93	6.6	0.02
		S395S397	8.4	0.02
		S382	6.4	0.02
SFR1	DNA repair protein Sfr1	S51T54	3.7	0.02
		S99	23.1	0.02
TOP2B	DNA topoisomerase 2-beta	S1453	9.9	0.02
		S1537S1539	11.7	0.02

SUPPLEMENTARY DATA

RNF168	E3 ubiquitin-protein ligase RNF168	T501	4.3	0.02
GEN1	Flap endonuclease GEN homolog 1	T462	5.3	0.02
	Junction-mediating and –regulatory protein	S58	1.6	0.03
NHEJ1	Non-homologous end-joining factor 1	S243	3.6	0.03
		S245	7.7	0.02
DEK	Protein DEK	S33	2.7	0.02
RAD23A	Rad23a protein	S123S128	2.4	0.02
RECQL5	RecQ helicase protein-like 5 beta	S489S492	13.5	0.03
RNF169	Rnf169 ring finger protein 169	S279	3.6	0.02
ZC3HAV1	Zinc finger CCCH-type antiviral protein 1	S324	3.7	0.02
<b>DNA replication</b>				
MCM2	DNA replication licensing factor MCM2	S40	2.4	0.03
POLM	Polymerase (DNA directed), mu	S467	3.3	0.02
RER1	Protein RER1	S95	7.0	0.02
RNASEH1	Ribonuclease H1	S74S80	2.2	0.03
<b>Development</b>				
EPB41L5	Band 4.1-like protein 5	T387	8.2	0.02
SNTB1	Beta-1-syntrophin	T73	5.4	0.02
		S86	4.0	0.02
		S218	3.3	0.02
BIN1	Bin1 protein	S267S273	2.0	0.02
C2CD2	C2cd2 C2 calcium-dependent domain containing 2	S649	8.4	0.02
IBTK	Inhibitor of Bruton tyrosine kinase	S1046	4.7	0.02
DLG1	Isoform 2 of Disks large homolog 1	S665	6.6	0.02
		T672	3.3	0.02
DLG1	Isoform 3 of Disks large homolog 1	S671	2.0	0.03
IMNA	Lamin A	S17S18	2.6	0.02
		S22	2.7	0.02
		S390S392T394	2.6	0.03
LUZP1	Leucine zipper protein 1	S395	2.2	0.03
		S660	2.6	0.02
LSR	Lipolysis-stimulated lipoprotein receptor	S307	6.3	0.02
		S308	6.5	0.02
		S436	1.9	0.03
		S473Y478	5.1	0.02
		S588S591	2.9	0.02
MATR3	Matrin 3	S188	3.1	0.02
		S598S604	3.8	0.02
		S619	6.0	0.02
		S630	36.1	0.03
MOB1A	Mps one binder kinase activator-like 1A	T35	6.6	0.02
NUCKS1	Nuclear ubiquitous casein and cyclin-dependent kinases substrate	S19	4.9	0.02
		S50	5.5	0.02
		S54S58S61	18.6	0.02
		S73S75S79	8.9	0.02
		S181	5.6	0.02
		S214	5.0	0.02
PDLIM4	PDZ and LIM domain 4	S118S119	4.8	0.02
PDLIM5	PDZ and LIM domain protein 5	S228	1.9	0.03
		S308	4.0	0.02
PHACTR4	Phosphatase and actin regulator 4	S117	3.9	0.02
	Plakophilin 2	S102	3.4	0.02
		S131	3.0	0.02

SUPPLEMENTARY DATA

		S132S135	9.5	0.02
		S151S154	5.8	0.02
PLEKHA7	Pleckstrin homology domain-containing family A member 7	S481S482	5.1	0.02
COBL	Protein cordon-bleu	S1103	5.7	0.02
FAM83H	Protein FAM83H	S522	4.1	0.02
		S639	2.0	0.03
		S871	4.1	0.02
		S904	3.9	0.02
		S915	4.6	0.02
		S926	5.3	0.02
		S948	3.3	0.02
		S1041	3.2	0.02
		T1042	3.5	0.02
LNP	Protein lunapark	S411	21.5	0.02
NUMB	Protein numb homolog	S636	2.9	0.02
TGM1	Protein-glutamine gamma-glutamyltransferase K	S91S94	7.1	0.02
SHROOM2	SHROOM2	S443	12.1	0.03
		S957S959S960S962T963	2.3	0.02
SNTB2	Sntb2 protein	S88	6.2	0.02
		S90	4.7	0.02
SPAG9	Sperm associated antigen 9 (Fragment)	S366	3.1	0.02
		S368S369	4.6	0.02
UTRN	Utrn utrophin	S933	3.6	0.02
WDTC1	WD and tetratricopeptide repeats 1	S511	3.0	0.03
WDR33	Wdr33 WD repeat domain 33 isoform 1	S1204	4.4	0.02
<b>Heme biosynthesis</b>				
ALAD	Delta-aminolevulinic acid dehydratase	S214	2.5	0.03
<b>Immune response</b>				
CLMN	Calmin	S317	4.3	0.02
CFH	Complement factor H	Y1195	2.5	0.03
		S1196S1198	3.6	0.03
CRRY	Complement regulatory protein Crry	Y450	8.8	0.02
		S454	6.8	0.02
		S483	8.0	0.02
DBNL	Drebrin-like protein	S277	2.0	0.03
		T278	2.9	0.02
EDC3	Enhancer of mRNA-decapping protein 3	S131	1.7	0.02
FYB	FYN binding protein	S27S30	2.6	0.02
GNL1	Guanine nucleotide-binding protein-like 1	T48S51S55	6.9	0.02
HCK	Hemopoietic cell kinase	Y388	5.7	0.02
PSMD11	MCG19050, isoform CRA_d	S14	3.4	0.02
IFIH1	Melanoma differentiation-associated protein 5	T286	4.6	0.02
		S645S648	2.5	0.02
HMHA1	Minor histocompatibility protein HA-1	S577	4.8	0.02
MAVS	mitochondrial antiviral-signaling protein isoform 1	S152	13.9	0.02
SERPING1	Plasma protease C1 inhibitor	S41	2.0	0.03
<b>Lipid metabolism</b>				
ACC1	Acetyl-CoA carboxylase 1	S23S29	3.3	0.02
		S76	3.1	0.02

SUPPLEMENTARY DATA

		S79	2.8	0.02
ACC2	Acetyl-Coenzyme A carboxylase beta	S1332	2.3	0.03
ACSS2	Acetyl-Coenzyme A synthetase, cytoplasmic	S30	3.9	0.02
		S263	3.0	0.02
		S267	1.9	0.02
ACOT1	Acyl-coenzyme A thioesterase 1	S327S333	2.7	0.03
ACOT5	Acyl-coenzyme A thioesterase 5	S56	2.1	0.03
ACSM5	Acyl-coenzyme A synthetase 5, mitochondrial	S210	12.5	0.03
APOE	Apolipoprotein E	S319	2.2	0.02
ACLY	ATP citrate lyase	S455	3.9	0.02
		S478S481	11.7	0.02
PCYT1A	Choline-phosphate cytidyltransferase A	S319	6.8	0.02
		S321	5.2	0.02
		S322	6.8	0.02
		T342	1.8	0.03
		S343	1.8	0.03
ELOVL5	Elongation of very long chain fatty acids protein 5	S273T281	8.2	0.02
		S283*	13.8	0.02
PCYT2	Ethanolamine-phosphate cytidyltransferase	S10	5.4	0.02
		S163	2.4	0.03
FABP1	Fatty acid-binding protein, liver	S11	4.0	0.02
GPAT1	Glycerol-3-phosphate acyltransferase 1, mitochondrial	S687S694	83.4	0.02
GPAT3	Glycerol-3-phosphate acyltransferase 3	S66S68	4.0	0.02
HSL	Hormone-sensitive lipase	S559	2.9	0.02
HACD3	3-hydroxyacyl-CoA dehydratase 3	S114	6.1	0.02
PPAP2A	Lipid phosphate phosphohydrolase 1	S273	14.2	0.02
PPAP2B	Lipid phosphate phosphohydrolase 3	S19	4.6	0.02
MSR1	Macrophage scavenger receptor types I and II	S22S23	2.0	0.02
MCAT	Malonyl-CoA-acyl carrier protein transacylase, mitochondrial	S40	4.1	0.02
ZDHC5	Membrane-associated DHHC5 zinc finger protein	S380T385	6.8	0.02
PANK2	Pantothenate kinase 2 (Hallervorden-Spatz syndrome)	S42	11.7	0.02
PLIN5	Perilipin-5	S264T268	2.2	0.03
CDSA	Phosphatidate cytidyltransferase	S20	6.8	0.02
		S22	12.5	0.02
		T30	10.0	0.02
		S32	4.9	0.02
LPIN2	Phosphatidate phosphatase LPIN2	S186S187	3.9	0.02
		S245	3.0	0.02
PTGES3	Prostaglandin E synthase 3	S113	3.2	0.02
PDXDC1	Pyridoxal-dependent decarboxylase domain-containing protein 1	S30	2.1	0.02
PPP6R2	SAPS domain family, member 2, isoform CRA_a	S617	12.5	0.03
		S669	2.3	0.03
SERINC1	Serine incorporator 1	S364	2.7	0.02
PPP4R3A	Serine/threonine-protein phosphatase 4 regulatory subunit 3A	S728	72.7	0.02
HDLBP	Vigilin	S31	3.9	0.02
<b>Membrane trafficking</b>				

SUPPLEMENTARY DATA

AP1M1	AP-1 complex subunit mu-1	T152	8.7	0.02
		T154	8.6	0.02
CLINT1	Clathrin interactor 1	S227S232	3.5	0.03
DENNB5B	DENN domain-containing protein 5B	T1062S1068	25.8	0.03
EPN1	Epsin-1	T415	3.1	0.03
		S416	17.2	0.01
		S419	16.3	0.01
EPN2	Epsin 2	S192	3.3	0.03
		S195Y196	5.2	0.02
GOLGA3	Golgin subfamily A member 3	S60	2.6	0.02
		S277	2.1	0.02
SYTL2	Isoform 2 of Synaptotagmin-like protein 2	S685	3.4	0.03
TMPO	Lamina-associated polypeptide 2, isoforms alpha/zeta	S155	7.0	0.03
		S158T159	6.4	0.02
TMPO	Lamina-associated polypeptide 2, isoforms beta/delta/epsilon/gamma	S176Y182	12.5	0.02
		S183	9.0	0.02
		MCG8317	S1076	6.3
		S1566	7.2	0.02
NSFL1C	NSFL1 cofactor p47	S176	4.9	0.02
OPTN	Optineurin	S187	3.0	0.02
CASK	Peripheral plasma membrane protein CASK	S577	3.4	0.02
		S582	6.9	0.02
PICALM	Phosphatidylinositol-binding clathrin assembly protein	T301	25.1	0.02
LRP1	Prolow-density lipoprotein receptor-related protein 1	S4521	3.6	0.02
		S4524T4525	3.7	0.02
TPR	Protein Tpr	S2141	4.9	0.02
		S2223	3.4	0.02
SH3BP19	SH3 domain-containing protein 19	S366	10.1	0.02
SRP72	Srp72 signal recognition particle 72	S620	4.5	0.02
		S621S625S630	2.8	0.02
TXLNA	Taxilin alpha	S515	4.0	0.02
SSR3	Translocon-associated protein subunit gamma	S105	104.4	0.04
VAMP4	Vesicle-associated membrane protein 4	S30	8.2	0.02
WDR44	WD repeat domain 44	S50	3.2	0.02
ZFYVE19	Zinc finger FYVE domain-containing protein 19	S280	3.6	0.02
<b>Muscle contraction</b>				
MPRIP	Myosin phosphatase Rho interacting protein (Fragment)	S173	2.8	0.02
		S175	1.6	0.02
MYLK	Myosin, light polypeptide kinase	S342	5.3	0.02
		S362S364	2.2	0.03
		S386	4.5	0.02
MYH9	Myosin-9	T1939S1943	8.2	0.02
MYH11	Myosin-11	T1951S1954	2.9	0.02
MYO9B	Myosin-IXb	S1264	3.6	0.02
MYO6	Myosin-VI	T406	4.2	0.02
MYO18A	Myosin-XVIIIa	S72	6.0	0.02
		S1994S1998	9.0	0.02
		S2003S2016	2.5	0.02
		Y2035S2037S2039	5.1	0.02
<b>Oxidation and reduction</b>				

SUPPLEMENTARY DATA

ASPH	Aspartate-beta-hydroxylase	S14	6.6	0.03
CATALASE	Catalase	Y161 S166	2.9 2.6	0.02 0.03
COIL	Coilin	S146	9.1	0.02
CCS	Copper chaperone for superoxide dismutase	S267	1.8	0.03
CYP3A13	CYP3A13	S501	21.5	0.02
HACL1	2-Hydroxyacyl-CoA lyase 1	S4 S6 S18	4.0 4.0 4.2	0.02 0.03 0.03
HAAO	3-Hydroxyanthranilate 3,4-dioxygenase	S9	4.4	0.02
HPD	4-Hydroxyphenylpyruvate dioxygenase	S250	2.8	0.03
BCKDHA	2-Oxoisovalerate dehydrogenase subunit alpha, mitochondrial	S334 T335 S336 S344Y350	1.8 2.0 2.1 3.6	0.03 0.03 0.03 0.02
MTHFD1	C-1-tetrahydrofolate synthase, cytoplasmic	S549	6.6	0.02
DNYD	Dihydropyrimidine dehydrogenase [NADP+]	S905	5.6	0.02
FAM63A	Fam63a protein	S103 S440	6.2 2.7	0.02 0.02
GLRX5	Glutaredoxin-related protein 5, mitochondrial	S151	2.9	0.02
GSTP1	Glutathione S-transferase P 1	S195 S196	21.3 24.4	0.02 0.02
HGD	Homogentisate 1,2-dioxygenase	S438 S440	10.2 9.4	0.02 0.02
HADH	Hydroxyacyl-coenzyme A dehydrogenase, mitochondrial	S13	2.6	0.03
PRDX6	Peroxiredoxin-6	T192	3.5	0.03
FAM73B	Protein FAM73B	T273 S276	5.9 4.8	0.02 0.02
IWS1	Protein IWS1 homolog	S295 S321 S458S460	18.5 2.3 3.1	0.01 0.02 0.02
KIAA0284	Protein KIAA0284	S1122 S1166	1.6 1.8	0.03 0.03
PDHA1	Pyruvate dehydrogenase E1 alpha 1	T231 S293S295S300	2.9 3.3	0.02 0.02
NDUFV3	RIKEN cDNA 1500032D16, isoform CRA_a	T149S155 S161S163 S165	7.6 7.1 5.7	0.02 0.02 0.02
TDO2	Tryptophan 2,3-dioxygenase	S19	7.2	0.02
<b>Protein and amino acid metabolism</b>				
APEH	Acylamino-acid-releasing enzyme	S185	5.7	0.02
PSMD1	Proteasome 26S subunit, non-ATPase regulatory subunit 1	T311S315	5.6	0.02
BHMT	Betaine—homocysteine S-methyltransferase 1	S330 S333	9.6 13.8	0.02 0.02

SUPPLEMENTARY DATA

OASA	Cysteine synthase	S33	1.7	0.03
DCAF8	DDB1- and CUL4-associated factor 8	S100	2.6	0.02
DIS3L2	DIS3-like exonuclease 2	S864	14.6	0.02
STT3B	Dolichyl-diphosphooligosaccharide— protein glycosyltransferase subunit STT3B	S495S496	9.7	0.02
DTD1	D-tyrosyl-tRNA(Tyr) deacylase 1	S204S205	3.4	0.02
HECTD1	E3 ubiquitin-protein ligase HECTD1	S632	4.7	0.02
		S1383	10.3	0.03
		S1575	5.4	0.02
HUWE1	E3 ubiquitin-protein ligase HUWE1	S1395	8.4	0.02
		T1579	1.7	0.03
		S1903	6.8	0.02
		T1905	4.9	0.02
MGRN1	E3 ubiquitin-protein ligase MGRN1	S428	5.1	0.02
NEDD4	E3 ubiquitin-protein ligase NEDD4	T287	3.2	0.02
		S309	6.1	0.02
NEDD4L	E3 ubiquitin-protein ligase NEDD4-like	S477S478	7.7	0.02
UBR3	E3 ubiquitin-protein ligase UBR3	S1055	5.8	0.02
UBR4	E3 ubiquitin-protein ligase UBR4	T2721	8.3	0.02
ZNRF2	E3 ubiquitin-protein ligase ZNRF2	Y17S18S20	2.5	0.02
EML4	Echinoderm microtubule-associated protein-like 4	S144S146	3.6	0.02
NMT1	Glycylpeptide N-tetradecanoyltransferase 1	S15	3.7	0.02
		S31	4.3	0.02
		S47	3.6	0.02
NMT2	Glycylpeptide N-tetradecanoyltransferase 2	S38	1.8	0.03
HAL	Histidine ammonia-lyase	S631	7.8	0.02
		S635	16.2	0.02
		T637	10.8	0.02
		S643	7.4	0.02
LARP1	La-related protein 1	S68S81	7.6	0.02
		S188	10.4	0.03
		T196	17.0	0.02
		S198S201	21.3	0.03
		T297S302	6.7	0.02
		Y488T492	52.2	0.02
		S494	34.0	0.02
		S498	52.2	0.02
		T503	7.6	0.02
		S525	33.8	0.02
		S743	3.9	0.02
		T747S751	4.3	0.02
		S1034	1.9	0.02
TGOLN1	MCG129299	S28	4.2	0.02
		S31	5.2	0.02
		S126	37.8	0.02
		T146	4.5	0.02
		S210	2.5	0.02
		S230	2.7	0.03
		S231	2.7	0.02
		S266S67	2.9	0.02
NRD1	Nardilysin	S85	5.1	0.02
WWP2	NEDD4-like E3 ubiquitin-protein ligase WWP2	S211	2.3	0.03
MME	Nepilysin	S6	3.9	0.02

SUPPLEMENTARY DATA

OTUD4	OTU domain-containing protein 4	S1016S1017	13.2	0.02
PNPLA7	Patatin-like phospholipase domain-containing protein 7	S379	5.3	0.02
PJA1	Pja1 protein	S156	7.0	0.02
PGRMC1	Progesterone receptor membrane component 1	T74	7.4	0.02
		T178	13.7	0.02
		Y180S181	26.1	0.02
PSMF1	Proteasome inhibitor PI31 subunit	S153	3.8	0.02
PAG1	Proteasome subunit alpha type	S250	4.0	0.02
DPY19L1	Protein dpy-19 homolog 1	S23	11.4	0.02
TRIP12	Protein Trip12	T1457	4.2	0.02
		T1459	3.7	0.02
HPN	Serine protease hepsin	S15	12.6	0.02
		T16	2.5	0.03
TMEM51	Transmembrane protein 51	S114	1.8	0.02
TAT	Tyrosine aminotransferase	S448	4.6	0.02
USP39	U4/U6.U5 tri-snRNP-associated protein 2	S81	38.1	0.02
COQ9	Ubiquinone biosynthesis protein COQ9, mitochondrial	S81	3.9	0.02
USP	Ubiquitin carboxyl-terminal hydrolase	S691	4.0	0.02
		S2045	6.2	0.02
		S2559	4.4	0.02
USP10	Ubiquitin carboxyl-terminal hydrolase 10	T205	5.2	0.02
		S208	6.1	0.02
		S359	2.5	0.02
USP36	Ubiquitin carboxyl-terminal hydrolase 36	S435	1.9	0.03
USP47	Ubiquitin carboxyl-terminal hydrolase 47	T933S934	1.6	0.02
UBE4B	Ubiquitin conjugation factor E4 B	S105	19.1	0.02
UBA1	Ubiquitin-activating enzyme E1, Chr X	S13	2.6	0.02
UBAP2L	Ubiquitin-associated protein 2-like	T114	2.8	0.02
		S628	31.3	0.02
UBE2E2	Ubiquitin-conjugating enzyme E2 E2	S18	4.5	0.02
UBE2J1	Ubiquitin-conjugating enzyme E2 J1	S266	11.5	0.02
		T267	8.0	0.02
UBL7	Ubiquitin-like protein 7	S230	11.0	0.02
SHP1	UBX domain-containing protein 1	S188	4.2	0.02
<b>Protein folding</b>				
SNTA1	Alpha-1-syntrophin	S194	3.7	0.02
CANX	Calnexin	S553	8.3	0.02
		T561	8.4	0.02
		S563	8.3	0.02
		S582	7.3	0.02
DNAJC5	DnaJ homolog subfamily C member 5	S10	8.3	0.02
		T11	11.3	0.02
DNAJC7	DnaJ homolog subfamily C member 17	S112	2.5	0.03
DNAJC21	Dnajc21 Protein	S132	9.4	0.02
FKBP15	FK506-binding protein 15	S1125	4.4	0.02
		S1159	6.2	0.02
HSP84B	Heat shock protein 84b	S226	5.9	0.02
		S255S261	3.8	0.02
HSP90A	Heat shock protein HSP 90-alpha	S231	2.2	0.03
		S252	3.5	0.02
		S263	3.1	0.02



SUPPLEMENTARY DATA

PPIG	Peptidyl-prolyl cis-trans isomerase G	S685 S714 S742S743T746	25.9 15.2 1.9	0.04 0.03 0.03
FAM54B	Protein FAM54B	S234S235	2.9	0.02
FRA10AC1	Protein FRA10AC1 homolog	S250	2.3	0.02
URI1	Unconventional prefoldin RPB5 interactor	S440	4.9	0.02
<b>Regulation of GTPase activity</b>				
ARFGAP2	ADP-ribosylation factor GTPase-activating protein 2	S236	6.0	0.02
ARFGEF2	ADP-ribosylation factor guanine nucleotide-exchange factor 2 (Brefeldin A-inhibited)	S218T224S227	6.2	0.02
ALKBH3	Alsin	S483	10.1	0.02
AGFG1	Arf-GAP domain and FG repeats-containing protein 1	T177S179S181	3.9	0.02
ASAP2	Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2	S704	2.3	0.02
BCR	Breakpoint cluster region protein	Y31	150.9	0.02
BCAR3	Breast cancer anti-estrogen resistance protein 3	S312	3.0	0.02
	CDC42 GTPase-activating protein	S381 S1163	3.1 4.2	0.02 0.02
ARHGAP5	Rho GTPase-activating protein 5	T1172S1174S1177	4.9	0.02
ARHGEF26	Rho guanine nucleotide exchange factor 26	S390	3.5	0.02
TNKS1BP1	Tankyrase-1-binding protein	S1061S1063 T533 S866 Y910S911 S1131 S1440 S1611S1612 S1657	3.8 3.0 2.3 4.5 4.8 7.4 2.0 4.8	0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02
DENND4A	Dennd4a DENN/MADD domain containing 4A	S1586	3.5	0.02
DENND4C	Dennd4c protein	S1096	5.7	0.02
GBF1	Golgi-specific brefeldin A-resistance guanine nucleotide exchange factor 1	S1298 T1317S1318	5.1 6.7	0.02 0.02
GPN1	GPN-loop GTPase 1	S338	4.6	0.02
G3BP2	GTPase activating protein (SH3 domain) binding protein 2	T227	3.5	0.02
GAPVD1	GTPase-activating protein and VPS9 domain-containing protein 1	S902	6.6	0.02
ITSN1	Itsn1 protein	S334S335	6.8	0.02
ITSN2	Itsn2 protein	S868	2.7	0.02
NOLC1	Nolc1 nucleolar and coiled-body phosphoprotein 1 isoform D	S562	3.7	0.02
RABGAP1	Rab GTPase-activating protein 1	S42	4.7	0.02
RABEP1	Rab GTPase-binding effector protein 1	S323 T324 S326	11.5 5.2 11.5	0.02 0.02 0.02
RABGEF1	Rab5 GDP/GTP exchange factor	T131 S132	2.2 7.8	0.03 0.02

SUPPLEMENTARY DATA

RANBP10	Ran-binding protein 10	S414 S416	5.7 14.8	0.02 0.03
IQGAP2	Ras GTPase-activating protein-binding protein 2	T227 Y14S16	2.8 2.0	0.02 0.03
RASGRP2	RAS guanyl-releasing protein 2	S554	34.7	0.02
ARHGAP1	Rho GTPase activating protein 1	S91	5.7	0.02
ARHGAP6	Rho GTPase-activating protein 6	S824	5.5	0.02
ARHGAP7	Rho GTPase-activating protein 7	S86S89 S818	11.2 5.6	0.02 0.02
ARHGAP12	Rho GTPase activating protein 12	S163	24.0	0.03
ARHGAP17	Rho GTPase-activating protein 17	S162 T164	3.1 2.8	0.02 0.02
ARHGAP35	Rho GTPase-activating protein 35	S769T771 S1179	2.9 5.2	0.02 0.02
ARHGEF	Rho guanine nucleotide exchange factor 7	S132	3.1	0.02
ARHGEF12	Rho guanine nucleotide exchange factor 12	S1327 S1389	1.9 5.8	0.02 0.02
ARHGEF40	Rho guanine nucleotide exchange factor 40	S959	4.0	0.02
RHOJ	Rho-related GTP-binding protein RhoJ	S9	2.4	0.03
SIPA1L1	Sipa1l1 protein	S1564	3.8	0.02
TBC1D10A	TBC1 domain family member 10A	S18	11.6	0.02
<b>Reproduction</b>				
ASZ1	Ankyrin repeat and SAM domain containing 1	S663	2.3	0.02
ARG1	Arginase-1	T281	5.2	0.02
PGRMC2	Membrane-associated progesterone receptor component 2	Y204 T205	7.6 8.9	0.02 0.02
STARD10	PCTP-like protein	S284S289	3.5	0.02
<b>RNA processing</b>				
ASCC3L1	Activating signal cointegrator 1 complex subunit 3-like 1	S225 S339	6.7 3.2	0.02 0.02
DDX51	ATP-dependent RNA helicase DDX51	S77	5.8	0.02
DDX54	ATP-dependent RNA helicase DDX54	T69 S774	1.9 5.1	0.04 0.02
BUD13	BUD13 homolog	T144S148	3.2	0.02
CAST	Calpastatin	S165 S219	3.0 3.6	0.02 0.02
CMTR1	Cap-specific mRNA (nucleoside-2'-O-)-methyltransferase 1	S27S28	5.9	0.02
PCF11	Cleavage and polyadenylation factor subunit homolog ( <i>S. cerevisiae</i> )	S488S495	6.6	0.02
CSTF3	Cleavage stimulation factor subunit 3	S691	7.7	0.02
DCUN1D4	Dcun1d4 protein	S71	7.8	0.02
GM6793	EG627828 protein	S329 S331	4.1 4.5	0.02 0.02
ELAC2	ElaC homolog 2 ( <i>E. coli</i> )	S814	2.9	0.02
ESYT2	Extended synaptotagmin-2	S661S662S663	4.7	0.02
KHSRP	Far upstream element-binding protein 2	S182	7.1	0.02
NOLA4	H/ACA ribonucleoprotein complex subunit 4	S451S453 S481	7.3 4.4	0.02 0.02
HNRNPA1	Heterogeneous nuclear ribonucleoprotein A1	S6	4.6	0.02
HNRNPG	Heterogeneous nuclear ribonucleoprotein	S165	1.6	0.03

SUPPLEMENTARY DATA

	G			
HNRNPH	Heterogeneous nuclear ribonucleoprotein H	S104	5.4	0.02
HNRNPLL	Heterogeneous nuclear ribonucleoprotein L-like	Y36	2.4	0.02
HNRNPA2B1	Heterogeneous nuclear ribonucleoproteins A2/B1	S259	3.2	0.02
HNRNPC	Heterogeneous nuclear ribonucleoproteins C1/C2	S231 S241 S246S249 S268 S306	5.0 16.7 2.2 7.9 4.3	0.02 0.02 0.02 0.02 0.02
HNRPK	Hnrpk protein	Y280 S284 S379	2.9 5.4 3.0	0.02 0.02 0.02
INTS12	Integrator complex subunit 12	S126S127 S377	6.0 2.4	0.02 0.02
DHX9	Isoform 2 of ATP-dependent RNA helicase A	S137	4.4	0.02
DBR1	Lariat debranching enzyme	T502	2.8	0.02
SRSF7	MCG17902, isoform CRA_a	S181S183 S233	4.2 2.0	0.02 0.03
RNMT	mRNA cap guanine-N7 methyltransferase	S11S15	3.6	0.02
CWC22	pre-mRNA-splicing factor CWC22 homolog isoform 2	S38 S829	1.8 5.1	0.03 0.02
PCBP1	Poly(rC)-binding protein 1	S171S173 Y183 S189	3.1 34.4 5.4	0.02 0.02 0.02
PCBP2	Poly(rC)-binding protein 2	S183S185S266	3.8	0.02
PABP2	Polyadenylate-binding protein 2	S146	20.5	0.02
FIP1L1	Pre-mRNA 3'-end-processing factor FIP1	S479	5.6	0.02
PRPF40A	Pre-mRNA-processing factor 40 homolog A	S879S881S884	3.7	0.02
SCAF8	Protein SCAF8	T614S617	5.9	0.02
KIAA1429	Protein virilizer homolog	S173 S1577	9.2 6.6	0.02 0.02
RAVER1	Ribonucleoprotein PTB-binding 1	S576	2.4	0.02
RBM25	RNA-binding protein 25	S673 S675	5.4 14.2	0.02 0.02
RBM26	RNA-binding protein 26	S127	7.2	0.02
RBM33	RNA-binding protein 33	S243	6.5	0.02
RBM39	RNA-binding protein 39	Y95S97 S136	6.0 4.2	0.02 0.02
RALY	RNA-binding protein Raly	S135 T268S270T274	5.5 4.7	0.02 0.02
SRRM1	Serine/arginine repetitive matrix 1	S220 S260 S387S389 S400 S401 T404 S412T414 S427S429 S448S450 S461S463	4.5 3.5 3.5 5.2 3.8 5.2 12.0 8.0 6.1 4.2	0.02 0.02 0.02 0.02 0.02 0.02 0.03 0.02 0.02 0.02



SUPPLEMENTARY DATA

PPP4R4	Serine/threonine-protein phosphatase 4 regulatory subunit 4	S777	11.4	0.02
SFRS11	Sfrs11 protein	Y325	4.3	0.02
		S327	4.4	0.02
		S342	2.9	0.02
		S375	9.2	0.02
SSFA2	Sperm specific antigen 2	S268	1.7	0.02
		S736S738	4.5	0.02
		T1129	5.8	0.03
		S1132	5.9	0.03
SF3B1	Splicing factor 3B subunit 1	T278	6.9	0.03
SF3B2	Splicing factor 3b, subunit 2	S414S418S419	4.8	0.04
SPF45	Splicing factor 45	S155	6.8	0.02
SRSF6	Splicing factor, arginine/serine-rich 6	S303	2.0	0.02
SFSWAP	Splicing factor, suppressor of white-apricot homolog	S601	1.7	0.03
SREK1	Splicing regulatory glutamine/lysine-rich protein 1	S486	5.8	0.03
SMAP2	Stromal membrane-associated protein 2	S219S224	4.8	0.02
ZCCHC6	Terminal uridylyltransferase 7	S645	4.6	0.02
TRA2A	Tra2a transformer-2 protein homolog alpha	T200	2.4	0.03
TRA2B	Transformer-2 protein homolog beta	S95S97S99	2.8	0.02
		S264S266	4.4	0.02
NSUN2	tRNA (cytosine(34)-C(5))-methyltransferase	S688	1.8	0.02
ZRSR1	U2 small nuclear ribonucleoprotein auxiliary factor (U2AF) 1, related sequence 1	S417	3.3	0.03
		S418	18.6	0.02
LUC7	LUC7-like	S162	2.4	0.02
ZC3H4	Zinc finger CCCH domain-containing protein 4	S92S94	15.0	0.02
ZRANB2	Zinc finger, RAN-binding domain containing 2	S120	4.3	0.02
		S153	2.2	0.02
		S188	1.9	0.02
<b>Signal transduction</b>				
PRKAA1	5'-AMP-activated protein kinase catalytic subunit alpha-1	S184S187	4.0	0.02
PRKAA2	5'-AMP-activated protein kinase catalytic subunit alpha-2	S489	7.3	0.02
		S491	7.4	0.02
PRKAB1	5'-AMP-activated protein kinase subunit beta-1	S108	8.2	0.02
PRKAG2	5'-AMP-activated protein kinase subunit gamma-2	S87S90	6.5	0.02
		S194S195S196	3.7	0.02
AKAP1	A-kinase anchor protein 1, mitochondrial	S103	9.9	0.02
		T487	9.1	0.02
AKAP2	A-kinase anchor protein 2	S740	4.4	0.02
AKAP8	A-kinase anchor protein 8	S320S325	1.7	0.03
		S336	1.9	0.02
APBB1IP	Amyloid beta (A4) protein-binding, family B, member 1 interacting protein	S507	9.4	0.02
		S532	7.0	0.02
AAK1	AP2-associated protein kinase 1	S635	2.9	0.02

SUPPLEMENTARY DATA

		T638	2.5	0.02
		T672	1.8	0.02
ARRB1	Beta-arrestin-1	T411S413	2.6	0.02
BAIAP2	Brain-specific angiogenesis inhibitor 1-associated protein 2	S365	4.0	0.02
		S366	2.1	0.02
BAIAP2L1	Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 1	S421	2.5	0.03
BCKDK	Branched chain ketoacid dehydrogenase kinase, isoform CRA_a	T32	6.6	0.02
		S33	6.7	0.02
CALCOCO1	Calcium-binding and coiled-coil domain-containing protein 1	S460	2.6	0.02
		S466	3.7	0.02
CAMSAP2	Calmodulin-regulated spectrin-associated protein 2	S456	4.7	0.02
PRKACB	cAMP-dependent protein kinase catalytic subunit beta	T198	34.4	0.02
PRKAR2B	cAMP-dependent protein kinase type II-beta regulatory subunit	S112	2.1	0.02
CSNK1D	Casein kinase 1, delta	S382	4.0	0.02
COMT	Catechol O-methyltransferase	S261	4.2	0.02
CHN2	Chimerin (Chimaerin) 2	S181	4.0	0.03
CSPG6	Cspg6	S1067	4.7	0.02
PDPK1	3-Phosphoinositide-dependent protein kinase 1	S244	3.7	0.02
DEPTOR	Depdc6-001	S244	3.2	0.02
DAB2IP	Disabled homolog 2-interacting protein	S978	16.8	0.03
DLGAP	Dlgap4 protein	S699	1.6	0.03
EMR1	EGF-like module-containing mucin-like hormone receptor-like 1	S926	4.8	0.02
EPS8	Epidermal growth factor receptor kinase substrate 8	S658	2.4	0.02
FARP1	Farp1 FERMRhoGEF (Arhgef) and pleckstrin domain protein 1	S373	6.2	0.02
		S427	9.2	0.02
		T886	4.2	0.02
FRMD4B	FERM domain-containing protein 4B	Y675S676S678	4.2	0.02
FLT4	FMS-like tyrosine kinase 4	S953	3.1	0.02
GPRC5C	G protein-coupled receptor, family C, group 5, member C	S434	3.6	0.02
		T436	2.1	0.02
GOLPH3	Golph3 protein	S35	29.5	0.03
GRB7	Growth factor receptor-bound protein 7	T417	5.5	0.02
		S420	13.4	0.02
ITPR1	Inositol 1,4,5-trisphosphate receptor type 1	S1588	11.3	0.02
PIIP5K2	Inositol hexakisphosphate and diphosphoinositol-pentakisphosphate kinase 2	S44	4.2	0.02
INPP5F	Inositol polyphosphate-5-phosphatase F	S908S910	3.0	0.02
		S943	5.7	0.02
IR	Insulin receptor	S1337	12.5	0.02
PI4K2B	Isoform 2 of Phosphatidylinositol 4-kinase beta	S294	10.2	0.02
KSR1	Kinase suppressor of ras 1	S297	3.3	0.02
LRRFIP2	Leucine-rich repeat flightless-interacting protein 2	S111	4.7	0.02
		T114	3.6	0.02
TMEM57	Macoilin	S331	11.4	0.02
STK3	Mammalian sterile twenty 3 kinase	T172	3.9	0.03

SUPPLEMENTARY DATA

MAPKAPK2	MAP kinase-activated protein kinase 2	T320T324	3.5	0.02
MAPK14	Mapk14 protein	T180Y182	4.0	0.02
PPP1R12B	MCG130490	T645	3.0	0.02
		S833T836	1.5	0.04
MCC	MCG4620, isoform CRA_b	S293	4.3	0.02
	MCG5232	T19S20	21.2	0.02
MTMR3	MCG9626, isoform CRA_b	S633S636	1.9	0.03
MRAP2	Melanocortin-2 receptor accessory protein	S94T97	5.5	0.02
MTSS1	Metastasis suppressor protein 1	S276	5.6	0.02
		S279	4.8	0.02
MINK1	Misshapen-like kinase 1	S729	3.0	0.02
MFF	Mitochondrial fission factor	S129	13.2	0.02
MAP2K2	Mitogen activated protein kinase kinase 2, isoform CRA_d	S393	5.0	0.02
MARCKS	Myristoylated alanine-rich C-kinase substrate	S46	2.8	0.03
		S138	3.3	0.02
		S141T143	4.1	0.02
SLC9A3R1	Na(+)/H(+) exchange regulatory cofactor NHE-RF1	S273S275	4.9	0.02
		S285S286	3.0	0.02
		T288S294S289S297	3.6	0.02
PDZK1	Na(+)/H(+) exchange regulatory cofactor NHE-RF3	S489S492	5.2	0.03
NUCB1	Nucleobindin-1	S85	3.8	0.03
		S368	3.2	0.02
OSTF1	Osteoclast-stimulating factor 1	Y208	13.0	0.02
GIGYF1	PERQ amino acid-rich with GYF domain-containing protein 1	S864	4.4	0.02
PSD3	PH and SEC7 domain-containing protein 3	S1001	2.1	0.02
		S281	49.1	0.03
		S1009	2.1	0.02
UHRF1	PHD and RING finger domain-containing protein 1	S1201	10.6	0.03
PI4K2	Phosphatidylinositol 4-kinase beta	S428	7.4	0.02
PI4K2A	Phosphatidylinositol 4-kinase type 2-alpha	S47	3.9	0.02
PAQR9	Progesterin and adipoQ receptor family member 9	S33	8.5	0.02
AKT1S1	Proline-rich AKT1 substrate 1	S188	3.1	0.02
PRKD3	Protein kinase D3	S735	11.2	0.02
		T739	3.6	0.02
PRKAR1A	Protein kinase, cAMP dependent regulatory, type I, alpha	S83	4.4	0.02
		S97	2.8	0.02
PRKRA	Protein kinase, interferon inducible double stranded RNA dependent activator	S18	1.6	0.03
LAP2	Protein LAP2	S869	6.1	0.02
NDRG2	Protein NDRG2	S328T330S332	6.2	0.02
		T334	4.8	0.02
		S335S338	6.1	0.02
		S346	3.9	0.02
		T348S350	4.2	0.04
		S352	4.5	0.02
		S355	4.2	0.04
		S353	39.5	0.02
		T357	3.7	0.02
NDRG3	Protein NDRG3	S331	10.2	0.02

SUPPLEMENTARY DATA

PPP1R12A	Protein phosphatase 1 regulatory subunit 12A	T443	4.2	0.02
		S445	3.7	0.02
		Y446	4.2	0.02
		S507	16.8	0.03
		T508	2.7	0.03
		S909	1.9	0.03
PPP1R12C	Protein phosphatase 1 regulatory subunit 12C	S431T432	4.3	0.02
PPP1R12A	Protein phosphatase 1 regulatory subunit 14A	S26	6.9	0.02
		S28	6.5	0.02
		S134S136	3.1	0.02
PPP1R7	Protein phosphatase 1 regulatory subunit 7	S24S27	50.7	0.02
		S45S48	2.6	0.02
PPM1K	Protein phosphatase 1K, mitochondrial	S248	4.2	0.02
SSH1	Protein phosphatase Slingshot homolog 1	S639	3.9	0.02
		S927	3.9	0.03
		S928	4.3	0.02
		S929	4.2	0.02
AKT1	RAC-alpha serine/threonine-protein kinase	S124	3.5	0.02
RGL2	Ral guanine nucleotide dissociation stimulator-like 2	S619	2.3	0.02
RGL3	Ral guanine nucleotide dissociation stimulator-like 3	S506S509	3.3	0.02
RALBP1	RalA-binding protein 1	S29	8.7	0.02
REPS2	RALBP1 associated Eps domain containing protein 2	S531	2.8	0.02
RASAL2	Rasal2 Uncharacterized protein	S986T987	1.9	0.02
RRAS2	Ras-related protein R-Ras2	S186	6.9	0.02
RIPK1	Receptor-interacting serine/threonine-protein kinase 1	S313	3.4	0.02
RAPTOR	Regulatory-associated protein of mTOR	S863	3.8	0.02
		S877	10.5	0.02
ARAF	Serine/threonine-protein kinase A-Raf	S270	60.9	0.02
		S578S580	5.9	0.02
MARK2	Serine/threonine-protein kinase MARK2	T208	7.2	0.02
CDC42BPB	Serine/threonine-protein kinase MRCK beta	S1688S1692	5.2	0.02
PAK4	Serine/threonine-protein kinase PAK 4	S104	3.2	0.02
PRPF4B	Serine/threonine-protein kinase PRP4 homolog	S240S242	14.3	0.03
		S278	2.5	0.02
		S427S437	2.0	0.02
		Y849	7.5	0.02
SGK3	Serine/threonine-protein kinase Sgk3	S126S129	10.1	0.02
SIK3	Serine/threonine-protein kinase SIK3	S493	4.6	0.02
TAO3	Serine/threonine-protein kinase TAO3	S324	3.7	0.02
SHE	SH2 domain-containing adapter protein E	S64	1.7	0.04
SH2B2	SH2B adapter protein 2	S107	1.6	0.03
SH3BP5	SH3 domain-binding protein 5	S422	3.7	0.02
SHC1	SHC-transforming protein 1	S139	6.0	0.02
SNRK	SNF-related serine/threonine-protein kinase	S541	27.4	0.02
		T543	27.2	0.02
		S544	1.6	0.04
		S569S570	3.6	0.02
TENC1	Tensin-like C1 domain-containing phosphatase	S102	6.7	0.02
		T103	3.3	0.02



SUPPLEMENTARY DATA

		S813	7.0	0.02
		S825	1.6	0.03
		S1087	7.5	0.02
TRPM7	Transient receptor potential cation channel subfamily M member 7	T1250	4.8	0.03
		S1502	8.7	0.02
FAS	Tumor necrosis factor receptor superfamily member 6	S220	18.5	0.03
LRRFIP2	leucine-rich repeat flightless-interacting protein 2-like	S107	2.2	0.02
WDR26	WD repeat-containing protein 26	S101S103	3.7	0.02
<b>Transcription</b>				
ATN1	Atrophin-1	S34	6.8	0.03
BCLAF1	Bcl-2-associated transcription factor 1	S177	9.4	0.02
		T256S261	5.1	0.02
		S258	5.0	0.02
		S263	9.2	0.02
		S267	6.3	0.02
		Y283	9.4	0.02
		S286	9.3	0.02
		S289	9.4	0.02
		S395	5.6	0.02
		S494	4.5	0.02
		S510	3.4	0.03
		S529	6.1	0.02
		S646	33.3	0.02
		S656	4.8	0.02
MIIT1	Btk-PH-domain binding protein	S463	2.3	0.02
C2CD2L	C2 domain-containing protein 2-like	S470	7.1	0.02
CARHSP1	Calcium regulated heat stable protein 1	S31	3.1	0.02
CES5B	Carboxylesterase 5, isoform CRA_b	S552	4.5	0.03
CTNNB1	Catenin beta-1	S191	2.6	0.02
		T551	1.6	0.02
		S552	8.2	0.05
CTNND1	Catenin delta-1	Y228	4.4	0.02
		S230	3.5	0.02
		S252	10.4	0.02
		Y257	5.7	0.02
		S268S269	5.3	0.02
		T310	10.1	0.02
		S920	3.9	0.02
CBX1	Cbx1 protein	S89S91	3.9	0.02
CBX3	Cbx3 protein	S93S97	2.3	0.03
		S95	48.7	0.02
		S99	19.5	0.02
CERS2	Ceramide synthase 2	S341	9.8	0.02
CBX5	Chromobox protein homolog 5	S93	7.0	0.02
CHD4	Chromodomain-helicase-DNA-binding protein 4	S1528	20.9	0.03
CHD5	Chromodomain helicase DNA binding protein 5	T1077	3.8	0.03
CC2D1A	Coiled-coil and C2 domain-containing protein 1A	S435	4.3	0.02
CRTC2	CREB-regulated transcription coactivator 2	S612	4.7	0.02
CRTC3	CREB-regulated transcription coactivator 3	S368S370	5.2	0.02
XRN2	5'-3' Exoribonuclease 2	S448	5.2	0.02

SUPPLEMENTARY DATA

		S470	16.3	0.02
		S499S501	6.6	0.02
PSMD9	Proteasome 26S subunit, non-ATPase regulatory subunit 9	S126S128	7.2	0.02
DNA BINDING PROTEIN	DNA-binding protein A	S328	3.4	0.02
POLR3G	DNA-directed RNA polymerase III subunit RPC7	S158	40.0	0.02
EPS8L2	Epidermal growth factor receptor kinase substrate 8-like protein 2	S242	1.8	0.03
		S482	4.6	0.02
		S483	2.2	0.03
		S468	2.1	0.03
ERRFI1	ERBB receptor feedback inhibitor 1	S251S256	5.0	0.02
SSRP2	FACT complex subunit SSRP1	S444	4.3	0.02
FOXK2	Forkhead box protein K2	S329S331	4.6	0.02
FOXO1	Forkhead box protein O1	S284	3.3	0.02
GCFC2	GC-rich sequence DNA-binding factor 1	S262	19.4	0.02
GTF3C2	General transcription factor 3C polypeptide 2	S163	9.2	0.02
HDGF	Hepatoma-derived growth factor	S132S133	6.2	0.02
		S165	6.7	0.02
HDGFRP2	Hepatoma-derived growth factor-related protein 2	S366S367	14.2	0.02
		S620	4.1	0.02
		S629S635	1.8	0.03
HNRNPD0	Heterogeneous nuclear ribonucleoprotein D0	S71S80S82S83	5.7	0.02
HNRNPUL2	Heterogeneous nuclear ribonucleoprotein U-like protein 2	S159T163	3.3	0.02
		S166	1.6	0.03
		S183	15.8	0.02
		S186	16.0	0.02
		S653	3.4	0.02
HMG5	High mobility group nucleosome-binding domain-containing protein 5	S167	2.2	0.02
HDAC2	Histone deacetylase 2	S394	2.3	0.02
HIST1H4	Histone H4	S48	5.6	0.02
EHMT1	Histone-lysine N-methyltransferase EHMT1	S81	11.3	0.02
NSD3	Histone-lysine N-methyltransferase NSD3	S560S561	2.8	0.02
HTATSF1	HIV TAT specific factor 1	S388 S408	2.3	0.03
		S441	3.7	0.02
		S446	4.1	0.03
		S613	1.9	0.03
		S679	2.4	0.02
ING5	Inhibitor of growth protein 5	S148	12.7	0.03
INO80	INO80 complex subunit C	S26	1.9	0.03
IRF2BP1	Interferon regulatory factor 2-binding protein 1	S384	2.2	0.02
		S453	4.5	0.03
IRF2BPL	Interferon regulatory factor 2-binding protein-like	S313	5.6	0.02
		S315	3.0	0.03
		S526	5.3	0.02
IRF3	Interferon regulatory factor 3	S135	5.9	0.02
HABP4	Intracellular hyaluronan-binding protein 4	S74	3.9	0.03
		S108	6.7	0.02
IRF2BP2	Irf2bp2 interferon regulatory factor 2	T73	3.1	0.02

SUPPLEMENTARY DATA

	binding protein 2	S169 S229 S440	5.5 5.1 2.1	0.02 0.02 0.03
KLF12	Krueppel-like factor 12	S202	22.9	0.03
KLF3	Krueppel-like factor 3	S71	4.4	0.02
LDB1	LIM domain-binding protein 1	S305 T306	2.6 4.6	0.02 0.02
PHF2	Lysine-specific demethylase PHF2	S1057 S1059	17.0 2.8	0.02 0.02
MXRA7	Matrix-remodelling associated 7	S79	4.6	0.02
MCG_120563	MCG120563, isoform CRA_a	S91S92	19.4	0.02
	MCG127409	S366	22.9	0.02
SOX6	MCG141507, isoform CRA_a	S98	7.5	0.02
MTFR1	MCG19781, isoform CRA_a	S119	6.2	0.02
MED1	Mediator of RNA polymerase II transcription subunit 1	S1157	5.9	0.03
MED19	Mediator of RNA polymerase II transcription subunit 19	S226	4.2	0.02
MAGI1	Membrane-associated guanylate kinase, WW and PDZ domain-containing protein 1	S733S736 S737	546.6 4.2	0.02 0.02
MTA2	Metastasis-associated protein MTA2	S435	17.0	0.02
MBD2	Methyl-CpG-binding protein 2	S80	2.2	0.02
MYCT1	Myc target protein 1	S66	8.8	0.02
NELFE	Negative elongation factor E	S51 S113 S115	3.0 4.4 3.3	0.02 0.02 0.02
WASL	Neural Wiskott-Aldrich syndrome protein	S422	3.3	0.03
NKAP	NF-kappa-B-activating protein	S141	4.8	0.02
NFIB	nuclear factor 1 B-type isoform X5	S303 S323 S324 T326 S327 S331	10.6 6.4 5.6 5.1 5.1 5.2	0.02 0.02 0.02 0.02 0.02 0.02
ILF3	Interleukin enhancer-binding factor 3	S382	3.5	0.03
NUFIP2	Nuclear fragile X mental retardation-interacting protein 2	S213 S626	3.6 3.7	0.02 0.02
NCOA2	Nuclear receptor coactivator 2	T773	23.2	0.02
NCOA5	Nuclear receptor coactivator 5	S29S34	3.5	0.02
NCOR1	Nuclear receptor corepressor 1	S2198	3.0	0.02
DDX21	Nucleolar RNA helicase 2	S89 T114S118	3.5 6.3	0.03 0.02
PSIP1	PC4 and SFRS1-interacting protein	S105S106 T115 S118 T122S129 T134 T269S270 T271S272S274	3.6 4.3 4.5 4.3 4.9 3.2 19.6	0.02 0.02 0.02 0.02 0.02 0.02 0.02
PNN	Pinin	S66 S100 S120	5.4 5.0 3.8	0.02 0.02 0.02
RING6	Polycomb group RING finger protein 6	S118	3.9	0.02
PKD2	Polycystin-2	S810	9.2	0.02

SUPPLEMENTARY DATA

PROX1	Prospero homeobox protein 1	S177 S197 S199 S511	3.6 6.5 4.1 5.5	0.02 0.02 0.02 0.02
LYRIC	Protein LYRIC	S417S423 T561	4.6 7.6	0.02 0.02
PML	Protein PML	S17 T535	5.6 6.8	0.02 0.02
RRP5	Protein RRP5 homolog	S1468	3.3	0.02
ZMYND8	Protein Zmynd8	S649 S754	2.9 1.9	0.02 0.02
RPRD1B	Regulation of nuclear pre-mRNA domain-containing protein 1B	S132 S134	4.5 3.9	0.02 0.02
RPS6KA4	Ribosomal protein S6 kinase alpha-4	S745	2.5	0.02
RBM5	RNA binding motif protein 15	S127 S258Y265 S291 T668S674S678	5.6 4.1 3.9 4.8	0.02 0.02 0.02 0.02
ELL	RNA polymerase II elongation factor ELL	S299 S300	8.0 7.7	0.02 0.02
RPAP3	RNA polymerase II-associated protein 3	S429	3.1	0.02
CTR9	RNA polymerase-associated protein CTR9 homolog	S941S943 S970 S1039S1041 S1079S1083	8.2 7.6 26.4 23.2	0.02 0.02 0.02 0.02
RBM10	RNA-binding protein 10	S718S723	5.5	0.02
RBM14	RNA-binding protein 14	T206	5.0	0.02
RPRD1B	Rprd1b Protein	S33	3.0	0.02
SLTM	SAFB-like transcription modulator	S289 T535 S550 S995 S996T997S999	5.4 4.9 11.6 7.1 3.8	0.02 0.02 0.02 0.02 0.02
SRSF10	Serine/arginine-rich splicing factor 10	S131S133	2.5	0.02
STAT5B	Signal transducer and activator of transcription 5B	Y699	4.6	0.02
SUDS3	Sin3 histone deacetylase corepressor complex component SDS3	S234S236S237	3.1	0.02
SGTA	Small glutamine-rich tetratricopeptide repeat-containing protein alpha	T82 S303 T305S307	2.0 2.1 2.6	0.02 0.03 0.02
SLIRP	SRA stem-loop-interacting RNA-binding protein, mitochondrial	T104	5.2	0.02
SKIV2L	Superkiller viralicidic activity 2-like (S. cerevisiae)	S240	6.8	0.02
SMARCC1	SWI/SNF complex subunit SMARCC1	S327S329	10.2	0.02
SMARCC2	SWI/SNF complex subunit SMARCC2	S283 S302S304S306T308	7.4 6.0	0.02 0.02
TBX3	Tbx3 protein	S387	9.7	0.02
TCF20	Tcf20 protein	S588	5.8	0.02
TCOF1	Tcof1 protein	S592S593	4.7	0.02
THRAP3	Thrap3 protein	S34S45 T47	8.7 8.8	0.02 0.02
THRAP3	Thyroid hormone receptor associated	S183	4.6	0.02

SUPPLEMENTARY DATA

	protein 3	S240	5.4	0.02
		S248S253	5.2	0.02
		S669	2.3	0.03
		S184	15.7	0.02
		S187	10.3	0.02
		S190	15.7	0.02
		S679	4.7	0.02
		S695	16.6	0.03
TNS1	Torsin-1A-interacting protein 1	S140	10.3	0.02
TCEA1	Transcription elongation factor A protein 1	S96	6.1	0.02
		S97	4.7	0.02
		S100	7.5	0.02
TCEB3	Transcription elongation factor B polypeptide 3	S195	1.7	0.02
ETV6	Transcription factor ETV6	Y17T18	4.0	0.02
PURB	Transcriptional activator protein Pur-beta	S310S316	3.3	0.03
ATRX	Transcriptional regulator ATRX	Y89	4.2	0.02
		S92T98	5.4	0.02
		S912	1.6	0.03
TMCO1	Transmembrane and coiled-coil domains protein 1	S410	4.3	0.02
TRIM28	Tripartite motif-containing 28	S50	2.5	0.02
		S51	6.0	0.02
		S473	4.8	0.02
		T599	9.3	0.02
ZFP36	Tristetraprolin	S176	5.7	0.02
IFI204	Interferon-activable protein 204	S190	4.3	0.02
MYG1	UPF0160 protein MYG1, mitochondrial	S283	4.7	0.02
GPBP1L1	Vasculin-like protein 1	S76	4.1	0.03
		S351	4.2	0.02
YBX1	Y box protein 1	S163	4.8	0.02
		S172	4.1	0.02
		S174	9.3	0.02
YAP1	Yorkie homolog	S94T95	61.2	0.02
		S112	45.4	0.03
ZC3H3	Zc3h13 Zinc finger CCCH type containing 13	S921T926Y927	3.8	0.03
		S953	3.1	0.03
ZFP869	Zfp869 zinc finger protein 869	S155	7.3	0.02
ZBTB7A	Zinc finger and BTB domain-containing protein 7A	S537	3.5	0.02
ZC3H14	Zinc finger CCCH domain-containing protein 14	S515	4.4	0.02
ZC3H18	Zinc finger CCCH domain-containing protein 18	S45	1.7	0.03
		T62S64S71	4.0	0.02
		S92	1.7	0.03
		S507	1.5	0.04
		S552	4.0	0.02
		S849	5.9	0.02
		S890	2.3	0.02
ZNF326	Zinc finger protein 326	S270	9.5	0.02
		T274	6.3	0.03
ZNF687	Zinc finger protein 687	S226	5.1	0.02
DPF2	Zinc finger protein ubi-d4	S142	3.4	0.02
<b>Translation</b>				
CTIF	CBP80/20-dependent translation initiation	S18	2.7	0.02

SUPPLEMENTARY DATA

	factor				
CLASP2	Clasp2 protein	S376	10.5	0.02	
EEF1D	Eef1d protein	T124	4.4	0.02	
		S133	4.8	0.02	
		T142	3.4	0.02	
		S157	3.0	0.02	
EFHD2	EF hand domain containing 2	S74	3.9	0.02	
EFB1	Elongation factor 1-beta	S82	4.6	0.02	
		S106	3.1	0.02	
		S112	6.8	0.02	
EFT2	Elongation factor 2	T54	9.4	0.02	
		T57T59	11.0	0.02	
EEF2K	Eukaryotic elongation factor 2 kinase	S437	11.2	0.02	
		Y442	6.0	0.02	
		S473	6.2	0.02	
EIF3B	Eukaryotic translation initiation factor 3 subunit B	S90	3.0	0.02	
		T74S75S79	4.2	0.02	
		S120S123	5.2	0.02	
EIF3C	Eukaryotic translation initiation factor 3 subunit C	S39	5.8	0.02	
EIF3G	Eukaryotic translation initiation factor 3 subunit G	T38	7.5	0.02	
		T41	7.8	0.02	
		S42	5.3	0.02	
EIF4G1	Eukaryotic translation initiation factor 4 gamma 1	S1096	11.8	0.02	
		S1187	16.9	0.02	
		S1189	6.5	0.02	
		S1211	9.6	0.02	
EIF4G2	Eukaryotic translation initiation factor 4 gamma 2	T507	5.0	0.02	
EIF4G3	Eukaryotic translation initiation factor 4 gamma 3	S267	6.2	0.02	
		S1150	7.1	0.02	
		S1151	3.4	0.02	
EIF4B	Eukaryotic translation initiation factor 4B	S418T420S422	10.6	0.03	
		S424	5.5	0.03	
		S497	4.1	0.02	
		S498	5.0	0.02	
		T500	4.6	0.02	
		S504	2.9	0.03	
EIF5B	Eukaryotic translation initiation factor 5B	T107S108S114*	1.9	0.02	
		S114	3.2	0.02	
		S137S139	4.4	0.02	
		S165	81.1	0.04	
		S215	4.3	0.02	
INADL	InaD-like protein	S455S459	3.2	0.02	
		S457	3.0	0.03	
LRRC47	Leucine rich repeat containing 47	S293	1.9	0.03	
		MCG10050	S102S105	16.2	0.02
RPLP1	MCG10168	S101S104	7.9	0.02	
		MCG1128, isoform CRA_c	S237	5.1	0.02
RPS27A	MCG13441	S115	4.7	0.02	
		MCG142467	S44	4.0	0.02
		S45	3.8	0.02	
MES1	Methionyl-tRNA synthetase, cytoplasmic	S827	10.9	0.02	
NOP56	Nucleolar protein 56	S513	75.0	0.03	
		S528S529	6.6	0.02	

SUPPLEMENTARY DATA

		S536S543	33.9	0.02
NOP58	Nucleolar protein 58	S509 T515 S516 S521	8.0 13.3 5.3 8.0	0.02 0.02 0.02 0.02
NIBAN	Protein Niban	S595	4.3	0.02
PUM2	Pumilio homolog 2	S136 S181	5.2 4.5	0.02 0.02
RPL13	Ribosomal protein L13	S140	3.5	0.02
RPS6	Ribosomal protein S3	T220	5.3	0.02
RPS6	Ribosomal protein S6	S235S236S240 T241	12.3 1.8	0.02 0.02
P0	Ribosomal protein, large, P0	S304S307	7.8	0.02
TNRC6B	Trinucleotide repeat-containing gene 6B protein	S600	2.7	0.02
<b>Transport</b>				
SLC33A1	Acetyl-coenzyme A transporter 1	S42	16.9	0.02
ACBP5	Acyl-CoA-binding domain-containing protein 5	S252S253	17.9	0.02
HBA-A1	Alpha globin 1	S4S9	4.0	0.02
ADD1	Alpha-adducin	S586	14.4	0.02
ENSA	Alpha-endosulfine	S108	44.1	0.02
AP3B1	AP-3 complex subunit beta-1	Y274 S276	2.6 3.6	0.02 0.02
AP3D1	AP-3 complex subunit delta-1	S755T758S760 S784	4.6 7.4	0.02 0.02
AQP7	Aquaporin-7	S295	5.6	0.02
ABCA1	ATP-binding cassette sub-family F member 1	S107 S138 S193 S225	5.5 4.2 6.4 9.1	0.02 0.02 0.03 0.02
BETA-GLOBIN	Beta-globin	S45 S51 S53 T70 S81	5.5 5.5 5.0 3.2 3.9	0.02 0.02 0.02 0.02 0.02
ABCB11	Bile salt export pump	S688Y689 S696	4.5 6.9	0.02 0.02
ABCC1	Canalicular multispecific organic anion transporter 1	S279	5.1	0.02
IGF2R	Cation-independent mannose-6-phosphate receptor	S2401	5.2	0.02
COPB2	Coatomer subunit beta'	S845	4.2	0.02
UQCRC1	Cytochrome b-c1 complex subunit 1, mitochondrial	S212T214	9.2	0.02
PITPNC1	Cytoplasmic phosphatidylinositol transfer protein 1	S274	14.7	0.02
RANBP	E3 SUMO-protein ligase RanBP2	S1603 S2088 S2640S2641T2646	19.6 4.4 4.8	0.02 0.02 0.02
SLC4A4	Electrogenic sodium bicarbonate cotransporter 1	S239 S245	4.4 6.7	0.02 0.02

SUPPLEMENTARY DATA

		T254S255S256S257	6.6	0.02
		S1069	5.2	0.02
ERC1	ELKS/Rab6-interacting/CAST family member 1	S14	7.4	0.02
		S15	7.2	0.02
		S17S21	7.7	0.02
		S37	3.9	0.02
ADD3	Gamma-adducin	S679	2.2	0.02
GJB1	Gap junction protein beta 1	S233	101.3	0.02
		S258	21.6	0.02
		S266	378.6	0.02
USO1	General vesicular transport factor p115	S940	4.8	0.02
GOLIM4	Golgi integral membrane protein 4	S540	3.4	0.02
	Isoform 2 of Sorbin and SH3 domain-containing protein 1	S409S410S411S413	13.7	0.04
		T414	12.3	0.03
KLHDC7A	Kelch domain-containing protein 7A	S361	11.5	0.02
LBR	Lamin-B receptor	S101	1.8	0.03
LARP4B	La-related protein 4B	T735S739	3.1	0.03
BAG6	Large proline-rich protein BAG6	S995	6.4	0.02
SLC7A2	Low affinity cationic amino acid transporter 2	S645	7.7	0.02
	MCG11503	T230S231	3.3	0.02
STIM2	MCG1293	S661	6.4	0.02
ATP2B1	MCG13663, isoform CRA a	S1140	7.8	0.02
SLCO1A1	MCG6998, isoform CRA b	S649	34.3	0.02
MIA3	Melanoma inhibitory activity protein 3	S615S617	5.3	0.02
		S766	33.7	0.02
SLC16A1	Monocarboxylate transporter 1	S210S213	2.2	0.03
		S461T462	2.8	0.02
		S491	6.9	0.02
SLC16A10	Monocarboxylate transporter 10	S498	48.2	0.02
		S501	48.6	0.02
BLT	Multidrug resistance protein 2	S665T666	4.2	0.03
NACA	Nascent polypeptide-associated complex subunit alpha	S151	5.2	0.02
		T157	118.6	0.02
		T159	1.6	0.04
		T161	57.6	0.02
		S166	7.6	0.02
SCP2	Non-specific lipid-transfer protein	S8	4.8	0.02
		S420	1.8	0.03
		T424S425	5.2	0.03
NUP98	Nucleoporin 98	S888	1.8	0.02
OSBPL9	Oxysterol-binding protein 9	S319	3.9	0.02
		T327S329S330	4.8	0.02
OSBPL11	oxysterol-binding protein-related protein 11	S21	8.3	0.02
		S188	4.0	0.02
		S189S192	4.2	0.02
PEX1	Peroxisome biogenesis factor 1	S1182	2.2	0.03
		S1212	2.6	0.03
		S1217	5.6	0.02
FXYD1	Phospholemman	S82S83	23.5	0.02
KCNK5	Potassium channel TASK2	S266	1.6	0.04
KCNQ2	Potassium voltage-gated channel, subfamily Q, member 2	S406	3.5	0.02



SUPPLEMENTARY DATA

PPF1A1	Ppf1a1 protein	S239S242	6.1	0.02
PSEN2	Presenilin-2	S52	3.8	0.02
CASC3	Protein CASC3	S145	10.0	0.02
SET	Protein SET	S30	4.0	0.02
SEC16B	Protein transport protein Sec16B	S137	2.5	0.02
		S939	14.0	0.02
		S944	11.0	0.03
		T950	14.0	0.02
SEC24A	Protein transport protein Sec24A	T227	4.6	0.02
SEC31A	Protein transport protein Sec31A	S526	7.6	0.02
RANBP3	Ran-binding protein 3	T56	7.3	0.02
		S57	5.0	0.02
		S58	5.3	0.02
		T60	5.0	0.02
RRBP1	Ribosome binding protein 1	S134	6.0	0.02
		S959	2.6	0.02
ATP2A2	Sarcoplasmic/endoplasmic reticulum calcium ATPase 2	S661S663	6.1	0.02
SEC16A	SEC16 homolog A ( <i>S. cerevisiae</i> )	S2101	5.6	0.02
SEC23IP	SEC23-interacting protein	S735	8.8	0.03
Slc16a7	Slc16a7 protein	S214	3.2	0.02
		S218T219	3.3	0.02
SLC6A13	Sodium- and chloride-dependent GABA transporter 2	T587	15.3	0.02
		T590	16.3	0.02
SLC10A1	Sodium/bile acid cotransporter	T330	6.9	0.02
SLC38A3	Sodium-coupled neutral amino acid transporter 3	S53	11.1	0.02
SLC38A4	Sodium-coupled neutral amino acid transporter 4	S49	2.5	0.02
SLC20A2	Sodium-dependent phosphate transporter 2	S316	9.2	0.02
SLC2A2	Solute carrier family 2, facilitated glucose transporter member 2	S520S522	5.3	0.02
SLC4A1AP	Solute carrier family 4 (Anion exchanger), member 1, adaptor protein	S50	2.3	0.02
SLCO1A4	Solute carrier organic anion transporter family member 1A4	S657	3.4	0.02
		T659	3.3	0.02
SLCO1B2	Solute carrier organic anion transporter family member 1B2	S290	29.0	0.02
		S288	8.6	0.02
		T662	1.5	0.03
SLCO2B1	Solute carrier organic anion transporter family member 2B1	S21S27	6.8	0.02
		S312T313S315	11.7	0.03
SORBS1	Sorbin and SH3 domain-containing protein 1	S62	4.2	0.02
		T1207S1209	2.8	0.02
SORBS2	Sorbs2 protein	S27	5.5	0.02
		S274S276	1.8	0.03
		S338	1.8	0.03
		S357	10.2	0.02
		S377S378S380	3.9	0.02
		S567S570	3.6	0.02
SNX17	Sorting nexin-17	S433S434S437S440	4.8	0.02
STIM1	Stromal interaction molecule 1	S512	6.0	0.02
		T517	5.5	0.02
		S519S521S523	28.0	0.02
SNAP	Synaptosomal-associated protein	S110S112	4.4	0.02

SUPPLEMENTARY DATA

SNAP29	Synaptosomal-associated protein 29	S163	3.8	0.02
STX4	Syntaxin-4	S15	5.8	0.02
		S117	5.9	0.02
STX12	Syntaxin 12	S142	2.2	0.02
TMX1	Thioredoxin-related transmembrane protein 1	S245	31.0	0.02
TRAM1	Tram1 protein	S365	12.4	0.02
SEC62	Translocation protein SEC62	T158	3.3	0.02
		S356	9.3	0.02
		T375	11.4	0.02
TCOF1	Treacle protein	S1252	17.6	0.03
VPS4B	Vacuolar protein sorting 4b (Yeast)	S92	3.2	0.02
		S102	3.8	0.02
VPS4A	Vacuolar protein sorting-associated protein 4A	S90	8.9	0.02
		S95	5.7	0.03
		S97	8.9	0.02
		S99	7.9	0.03
VPS26B	Vacuolar protein sorting-associated protein 26B	S304	4.2	0.02
<b>Tumorigenesis</b>				
FLCN	Folliculin	S62	10.4	0.02
PRCC	Papillary renal cell carcinoma (Translocation-associated)	S157S159	4.6	0.02
TPD52	Tumor protein D52	S175	3.0	0.02
TPD54	Tumor protein D54	S180	5.5	0.02
TP53I11	Tumor protein p53-inducible protein 11	S14	5.8	0.02
<b>Function unknown</b>				
GPR182	Adrenomedullin receptor	S364	4.6	0.02
CB1_000089029	Ahnak AHNAK nucleoprotein isoform 1	S136	3.5	0.03
		S217	2.6	0.02
		S5504	2.8	0.02
ANKRD57	Ankyrin repeat domain-containing protein 57	S82	2.9	0.02
RSRC2	Arginine/serine-rich coiled-coil protein 2	S45	4.6	0.02
	ASL1/Dennd1b fusion protein	S163S164	8.4	0.02
	Cobl-like 1	T266	4.6	0.02
		S268T272	3.0	0.02
		T287	2.8	0.02
		S334	7.7	0.02
		S476T480	3.5	0.02
		S483	3.4	0.02
		T594S596	3.4	0.02
		S724	5.6	0.02
		S826	6.8	0.02
		S827	4.8	0.02
		S1022	8.4	0.02
		S1144	6.7	0.02
		S1145T1147	3.5	0.02
S1196	2.0	0.03		
FAM104a	DNA segment, Chr 11, Wayne State University 99, expressed	S15	1.6	0.04
FAM208A	Isoform 2 of Protein FAM208A	S653	7.3	0.02
	Isoform 2 of Uncharacterized protein C18orf25 homolog	S66S69	4.6	0.02

SUPPLEMENTARY DATA

KIDINS220	Kidins220 Kidins220 protein	S1583	13.7	0.02
LARP1B	Larp2 protein	S60	6.9	0.02
	Likely ortholog of H. sapiens chromosome 9 open reading frame 138 (C9orf138)	T311	4.1	0.03
RAPH1	MCG116540, isoform CRA_b	S192	3.4	0.02
WDR20	MCG14935, isoform CRA_a	S434	5.3	0.02
		S491S492	3.9	0.02
PDAP1	MCG17262	S48	3.3	0.03
		S60S63	7.1	0.02
	MCG19001	S15S17	4.1	0.02
		S261	4.6	0.02
9430020K01RI K	MCG55337	S542	3.6	0.02
	MCG7378	S7	8.3	0.02
		S13S17S19	12.0	0.02
NAV2	Nav2 neuron navigator 2 isoform 1	S1262	5.1	0.02
NCK1	Non-catalytic region of tyrosine kinase adaptor protein 1	S91	2.9	0.02
	Novel protein	S25	2.2	0.02
PCDH1	Pcdh1 Protocadherin 1 isoform 2	S1010S1012	9.7	0.02
PLEKHA6	Pleckstrin homology domain-containing family A member 6	S901	4.2	0.03
		S967	5.3	0.02
ALKBH5	Probable alpha-ketoglutarate-dependent dioxygenase ABH5	S384S385	4.3	0.02
FAM122A	Protein FAM122A	S34	2.0	0.02
		S73	6.6	0.02
		S140S144	4.2	0.02
FAM40A	Protein FAM40A	S335	3.5	0.02
GM7694	Protein Gm7694	S47	2.2	0.02
		S219	3.4	0.02
KRI1	Protein KRI1 homolog	S148	5.2	0.02
KTI12	Protein KTI12 homolog	S157	2.8	0.02
MB21D2	Protein MB21D2	T371	3.1	0.02
PRRC2C	Protein PRRC2C	T353	2.6	0.02
		S897	16.7	0.03
		S899	24.7	0.02
	Putative monooxygenase p33MONOX isoform 3	S158	3.0	0.03
		S159T160	3.6	0.02
		S164	3.2	0.02
RSRC2	Rsrc2 arginine/serine-rich coiled-coil protein 2 isoform 1	S27	2.7	0.02
		S30	2.8	0.02
D623_1003269 3	Run domain Beclin-1 interacting and 33ysteine-rich containing protein	S412	2.7	0.02
	Testis development-related protein isoform X3	S178	10.1	0.02
		T183	9.3	0.02
		T185	9.2	0.02
TEX-2	Testis expressed gene 2	S743	5.6	0.02
		S749	2.2	0.03
TEX264	Tex264 testis expressed gene 264	T237	3.8	0.02
		S302T303	6.0	0.02
THUMPD1	THUMP domain-containing protein 1	S86S88	6.1	0.02
UBN2	Ubinuclein-2	S570	119.3	0.02
	I700021F05Rik Uncharacterized protein C6orf203 homolog	S106	2.5	0.03

SUPPLEMENTARY DATA

UHRFIBPIL	UHRFI-bindingprotein !-like	S418T420	4.1	0.02
	Uncharacterized protein CIOorf47 homolog	T222S223	2.9	0.02
KIAA1671	Uncharacterized protein KIAA1671	S205	5.4	0.02
CX026	UPF0368 protein Cxorf26 homolog	S184	3.3	0.02
CX052	UPF0690 protein Clorf52 homolog	T153	3.8	0.02
WDR81	<b>\VD repeat-containing protein 81</b>	S85	2.6	0.02