Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
		UPS	proteasome & associates										
		UPS	proteasome & associates	core particle subunit									
PSMA1	Proteasome subunit alpha type-1	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P25786	5682	HC2 NU PROS30 PSC2	263	29556
PSMA2	Proteasome subunit alpha type-2	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P25787	5683	HC3 PSC3	234	25899
PSMA3	Proteasome subunit alpha type-3	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P25788	5684	HC8 PSC8	255	28433
PSMA4	Proteasome subunit alpha type-4	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P25789	5685	HC9 PSC9	261	29484
PSMA5	Proteasome subunit alpha type-5	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P28066	5686		241	26411
PSMA6	Proteasome subunit alpha type-6	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	P60900	5687	PROS27	246	27399
PSMA7	Proteasome subunit alpha type-7	UPS	proteasome & associates	core particle subunit	constitutive	alpha subunit	IPR001353, IPR023332	(none noted)	O14818	5688	HSPC	248	27887
PSMB1	Proteasome subunit beta type-1	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P20618	5689	PSC5	241	26489
PSMB2	Proteasome subunit beta type-2	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P49721	5690		201	22836
PSMB3	Proteasome subunit beta type-3	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P49720	5691		205	22949
PSMB4	Proteasome subunit beta type-4	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P28070	5692	PROS26	264	29204
PSMB5	Proteasome subunit beta type-5	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P28074	5693	LMPX MB1 X	263	28480
PSMB6	Proteasome subunit beta type-6	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	P28072	5694	LMPY Y	239	25358
PSMB7	Proteasome subunit beta type-7	UPS	proteasome & associates	core particle subunit	constitutive	beta subunit	IPR001353, IPR023333	(none noted)	Q99436	5695	Z	277	29965
PSMA8	Proteasome subunit alpha-type 8	UPS	proteasome & associates	core particle subunit	specialized	alpha subunit	IPR001353, IPR023332	(none noted)	Q8TAA3	143471	PSMA7L	256	28530
PSMB8	Proteasome subunit beta type-8	UPS	proteasome & associates	core particle subunit	specialized	beta subunit	IPR001353, IPR023333	(none noted)	P28062	5696	LMP7 PSMB5i RING10 Y2	276	30354
PSMB9	Proteasome subunit beta type-9	UPS	proteasome & associates	core particle subunit	specialized	beta subunit	IPR001353, IPR023333	(none noted)	P28065	5698	LMP2 PSMB6i RING12	219	23264
PSMB10	Proteasome subunit beta type-10	UPS	proteasome & associates	core particle subunit	specialized	beta subunit	IPR001353, IPR023333	(none noted)	P40306	5699	LMP10 MECL1	273	28936
PSMB11	Proteasome subunit beta type-11	UPS	proteasome & associates	core particle subunit	specialized	beta subunit	IPR001353, IPR023333	(none noted)	A5LHX3	122706		300	32530
		UPS	proteasome & associates	regulatory particle subunit									
PSMC1	26S proteasome regulatory subunit 4	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P62191	5700		440	49185
PSMC2	26S proteasome regulatory subunit 7	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P35998	5701	MSS1	433	48634
PSMC3	26S proteasome regulatory subunit 6A	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P17980	5702	TBP1	439	49204
PSMC4	26S proteasome regulatory subunit 6B	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P43686	5704	MIP224 TBP7	418	47366
PSMC5	26S proteasome regulatory subunit 8	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P62195	5705	SUG1	406	45626
PSMC6	26S proteasome regulatory subunit 10B	UPS	proteasome & associates	regulatory particle subunit	ATPase		(none noted)	IPR003593	P62333	5706	SUG2	389	44173
PSMD1	26S proteasome non-ATPase regulatory subunit 1	UPS	proteasome & associates	regulatory particle subunit	nonATPase	idiosyncratic Ub binding / Armadillo-like	(none noted)	IPR011989	Q99460	5707		953	105836
PSMD2	26S proteasome non-ATPase regulatory subunit 2	UPS	proteasome & associates	regulatory particle subunit	nonATPase	Armadillo-like	(none noted)	IPR011989	Q13200	5708	TRAP2	908	100200
PSMD4	26S proteasome non-ATPase regulatory subunit 4	UPS	proteasome & associates	regulatory particle subunit	nonATPase	VWA, UIM	(none noted)	IPR002035, IPR003903	P55036	5710	MCB1	377	40737
ADRM1	Proteasomal ubiquitin receptor ADRM1	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PRU, DEUBAD	(none noted)	IPR044868, IPR044867	Q16186	11047	GP110	407	42153
PSMD7	26S proteasome non-ATPase regulatory subunit 7	UPS	proteasome & associates	regulatory particle subunit	nonATPase	MPN	(none noted)	IPR037518	P51665	5713	MOV34L	324	37025
PSMD14	26S proteasome non-ATPase regulatory subunit 14	UPS	proteasome & associates	regulatory particle subunit	nonATPase	MPN	(none noted)	IPR037518	O00487	10213	POH1	310	34577
PSMD3	26S proteasome non-ATPase regulatory subunit 3	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717, IPR011990	O43242	5709		534	60978
PSMD6	26S proteasome non-ATPase regulatory subunit 6	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717, IPR011990	Q15008	9861	KIAA0107 PFAAP4	389	45531
PSMD11	26S proteasome non-ATPase regulatory subunit 11	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717, IPR011990	O00231	5717		422	47464
PSMD8	26S proteasome non-ATPase regulatory subunit 8	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717	P48556	5714		350	39612
PSMD12	26S proteasome non-ATPase regulatory subunit 12	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717	O00232	5718		456	52904
PSMD13	26S proteasome non-ATPase regulatory subunit 13	UPS	proteasome & associates	regulatory particle subunit	nonATPase	PCI	(none noted)	IPR000717	Q9UNM6	5719		376	42945
SEM1	26S proteasome complex subunit SEM1	UPS	proteasome & associates	regulatory particle subunit	nonATPase	SEM1	(none noted)	IPR007834	P60896	7979	C7orf76 DSS1 SHFDG1 SHFM1	70	8278
		UPS	proteasome & associates	assembly chaperones									
POMP	Proteasome maturation protein	UPS	proteasome & associates	assembly chaperones	core particle		(none noted)	IPR008012	Q9Y244	51371	C13orf12 UMP1	141	15789
PSMG1	Proteasome assembly chaperone 1	UPS	proteasome & associates	assembly chaperones	core particle		(none noted)	IPR016565	O95456	8624	C21LRP DSCR2 PAC1	288	32854
PSMG2	Proteasome assembly chaperone 2	UPS	proteasome & associates	assembly chaperones	core particle		(none noted)	IPR038389	Q969U7	56984	HCCA3 PAC2 TNFSF5IP1	264	29396
PSMG3	Proteasome assembly chaperone 3	UPS	proteasome & associates	assembly chaperones	core particle		(none noted)	IPR018788	Q9BT73	84262	C7orf48 PAC3	122	13104
PSMG4	Proteasome assembly chaperone 4	UPS	proteasome & associates	assembly chaperones	core particle		(none noted)	IPR032157	Q5JS54	389362	C6orf86 PAC4	123	13775
PSMD5	26S proteasome non-ATPase regulatory subunit 5	UPS	proteasome & associates	assembly chaperones	regulatory particle		(none noted)	IPR011989	Q16401	5711	KIAA0072	504	56196
PSMD9	26S proteasome non-ATPase regulatory subunit 9	UPS	proteasome & associates	assembly chaperones	regulatory particle		(none noted)	IPR036034	O00233	5715		223	24682
PSMD10	26S proteasome non-ATPase regulatory subunit 10	UPS	proteasome & associates	assembly chaperones	regulatory particle		(none noted)	IPR036770	O75832	5716		226	24428
PAAF1	Proteasomal ATPase-associated factor 1	UPS	proteasome & associates	assembly chaperones	regulatory particle		(none noted)	IPR036322	Q9BRP4	80227	WDR71	392	42190
		UPS	proteasome & associates	activators and inhibitors									
ECPAS	Proteasome adapter and scaffold protein ECM29	UPS	proteasome & associates	activators and inhibitors	inhibitor	Armadillo-like	(none noted)	IPR011989	Q5VYK3	23392	ECM29, KIAA0368	1845	204291
PSME4	Proteasome activator complex subunit 4	UPS	proteasome & associates	activators and inhibitors	activator	Armadillo-like	(none noted)	IPR011989	Q14997	23198	KIAA0077	1843	211334
PSMF1	Proteasome inhibitor PI31 subunit	UPS	proteasome & associates	activators and inhibitors	activator	PI31	(none noted)	IPR013886, IPR021625	Q92530	9491		271	29817
PSME1	Proteasome activator complex subunit 1	UPS	proteasome & associates	activators and inhibitors	activator	PA28	(none noted)	IPR003185, IPR003186	Q06323	5720	IFI5111	249	28723

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PSME2	Proteasome activator complex subunit 2	UPS	proteasome & associates	activators and inhibitors	activator	PA28	(none noted)	IPR003185, IPR003186	Q9UL46	5721		239	27402
PSME3	Proteasome activator complex subunit 3	UPS	proteasome & associates	activators and inhibitors	activator	PA28	(none noted)	IPR003185, IPR003186	P61289	10197		254	29506
		UPS	proteasome & associates	associated DUB									
USP14	Ubiquitin carboxyl-terminal hydrolase 14	UPS	proteasome & associates	associated DUB	USP		(none noted)	IPR000626, IPR028889	P54578	9097	TGT	494	56069
UCHL5	Ubiquitin carboxyl-terminal hydrolase isozyme L5	UPS	proteasome & associates	associated DUB	UCH		(none noted)	IPR001578	Q9Y5K5	51377	UCH37	329	37607
		UPS	proteasome & associates	associated E3 ligase									
UBE3A	Ubiquitin-protein ligase E3A	UPS	proteasome & associates	associated E3 ligase	HECT		(none noted)	IPR000569	Q05086	7337	E6AP EPVE6AP HPVE6A	875	100688
UBE3C	Ubiquitin-protein ligase E3C	UPS	proteasome & associates	associated E3 ligase	HECT		(none noted)	IPR000569	Q15386	9690	KIAA0010 KIAA10	1083	123923
TRIP12	E3 ubiquitin-protein ligase TRIP12	UPS	proteasome & associates	associated E3 ligase	HECT		(none noted)	IPR000569, IPR011989	Q14669	9320	KIAA0045 ULF	1992	220434
PRKN	E3 ubiquitin-protein ligase parkin	UPS	proteasome & associates	associated E3 ligase	RING, UBL		(none noted)	IPR000626, IPR041170, IPR002867, IPR041565	O60260	5071	PARK2	465	51641
UBR1	E3 ubiquitin-protein ligase UBR1	UPS	proteasome & associates	associated E3 ligase	UBR		(none noted)	IPR003126	Q8IWV7	197131		1749	200211
UBR2	E3 ubiquitin-protein ligase UBR2	UPS	proteasome & associates	associated E3 ligase	UBR		(none noted)	IPR003126	Q8IWV8	23304	C6orf133 KIAA0349	1755	200538
		UPS	proteasome & associates	associated non-Ub enzymes									
DDI1	Protein DDI1 homolog 1	UPS	proteasome & associates	associated non-Ub enzymes	aspartic peptidase		(none noted)	IPR000626, IPR019103	Q8WTU0	414301		396	44124
DDI2	Protein DDI1 homolog 2	UPS	proteasome & associates	associated non-Ub enzymes	aspartic peptidase		(none noted)	IPR000626, IPR019103	Q5TDH0	84301		399	44523
BAG6	Large proline-rich protein BAG6	UPS	proteasome & associates	associated non-Ub enzymes	chaperone		(none noted)	IPR000626, IPR021925	P46379	7917	BAT3 G3	1132	119409
TXNL1	Thioredoxin-like protein 1	UPS	proteasome & associates	associated non-Ub enzymes	thioredoxin-like		(none noted)	IPR010400, IPR036249	O43396	9352	TRP32 TXL TXNL	289	32251
		UPS	proteasome & associates	adaptors									
AKIRIN1	Akirin-1	UPS	proteasome & associates	adaptors	Akirin		(none noted)	IPR024132	Q9H9L7	79647	C1orf108	192	21867
AKIRIN2	Akirin-2	UPS	proteasome & associates	adaptors	Akirin		(none noted)	IPR024132	Q53H80	55122	C6orf166	203	22496
ZFAND2A	AN1-type zinc finger protein 2A	UPS	proteasome & associates	adaptors	AN1	UBZ	(none noted)	IPR000058, IPR035896, UBZ @ 48-88 (unpublished)	Q8N6M9	90637		145	16477
ZFAND2B	AN1-type zinc finger protein 2B	UPS	proteasome & associates	adaptors	AN1	UIM	(none noted)	IPR000058, IPR035896, IPR003903	Q8WV99	130617	AIRAPL	257	28023
ZFAND5	AN1-type zinc finger protein 5	UPS	proteasome & associates	adaptors	AN1	A20	(none noted)	IPR000058, IPR035896, IPR002653	O76080	7763	ZA20D2 ZNF216	213	23132
BAG2	BAG family molecular chaperone regulator 2	UPS	proteasome & associates	adaptors	BAG		(none noted)	IPR003103	O95816	9532		211	23772
SQSTM1	Sequestosome-1	UPS	proteasome & associates	adaptors	PB1	UBA	(none noted)	IPR000270, IPR015940	Q13501	8878	ORCA OSIL	440	47687
UBQLNL	Ubiquilin-like protein	UPS	proteasome & associates	adaptors	UBL	UBL only	(none noted)	IPR000626	Q8IYU4	143630		475	52897
MIDN	Midnolin	UPS	proteasome & associates	adaptors	UBL	UBL only	(none noted)	IPR000626	Q504T8	90007		468	49213
RAD23A	UV excision repair protein RAD23 homolog A	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	P54725	5886		363	39609
RAD23B	UV excision repair protein RAD23 homolog B	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	P54727	5887		409	43171
UBQLN1	Ubiquilin-1	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	Q9UMX0	29979	DA41 PLIC1	589	62519
UBQLN2	Ubiquilin-2	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	Q9UHD9	29978	N4BP4 PLIC2	624	65696
UBQLN3	Ubiquilin-3	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	Q9H347	50613		655	70841
UBQLN4	Ubiquilin-4	UPS	proteasome & associates	adaptors	UBL	with UBA	(none noted)	IPR000626, IPR015940, IPR006636	Q9NRR5	56893	C1orf6 CIP75 UBIN	601	63853
		UPS	proteasome & associates	regulators									
NFE2L1	Endoplasmic reticulum membrane sensor NFE2L1	UPS	proteasome & associates	regulators	transcription factor		(none noted)	IPR008917	Q14494	4779	HBZ17 NRF1 TCF11	772	84704
NFE2L2	Nuclear factor erythroid 2-related factor 2	UPS	proteasome & associates	regulators	transcription factor		(none noted)	IPR008917	Q16236	4780	NRF2	605	67827
NGLY1	Peptide-N(4)-(N-acetyl-beta-glucosaminyl)asparagine amidase	UPS	proteasome & associates	regulators	deglycosylase		(none noted)	IPR006588, IPR018997	Q96IV0	55768	PNG1	654	74390
		UPS	p97 and associates										
		UPS	p97 and associates	p97 itself									
VCP	Transitional endoplasmic reticulum ATPase	UPS	p97 and associates	p97			IPR003338	IPR003593	P55072	7415		806	89322
		UPS	p97 and associates	associated DUBs									
NPLOC4	Nuclear protein localization protein 4 homolog	UPS	p97 and associates	associated DUBs	MPN	UBXL	PMID: 28451587 (UBXL)	IPR037518	Q8TAT6	55666	KIAA1499 NPL4	608	68120
VCPIP1	Deubiquitinating protein VCPIP1	UPS	p97 and associates	associated DUBs	OTU	UBXL	PMID: 28451587 (UBXL)	IPR003323	Q96JH7	80124	KIAA1850 VCIP135	1222	134321
OTUB1	Ubiquitin thioesterase OTUB1	UPS	p97 and associates	associated DUBs	OTU	UBXL	PMID: 28451587 (UBXL)	IPR003323	Q96FW1	55611	OTB1, OTU1	271	31284
OTUD7A	OTU domain-containing protein 7A	UPS	p97 and associates	associated DUBs	OTU	VBM, A20	PMID: 28451587 (VBM)	IPR003323, IPR002653	Q8TE49	161725	C15orf16 CEZANNE2 OTUD7	926	100677
OTUD7B	OTU domain-containing protein 7B	UPS	p97 and associates	associated DUBs	OTU	VBM, A20	PMID: 28451587 (VBM)	IPR003323, IPR002653	Q6GQQ9	56957	ZA20D1	843	92526
ATXN3	Ataxin-3	UPS	p97 and associates	associated DUBs	Josephin	VBM, UIM	PMID: 28451587 (VBM)	IPR006155, IPR003903	P54252	4287	ATX3 MJD MJD1 SCA3	361	41250
		UPS	p97 and associates	associated E3 ligases									
SYVN1	E3 ubiquitin-protein ligase synoviolin	UPS	p97 and associates	associated E3 ligases	RING	VBM	PMID: 28451587 (VBM)	IPR001841	Q86TM6	84447	HRD1 KIAA1810	617	67685
UBE4B	Ubiquitin conjugation factor E4 B	UPS	p97 and associates	associated E3 ligases	RING	VBM	PMID: 28451587 (VBM)	IPR001841	O95155	10277	HDNB1 KIAA0684 UFD2	1302	146185

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
AMFR	E3 ubiquitin-protein ligase AMFR	UPS	p97 and associates	associated E3 ligases	UBOX	VIM	PMID: 28451587 (VIM)	IPR003613	Q9UKV5	267	RNF45	643	72996
RNF31	E3 ubiquitin-protein ligase RNF31	UPS	p97 and associates	associated E3 ligases	RBR	PUB, UBA	IPR018997	IPR044066, IPR015940	Q96EP0	55072	ZIBRA	1072	119652
		UPS	**p97 and associates**	**associated non-Ub enzymes**									
SPRTN	DNA-dependent metalloprotease SPRTN	UPS	p97 and associates	associated non-Ub enzymes	metalloprotease	SHP	PMID: 28451587 (SHP)	IPR006642, IPR006640	Q9H040	83932	C1orf124 DVC1	489	55134
RHBDD1	Rhomboid-related protein 4	UPS	p97 and associates	associated non-Ub enzymes	serine protease	VBM	PMID: 28451587 (VBM)	IPR035952	Q8TEB9	84236	RHBDL4	315	35823
NGLY1	Peptide-N(4)-(N-acetyl-beta-glucosaminyl)asparagine amidase	UPS	p97 and associates	associated non-Ub enzymes	deglycolsylase	PUB	IPR018997	IPR006588	Q96IV0	55768	PNG1	654	74390
PLAA	Phospholipase A-2-activating protein	UPS	p97 and associates	associated non-Ub enzymes	PLA activator	PUL	IPR013535	IPR011989, IPR015155, IPR036322	Q9Y263	9373	PLAP	795	87157
		UPS	**p97 and associates**	**channel protein**									
DERL1	Derlin-1	UPS	p97 and associates	channel proteins	SHP		PMID: 28451587 (SHP)	IPR007599	Q9BUN8	79139	DER1	251	28801
DERL2	Derlin-2	UPS	p97 and associates	channel proteins	SHP		PMID: 28451587 (SHP)	IPR007599	Q9GZP9	51009	DER2 FLANA	239	27567
		UPS	**p97 and associates**	**adaptors**									
UFD1	Ubiquitin recognition factor in ER-associated degradation protein 1	UPS	p97 and associates	adaptors	SHP, UT3		PMID: 28451587 (SHP)	IPR042299	Q92890	7353	UFD1L	307	34500
ASPSCR1	Tether containing UBX domain for GLUT4	UPS	p97 and associates	adaptors	UBX, UBXL, SHP		IPR001012, PMID: 28451587 (UBXL), PMID: 28451587 (SHP)	IPR021569 (TUG UBL)	Q9BZE9	79058	ASPL RCC17 TUG UBXD9 UBXN9	553	60183
UBXN2A	UBX domain-containing protein 2A	UPS	p97 and associates	adaptors	UBX, SHP, SEP		IPR001012, PMID: 28451587 (SHP)	IPR012989	P68543	165324	UBXD4	259	29278
UBXN2B	UBX domain-containing protein 2B	UPS	p97 and associates	adaptors	UBX, SHP, SEP		IPR001012, PMID: 28451587 (SHP)	IPR012989	Q14CS0	137886	[p37]	331	37077
UBXN11	UBX domain-containing protein 11	UPS	p97 and associates	adaptors	UBX, SHP, SEP		IPR001012, PMID: 28451587 (SHP)	IPR012989	Q5T124	91544	SOC UBXD5	520	57373
NSFL1C	NSFL1 cofactor p47	UPS	p97 and associates	adaptors	UBX, SHP, SEP, UBA		IPR001012, PMID: 28451587 (SHP)	IPR012989, IPR009060	Q9UNZ2	55968	UBXN2C [p47]	370	40573
UBXN4	UBX domain-containing protein 4	UPS	p97 and associates	adaptors	UBX, thioredoxin-like		IPR001012	IPR036249	Q92575	23190	KIAA0242 UBXD2 UBXDC1	508	56778
UBXN7	UBX domain-containing protein 7	UPS	p97 and associates	adaptors	UBX, thioredoxin-like, UBA		IPR001012	IPR036249, IPR009060	O94888	26043	KIAA0794 UBXD7	489	54862
FAF1	FAS-associated factor 1	UPS	p97 and associates	adaptors	UBX, thioredoxin-like, UBA		IPR001012	IPR036249, IPR044541	Q9UNN5	11124	UBXD12 UBXN3A	650	73954
FAF2	FAS-associated factor 2	UPS	p97 and associates	adaptors	UBX, thioredoxin-like, UBA		IPR001012	IPR036249, IPR009060	Q96CS3	23197	ETEA KIAA0887 UBXD8 UBXN3B	445	52623
NUB1	NEDD8 ultimate buster 1	UPS	p97 and associates	adaptors	UBX, VBM, UBL, UBA		IPR001012, PMID: 28451587 (VBM)	IPR041207, IPR009060, IPR015940	Q9Y5A7	51667	NYREN18	615	70538
UBXN6	UBX domain-containing protein 6	UPS	p97 and associates	adaptors	UBX, PUB, VIM		IPR001012, IPR018997, PMID: 28451587 (VIM)	(none noted)	Q9BZV1	80700	UBXD1 UBXDC2	441	49754
UBXN1	UBX domain-containing protein 1	UPS	p97 and associates	adaptors	UBX, UBA		IPR001012	IPR015940	Q04323	51035	SAKS1	297	33325
UBXN8	UBX domain-containing protein 8	UPS	p97 and associates	adaptors	UBX		IPR001012	(none noted)	O00124	7993	D8S2298E REP8 UBXD6	270	30541
UBXN10	UBX domain-containing protein 10	UPS	p97 and associates	adaptors	UBX		IPR001012	(none noted)	Q96LJ8	127733	UBXD3	280	30811
ZFAND2B	AN1-type zinc finger protein 2B	UPS	p97 and associates	adaptors	VIM, AN1, UIM		PMID: 28451587 (VIM)	IPR000058, IPR003903	Q8WV99	130617	AIRAPL	257	28023
SELENOS	Selenoprotein S	UPS	p97 and associates	adaptors	VIM		PMID: 28451587 (VIM)		Q9BQE4	55829	SELS VIMP	189	21163
SVIP	Small VCP/p97-interacting protein	UPS	p97 and associates	adaptors	VIM		PMID: 28451587 (VIM)		Q8NHG7	258010		77	8443
ANKZF1	Ankyrin repeat and zinc finger domain-containing protein 1	UPS	p97 and associates	adaptors	VIM, ankyrin repeats		PMID: 28451587 (VIM)	IPR036770	Q9H8Y5	55139	ZNF744	726	80927
		UPS	**ubiquitin and UBL proteins**										
		UPS	**ubiquitin and UBL proteins**	**ubiquitin**									
UBB	Polyubiquitin-B	UPS	ubiquitin and UBL proteins	ubiquitin	polyubiquitin		IPR019956, IPR000626	(none noted)	P0CG47	7314		229	25762
UBC	Polyubiquitin-C	UPS	ubiquitin and UBL proteins	ubiquitin	polyubiquitin		IPR019956, IPR000626	(none noted)	P0CG48	7316		685	77039
RPS27A	Ubiquitin-40S ribosomal protein S27a	UPS	ubiquitin and UBL proteins	ubiquitin	ribosomal ubiquitin fusion		IPR019956, IPR000626	IPR002906	P62979	6233	UBA80 UBCEP1	156	17965
UBA52	Ubiquitin-60S ribosomal protein L40	UPS	ubiquitin and UBL proteins	ubiquitin	ribosomal ubiquitin fusion		IPR019956, IPR000626	IPR001975	P62987	7311	UBCEP2	128	14728
		UPS	**ubiquitin and UBL proteins**	**ubiquitin-like modifier**									
ISG15	Ubiquitin-like protein ISG15	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	ISG15		IPR019956, IPR000626	(none noted)	P05161	9636	G1P2 UCRP	165	17888
ISG15	Ubiquitin-like protein ISG15	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	ISG15		IPR019956, IPR000626	(none noted)	P05161	9636	G1P2 UCRP	165	17888
NEDD8	NEDD8	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	NEDD8		IPR038738, IPR019956, IPR000626	(none noted)	Q15843	4738		81	9072
SUMO1	Small ubiquitin-related modifier 1	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	SUMO		IPR022617, IPR000626	(none noted)	P63165	7341	SMT3C SMT3H3 UBL1	101	11557
SUMO2	Small ubiquitin-related modifier 2	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	SUMO		IPR022617, IPR000626	(none noted)	P61956	6613	SMT3B SMT3H2	95	10871
SUMO3	Small ubiquitin-related modifier 3	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	SUMO		IPR022617, IPR000626	(none noted)	P55854	6612	SMT3A SMT3H1	103	11637
SUMO4	Small ubiquitin-related modifier 4	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	SUMO		IPR022617, IPR000626	(none noted)	Q6EEV6	387082	SMT3H4	95	10653
SUMO1P1	Small ubiquitin-related modifier 5	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	SUMO		IPR022617, IPR000626	(none noted)	G2XKQ0	391257	SUMO5 UBL2 UBL6	101	11526
UFM1	Ubiquitin-fold modifier 1	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	UFM1		IPR005375	(none noted)	P61960	51569	C13orf20	85	9118
URM1	Ubiquitin-related modifier 1	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	URM1		IPR015221	(none noted)	Q9BTM9	81605	C9orf74	101	11380
UBL5	Ubiquitin-like protein 5	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	UBL5		IPR039732, IPR000626	(none noted)	Q9BZL1	59286		73	8547
UBL3	Ubiquitin-like protein 3	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	UBL3		IPR039540, IPR000626	(none noted)	O95164	5412	PNSC1	117	13157
FAU	FAU ubiquitin-like and ribosomal protein S30	UPS	ubiquitin and UBL proteins	ubiquitin-like modifier	FAU		IPR039415, IPR019956, IPR000626	(none noted)	P35544	2197			
		UPS	**ubiquitin and UBL proteins**	**UBL domain**									
UBA2	SUMO-activating enzyme subunit 2	UPS	ubiquitin and UBL proteins	UBL domain	SUMO activation		IPR028077	IPR000594	Q9UBT2	10054	SAE2 UBLE1B	640	71224

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
ELOB	Elongin-B	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	Elongin B	IPR039049, IPR000626	(none noted)	Q15370	6923	TCEB2	118	13133
PRKN	E3 ubiquitin-protein ligase parkin	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	Parkin	IPR000626	IPR044066	O60260	5071	PARK2	465	51641
SHARPIN	Sharpin	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	LUBAC complex	cd01799	IPR001876, IPR031912	Q9H0F6	81858	SIPL1	387	39949
RBCK1	RanBP-type and C3HC4-type zinc finger-containing protein 1	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	LUBAC complex	IPR000626, cd01799	IPR001876, IPR044066	Q9BYM8	10616	C20orf18 RNF54 UBCE7IP3 XAP3 XAP4	510	57572
RING1	E3 ubiquitin-protein ligase RING1	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	Q06587	6015	RNF1	406	42429
RNF2	E3 ubiquitin-protein ligase RING2	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	Q99496	6045	BAP1 DING HIPI3 RING1B	336	37655
BMI1	Polycomb complex protein BMI-1	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	P35226	648	PCGF4 RNF51	326	36949
PCGF1	Polycomb group RING finger protein 1	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	Q9BSM1	84759	NSPC1 RNF68	259	30346
PCGF2	Polycomb group RING finger protein 2	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	P35227	7703	MEL18 RNF110 ZNF144	344	37788
PCGF3	Polycomb group RING finger protein 3	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	Q3KNV8	10336	RNF3 RNF3A	242	28115
PCGF5	Polycomb group RING finger protein 5	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	IPR032443	IPR001841	Q86SE9	84333	RNF159	256	29714
PCGF6	Polycomb group RING finger protein 6	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	RAWUL / polycomb	cd17085	IPR001841	Q9BYE7	84108	MBLR RNF134	350	39047
UHRF1	E3 ubiquitin-protein ligase UHRF1	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	DNA repair	IPR000626	IPR001841	Q96T88	29128	ICBP90 NP95 RNF106	793	89814
UHRF2	E3 ubiquitin-protein ligase UHRF2	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	DNA repair	IPR000626	IPR001841	Q96PU4	115426	NIRF RNF107	802	89985
FBXO7	F-box only protein 7	UPS	ubiquitin and UBL proteins	UBL domain	E3 ligases	F-box	(IPR029071)	IPR001810, IPR021625	Q9Y3I1	25793	FBX7	522	58503
YOD1	Ubiquitin thioesterase OTU1	UPS	ubiquitin and UBL proteins	UBL domain	DUB	OTU	cd17059	IPR003323	Q5VVQ6	55432	DUBA8 HIN7 OTUD2	348	38322
VCPIP1	Deubiquitinating protein VCPIP1	UPS	ubiquitin and UBL proteins	UBL domain	DUB	OTU	cd17059	IPR003323	Q96JH7	80124	KIAA1850 VCIP135	1222	134321
USP14	Ubiquitin carboxyl-terminal hydrolase 14	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	IPR000626, PMID:17597129	IPR028889	P54578	9097	TGT	494	56069
USP48	Ubiquitin carboxyl-terminal hydrolase 48	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	IPR044743, IPR000626, PMID:17597129	IPR028889	Q86UV5	84196	USP31	1035	119032
USP24	Ubiquitin carboxyl-terminal hydrolase 24	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	cd17065, PMID:17597129	IPR028889	Q9UPU5	23358	KIAA1057	2620	294365
USP34	Ubiquitin carboxyl-terminal hydrolase 34	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	Q70CQ2	9736	KIAA0570 KIAA0729	3546	404233
USP40	Ubiquitin carboxyl-terminal hydrolase 40	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	Q9NVE5	55230		1235	140130
USP9X	Probable ubiquitin carboxyl-terminal hydrolase FAF-X	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	Q93008	8239	DFFRX FAM USP9	2554	290463
USP9Y	Probable ubiquitin carboxyl-terminal hydrolase FAF-Y	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	O00507	8287	DFFRY	2555	291077
USP7	Ubiquitin carboxyl-terminal hydrolase 7	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	Q93009	7874	HAUSP	1102	128302
USP47	Ubiquitin carboxyl-terminal hydrolase 47	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with external UBL	PMID:17597129	IPR028889	Q96K76	55031		1375	157311
USP43	Ubiquitin carboxyl-terminal hydrolase 43	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal UBL	PMID:17597129	IPR028889	Q70EL4	124739		1123	122809
USP31	Ubiquitin carboxyl-terminal hydrolase 31	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal UBL	PMID:17597129	IPR028889	Q70CQ4	57478	KIAA1203	1352	146651
USP19	Ubiquitin carboxyl-terminal hydrolase 19	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal UBL	PMID:17597129	IPR028889	O94966	10869	KIAA0891 ZMYND9	1318	145651
USP32	Ubiquitin carboxyl-terminal hydrolase 32	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal and external UBL	PMID:17597129	IPR028889	Q8NFA0	84669	USP10	1604	181656
USP4	Ubiquitin carboxyl-terminal hydrolase 4	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal and external UBL	IPR028135, PMID:17597129	IPR028889	Q13107	7375	UNP UNPH	963	108565
USP11	Ubiquitin carboxyl-terminal hydrolase 11	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal and external UBL	IPR028135, PMID:17597129	IPR028889	P51784	8237	UHX1	963	109817
USP15	Ubiquitin carboxyl-terminal hydrolase 15	UPS	ubiquitin and UBL proteins	UBL domain	DUB	USP with internal and external UBL	IPR028135, PMID:17597129	IPR028889	Q9Y4E8	9958	KIAA0529	981	112419
WDR48	WD repeat-containing protein 48	UPS	ubiquitin and UBL proteins	UBL domain	DUB modulator		cd17041	IPR036322	Q8TAF3	57599	KIAA1449 UAF1	677	76210
RAD23A	UV excision repair protein RAD23 homolog A	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	P54725	5886		363	39609
RAD23B	UV excision repair protein RAD23 homolog B	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	P54727	5887		409	43171
UBQLN1	Ubiquilin-1	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	Q9UMX0	29979	DA41 PLIC1	589	62519
UBQLN2	Ubiquilin-2	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	Q9UHD9	29978	N4BP4 PLIC2	624	65696
UBQLN3	Ubiquilin-3	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	Q9H347	50613		655	70841
UBQLN4	Ubiquilin-4	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940, IPR006636	Q9NRR5	56893	C1orf6 CIP75 UBIN	601	63853
UBAC1	Ubiquitin-associated domain-containing protein 1	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	cd17066	IPR015940, IPR006636	Q9BSL1	10422	GBDR1 KPC2 UBADC1	405	45338
UBL7	Ubiquitin-like protein 7	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR000626	IPR015940	Q96S82	84993	BMSCUBP	380	40510
NUB1	NEDD8 ultimate buster 1	UPS	ubiquitin and UBL proteins	UBL domain	ubiquitin binding	UBA	IPR041207	IPR015940, IPR011990	Q9Y5A7	51667	NYREN18	615	70538
UBQLNL	Ubiquilin-like protein	UPS	ubiquitin and UBL proteins	UBL domain	ubiquilin adjacent		IPR000626	(none noted)	Q8IYU4	143630		475	52897
HERPUD1	Homocysteine-responsive endoplasmic reticulum-resident ubiquitin-like domain member 1 protein	UPS	ubiquitin and UBL proteins	UBL domain	ubiquilin adjacent		IPR000626	IPR039751	Q15011	9709	HERP KIAA0025 MIF1	391	43720
HERPUD2	Homocysteine-responsive endoplasmic reticulum-resident ubiquitin-like domain member 2 protein	UPS	ubiquitin and UBL proteins	UBL domain	ubiquilin adjacent		IPR000626	IPR039751	Q9BSE4	64224		406	45147
BAG1	BAG family molecular chaperone regulator 1	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	co-chaperone	IPR000626	IPR003103	Q99933	573	HAP	345	38779
SACS	Sacsin	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	co-chaperone	IPR000626	IPR001623	Q9NZJ4	26278	KIAA0730	4579	521126
BAG6	Large proline-rich protein BAG6	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	BAG 6 complex	IPR000626	IPR021925	P46379	7917	BAT3 G3	1132	119409
UBL4A	Ubiquitin-like protein 4A	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	BAG 6 complex	IPR044724, IPR019956, IPR000626	IPR041421	P11441	8266	DXS254E GDX UBL4	157	17777
UBL4B	Ubiquitin-like protein 4B	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	similar to UBL4A	IPR000626	IPR041421	Q8N7F7	164153		174	19909
TBCB	Tubulin-folding cofactor B	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	tubulin-associated	IPR045172, IPR000626	IPR000938	Q99426	1155	CG22 CKAP1	244	27326
TBCE	Tubulin-specific chaperone E	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	tubulin-associated	IPR044079, IPR000626	IPR000938	Q15813	6905		527	59346
TBCEL	Tubulin-specific chaperone cofactor E-like protein	UPS	ubiquitin and UBL proteins	UBL domain	chaperones and related	tubulin-associated	IPR000626	IPR032675	Q5QJ74	219899	LRRC35	424	48195
DDI1	Protein DDI1 homolog 1	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	aspartic protease	IPR033882, IPR000626	IPR019103	Q8WTU0	414301		396	44124
DDI2	Protein DDI1 homolog 2	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	aspartic protease	IPR033882, IPR000626	IPR019103	Q5TDH0	84301		399	44523
UBLCP1	Ubiquitin-like domain-containing CTD phosphatase 1	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	proteasome phosphatase	IPR000626	IPR004274	Q8WVY7	134510		318	36805

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
CHUK	Inhibitor of nuclear factor kappa-B kinase subunit alpha	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	kinase	cd17046	IPR000719	O15111	1147	IKKA TCF16	745	84640
IKBKB	Inhibitor of nuclear factor kappa-B kinase subunit beta	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	kinase	IPR000626, cd17046	IPR000719	O14920	3551	IKKB	756	86564
IKBKE	Inhibitor of nuclear factor kappa-B kinase subunit epsilon	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	kinase	IPR041087	IPR000719	Q14164	9641	IKKE IKKI KIAA0151	716	80462
TBK1	Serine/threonine-protein kinase TBK1	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	kinase	IPR041087	IPR000719	Q9UHD2	29110	NAK	729	83642
TECR	Very-long-chain enoyl-CoA reductase	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	enoyl-CoA reductase	cd17124	IPR001104	Q9NZ01	9524	GPSN2 SC2	308	36034
TECRL	Trans-2,3-enoyl-CoA reductase-like	UPS	ubiquitin and UBL proteins	UBL domain	assorted enzymes	enoyl-CoA reductase	cd17125	IPR001104	Q5HYJ1	253017	SRD5A2L2	363	42009
ZFAND4	AN1-type zinc finger protein 4	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	AN1	IPR019956, IPR000626	IPR000058	Q86XD8	93550	ANUBL1	727	80358
COBL	Protein cordon-bleu	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	actin binding	IPR019025	IPR003124	O75128	23242	KIAA0633	1261	135617
COBLL1	Cordon-bleu protein-like 1	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	actin binding	IPR019025	IPR003124	Q53SF7	22837	KIAA0977	1128	123868
TMUB1	Transmembrane and ubiquitin-like domain-containing protein 1	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	transmembrane	IPR000626	IPR040352	Q9BVT8	83590	C7orf21 DULP HOPS	246	26261
TMUB2	Transmembrane and ubiquitin-like domain-containing protein 2	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	transmembrane	IPR000626	IPR040352	Q71RG4	79089		321	33788
ANKRD60	Ankyrin repeat domain-containing protein 60	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	ankyrin repeat	IPR000626	IPR036770	Q9BZ19	140731	C20orf86	345	37630
ANKUB1	Protein ANKUB1	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	ankyrin repeat	IPR000626	IPR036770	A6NFN9	389161	C3orf16	502	56600
TINCR	Ubiquitin domain-containing protein TINCR	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR000626	(none noted)	A0A2R8Y7D0	257000	LINC00036 NCRNA00036 PLAC2	120	13788
MIDN	Midnolin	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR000626	IPR039336	Q504T8	90007		468	49213
UBFD1	Ubiquitin domain-containing protein UBFD1	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR000626	IPR039120	O14562	56061	UBPH	309	33382
IQUB	IQ and ubiquitin-like domain-containing protein	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR000626	IPR037695	Q8NA54	154865		791	92581
UBTD1	Ubiquitin domain-containing protein 1	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR019956, IPR000626	IPR032752	Q9HAC8	80019		227	25938
UBTD2	Ubiquitin domain-containing protein 2	UPS	ubiquitin and UBL proteins	UBL domain	non-enzymes	assorted	IPR000626	IPR032752	Q8WUN7	92181	DCUBP	234	26190
SDE2	Replication stress response regulator SDE2	UPS	ubiquitin and UBL proteins	UBL domain	nucleic acid processes	DNA repair	IPR024974	(none noted)	Q6IQ49	163859	C1orf55	451	49742
NFATC2IP	NFATC2-interacting protein	UPS	ubiquitin and UBL proteins	UBL domain	nucleic acid processes	transcriptional modulator	IPR022617, IPR000626	(none noted)	Q8NCF5	84901	NIP45	419	45817
OASL	2'-5'-oligoadenylate synthase-like protein	UPS	ubiquitin and UBL proteins	UBL domain	nucleic acid processes	double-stranded RNA binding	IPR000626	IPR006116	Q15646	8638	TRIP14	514	59226
SF3A1	Splicing factor 3A subunit 1	UPS	ubiquitin and UBL proteins	UBL domain	nucleic acid processes	pre-mRNA splicing	IPR035563, IPR000626	IPR000061	Q15459	10291	SAP114	793	88886
SNRNP25	U11/U12 small nuclear ribonucleoprotein 25 kDa protein	UPS	ubiquitin and UBL proteins	UBL domain	nucleic acid processes	mRNA splicing	IPR040610, IPR000626	(none noted)	Q9BV90	79622	C16orf33	132	15270
		UPS	**ubiquitin and UBL proteins**	**UBX domain**									
NPLOC4	Nuclear protein localization protein 4 homolog	UPS	ubiquitin and UBL proteins	UBX domain	DUB	MPN	IPR024682	IPR037518, IPR001876	Q8TAT6	55666	KIAA1499 NPL4	608	68120
UBXN1	UBX domain-containing protein 1	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	UBA	IPR001012	IPR009060	Q04323	51035	SAKS1	297	33325
NSFL1C	NSFL1 cofactor p47	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	SEP, UBA	IPR001012	IPR012989, IPR009060	Q9UNZ2	55968	UBXN2C	370	40573
FAF2	FAS-associated factor 2	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	TRX-like, UBA	IPR001012	IPR036249, IPR009060	Q96CS3	23197	ETEA KIAA0887 UBXD8 UBXN3B	445	52623
UBXN7	UBX domain-containing protein 7	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	TRX-like, UBA	IPR001012	IPR036249, IPR009060	O94888	26043	KIAA0794 UBXD7	489	54862
UBXN2A	UBX domain-containing protein 2A	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	SEP	IPR001012	IPR012989	P68543	165324	UBXD4	259	29278
UBXN2B	UBX domain-containing protein 2B	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	SEP	IPR001012	IPR012989	Q14CS0	137886		331	37077
UBXN11	UBX domain-containing protein 11	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	SEP	IPR001012	IPR012989	Q5T124	91544	SOC UBXD5	520	57373
FAF1	FAS-associated factor 1	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	TRX-like	IPR001012	IPR036249, IPR044541	Q9UNN5	11124	UBXD12 UBXN3A	650	73954
UBXN4	UBX domain-containing protein 4	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	TRX-like	IPR001012	IPR036249	Q92575	23190	KIAA0242 UBXD2 UBXDC1	508	56778
ASPSCR1	Tether containing UBX domain for GLUT4	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	UBL	IPR001012	IPR021569	Q9BZE9	79058	ASPL RCC17 TUG UBXD9 UBXN9	553	60183
UBXN6	UBX domain-containing protein 6	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	PUB	IPR001012	IPR018997	Q9BZV1	80700	UBXD1 UBXDC2	441	49754
UBXN8	UBX domain-containing protein 8	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	assorted	IPR001012	IPR017247	O00124	7993	D8S2298E REP8 UBXD6	270	30541
UBXN10	UBX domain-containing protein 10	UPS	ubiquitin and UBL proteins	UBX domain	adaptors	assorted	IPR001012	(none noted)	Q96LJ8	127733	UBXD3	280	30811
		UPS	**E1 activating enzymes**										
		UPS	**E1 activating enzymes**	**ubiquitylation**									
A1S9T UBE1	Ubiquitin-like modifier-activating enzyme 1	UPS	E1 activating enzymes	ubiquitylation			IPR000594	IPR018965	P22314	7317	UBA1	1058	117849
		UPS	**E1 activating enzymes**	**ubiquitylation and ISG15ylation**									
UBA7	Ubiquitin-like modifier-activating enzyme 7	UPS	E1 activating enzymes	ubiquitylation and ISG15ylation			IPR000594	IPR018965	P41226	7318	UBE1L UBE2	1012	111694
		UPS	**E1 activating enzymes**	**ubiquitylation and FAT10ylation**									
MOP4 UBE1L2	Ubiquitin-like modifier-activating enzyme 6, Ubiquitin-activating enzyme 6	UPS	E1 activating enzymes	ubiquitylation and FAT10ylation			IPR000594	IPR018965	A0AVT1	55236	UBA6	1052	117970
		UPS	**E1 activating enzymes**	**NEDDylation**									

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
UBE1C	NEDD8-activating enzyme E1 catalytic subunit	UPS	E1 activating enzymes	NEDDylation			IPR000594, IPR030468	IPR014929	Q8TBC4	9039	UBA3	463	51852
APPBP1	NEDD8-activating enzyme E1 regulatory subunit	UPS	E1 activating enzymes	NEDDylation			IPR000594	(none noted)	Q13564	8883	NAE1	534	60246
		UPS	E1 activating enzymes	SUMOylation									
AOS1 SUA1 UBLE1A	SUMO-activating enzyme subunit 1	UPS	E1 activating enzymes	SUMOylation			IPR000594	(none noted)	Q9UBE0	10055	SAE1	346	38450
SAE2 UBLE1B	SUMO-activating enzyme subunit 2	UPS	E1 activating enzymes	SUMOylation			IPR000594	IPR028077, IPR032426	Q9UBT2	10054	UBA2	640	71224
		UPS	E1 activating enzymes	UFMylation									
UBE1DC1	Ubiquitin-like modifier-activating enzyme 5, Ubiquitin-activating enzyme 5	UPS	E1 activating enzymes	UFMylation			IPR000594	(none noted)	Q9GZZ9	79876	UBA5	404	44863
		UPS	E1 activating enzymes	URMylation									
MOCS3	Adenylyltransferase and sulfurtransferase MOCS3	UPS	E1 activating enzymes	URMylation			IPR000594	IPR001763	O95396	27304	UBA4	460	49669
		UPS	E2 conjugating enzymes										
		UPS	E2 conjugating enzymes	ubiquitylation									
UBE2A	Ubiquitin-conjugating enzyme E2 A	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P49459	7319	RAD6A	152	17315
UBE2B	Ubiquitin-conjugating enzyme E2 B	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P63146	7320	RAD6B	152	17312
UBE2D1	Ubiquitin-conjugating enzyme E2 D1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P51668	7321	SFT UBC5A UBCH5 UBCH5A	147	16602
UBE2D2	Ubiquitin-conjugating enzyme E2 D2	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P62837	7322	PUBC1 UBC4 UBC5B UBCH4 UBCH5B	147	16735
UBE2D3	Ubiquitin-conjugating enzyme E2 D3	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P61077	7323	UBC5C UBCH5C	147	16687
UBE2D4	Ubiquitin-conjugating enzyme E2 D4	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	Q9Y2X8	51619	UBCH5D	147	16649
UBE2L3	Ubiquitin-conjugating enzyme E2 L3	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P68036	7332	UBCE7 UBCH7	154	17862
UBE2L5	Ubiquitin-conjugating enzyme E2 L5	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	A0A1B0GUS4	171222		154	17875
UBE2N	Ubiquitin-conjugating enzyme E2 N	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P61088	7334	BLU	152	17138
UBE2W	Ubiquitin-conjugating enzyme E2 W	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	Q96B02	55284	UBC16	151	17331
UBE2G1	Ubiquitin-conjugating enzyme E2 G1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P62253	7326	UBE2G	170	19509
UBE2G2	Ubiquitin-conjugating enzyme E2 G2	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	P60604	7327	UBC7	165	18566
UBE2QL1	Ubiquitin-conjugating enzyme E2Q-like protein 1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain only		IPR000608	(none noted)	A1L167	134111		161	18338
UBE2C	Ubiquitin-conjugating enzyme E2 C	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & N-terminal extension		IPR000608	(none noted)	O00762	11065	UBCH10	179	19652
UBE2E1	Ubiquitin-conjugating enzyme E2 E1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & N-terminal extension		IPR000608	(none noted)	P51965	7324	UBCH6	193	21404
UBE2E3	Ubiquitin-conjugating enzyme E2 E3	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & N-terminal extension		IPR000608	(none noted)	Q969T4	10477	UBCE4 UBCH9	207	22913
UBE2H	Ubiquitin-conjugating enzyme E2 H	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	P62256	7328		183	20655
UBE2S	Ubiquitin-conjugating enzyme E2 S	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	Q16763	27338	E2EPF	222	23845
UBE2T	Ubiquitin-conjugating enzyme E2 T	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	Q9NPD8	29089		197	22521
UBE2U	Ubiquitin-conjugating enzyme E2 U	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	Q5VVX9	148581		321	37741
CDC34	Ubiquitin-conjugating enzyme E2 R1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	P49427	997	UBCH3 UBE2R1	236	26737
UBE2R2	Ubiquitin-conjugating enzyme E2 R2	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & C-terminal extension		IPR000608	(none noted)	Q712K3	54926	CDC34B UBC3B	238	27166
UBE2Q1	Ubiquitin-conjugating enzyme E2 Q1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & RWD-like domain		IPR000608	RWD-like by analogy with Hs UBE2Q2	Q7Z7E8	55585	NICE5 UBE2Q	422	46127
UBE2Q2	Ubiquitin-conjugating enzyme E2 Q2	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & RWD-like domain		IPR000608	RWD-like (https://doi.org/10.1560/5BRA-FGYK-TU1Q-0XA8)	Q8WVN8	92912		375	42818
UBE2J1	Ubiquitin-conjugating enzyme E2 J1	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & transmembrane domain		IPR000608	(none noted)	Q9Y385	51465	NCUBE1	318	35199
UBE2J2	Ubiquitin-conjugating enzyme E2 J2	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & transmembrane domain		IPR000608	(none noted)	Q8N2K1	118424	NCUBE2	259	28898
UBE2K	Ubiquitin-conjugating enzyme E2 K	UPS	E2 conjugating enzymes	ubiquitylation	UBC domain & UBA domain		IPR000608	(none noted)	P61086	3093	HIP2 LIG	200	22407
BIRC6	Baculoviral IAP repeat-containing protein 6	UPS	E2 conjugating enzymes	ubiquitylation	E2-E3 chimera		IPR000608	(none noted)	Q9NR09	57448	KIAA1289	4857	530269

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
UBE2O	(E3-independent) E2 ubiquitin-conjugating enzyme	UPS	E2 conjugating enzymes	ubiquitylation	E2-E3 chimera		IPR000608	(none noted)	Q9C0C9	63893	KIAA1734	1292	141293
		UPS	**E2 conjugating enzymes**	**ubiquitylation and ISG15ylation**									
UBE2L6	Ubiquitin/ISG15-conjugating enzyme E2 L6	UPS	E2 conjugating enzymes	ubiquitylation and ISG15ylation	UBC domain only		IPR000608	(none noted)	O14933	9246	UBCH8	153	17769
UBE2E2	Ubiquitin-conjugating enzyme E2 E2	UPS	E2 conjugating enzymes	ubiquitylation and ISG15ylation	UBC domain & N-terminal extension		IPR000608	(none noted)	Q96LR5	7325	UBCH8	201	22255
		UPS	**E2 conjugating enzymes**	**FAT10ylation**									
UBE2Z	Ubiquitin-conjugating enzyme E2 Z	UPS	E2 conjugating enzymes	FAT10ylation	UBC domain & N-terminal and C-terminal extensions		IPR000608	(none noted)	Q9H832	65264		354	38210
		UPS	**E2 conjugating enzymes**	**NEDDylation**									
UBE2F	NEDD8-conjugating enzyme UBE2F	UPS	E2 conjugating enzymes	NEDDylation			IPR000608	(none noted)	Q969M7	140739	NCE2	185	21077
UBE2M	NEDD8-conjugating enzyme Ubc12	UPS	E2 conjugating enzymes	NEDDylation			IPR000608	(none noted)	P61081	9040	UBC12	183	20900
		UPS	**E2 conjugating enzymes**	**SUMOylation**									
UBE2I	SUMO-conjugating enzyme UBC9	UPS	E2 conjugating enzymes	SUMOylation			IPR000608	(none noted)	P63279	7329	UBC9 UBCE9	158	18007
		UPS	**E2 conjugating enzymes**	**UFMylation**									
UFC1	Ubiquitin-fold modifier-conjugating enzyme 1	UPS	E2 conjugating enzymes	UFMylation			IPR014806	(none noted)	Q9Y3C8	51506		167	19458
		UPS	**E3 ligases**										
		UPS	**E3 ligase**	**APC**									
ANAPC2	Anaphase-promoting complex subunit 2	UPS	E3 ligase	APC	subunit	Cullin	(none noted)	IPR016158	Q9UJX6	29882	APC2 KIAA1406	822	93828
ANAPC11	Anaphase-promoting complex subunit 11	UPS	E3 ligase	APC	subunit	RING	(none noted)	IPR001841	Q9NYG5	51529		84	9841
ANAPC1	Anaphase-promoting complex subunit 1	UPS	E3 ligase	APC	subunit	Armadillo	(none noted)	IPR011989	Q9H1A4	64682	TSG24	1944	216500
ANAPC10	Anaphase-promoting complex subunit 10	UPS	E3 ligase	APC	subunit	DOC	(none noted)	IPR004939	Q9UM13	10393	APC10	185	21252
CDC16	Cell division cycle protein 16 homolog	UPS	E3 ligase	APC	subunit	TPR	(none noted)	IPR011990, IPR019734	Q13042	8881	ANAPC6	620	71656
CDC23	Cell division cycle protein 23 homolog	UPS	E3 ligase	APC	subunit	TPR	(none noted)	IPR011990, IPR019734	Q9UJX2	8697	ANAPC8	597	68834
CDC27	Cell division cycle protein 27 homolog	UPS	E3 ligase	APC	subunit	TPR	(none noted)	IPR011990, IPR019734	P30260	996	ANAPC3 D0S1430E D17S978E	824	91867
ANAPC5	Anaphase-promoting complex subunit 5	UPS	E3 ligase	APC	subunit	TPR	(none noted)	IPR011990, IPR019734	Q9UJX4	51433	APC5	755	85077
ANAPC7	Anaphase-promoting complex subunit 7	UPS	E3 ligase	APC	subunit	TPR	(none noted)	IPR011990, IPR019734	Q9UJX3	51434	APC7	565	63133
ANAPC4	Anaphase-promoting complex subunit 4	UPS	E3 ligase	APC	subunit	WD40	(none noted)	IPR015943, IPR036322	Q9UJX5	29945	APC4	808	92116
CDC26	Anaphase-promoting complex subunit CDC26	UPS	E3 ligase	APC	subunit	assorted	(none noted)	(none noted)	Q8NHZ8	246184	ANAPC12 C9orf17	85	9777
ANAPC13	Anaphase-promoting complex subunit 13	UPS	E3 ligase	APC	subunit	assorted	(none noted)	(none noted)	Q9BS18	25847		74	8521
ANAPC15	Anaphase-promoting complex subunit 15	UPS	E3 ligase	APC	subunit	assorted	(none noted)	(none noted)	P60006	25906	C11orf51	121	14281
ANAPC16	Anaphase-promoting complex subunit 16	UPS	E3 ligase	APC	subunit	assorted	(none noted)	(none noted)	Q96DE5	119504	C10orf104 CENP-27	110	11667
CDC20	Cell division cycle protein 20 homolog	UPS	E3 ligase	APC	activator	WD40	(none noted)	IPR015943, IPR036322	Q12834	991		499	54723
CDC20B	Cell division cycle protein 20 homolog B	UPS	E3 ligase	APC	activator	WD40	(none noted)	IPR015943, IPR036322	Q86Y33	166979		519	57335
FZR1	Fizzy-related protein homolog	UPS	E3 ligase	APC	activator	WD40	(none noted)	IPR015943, IPR036322	Q9UM11	51343	CDH1 FYR FZR KIAA1242	496	55179
		UPS	**E3 ligase**	**CTLH complex**									
MAEA	E3 ubiquitin-protein transferase MAEA	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH, RING	IPR024964	IPR006594, IPR044063	Q7L5Y9	10296	EMP	396	45287
RMND5B	E3 ubiquitin-protein transferase RMND5B	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH, RING	IPR024964	IPR006594, IPR044063	Q96G75	64777		393	44414
RMND5A	E3 ubiquitin-protein transferase RMND5A	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH, RING	IPR024964	IPR006594, IPR044063	Q9H871	64795		391	43993
RANBP10	Ran-binding protein 10	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH, SPRY	IPR024964	IPR006594, IPR003877	Q6VN20	57610	KIAA1464	620	67257
RANBP9	Ran-binding protein 9	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH, SPRY	IPR024964	IPR006594, IPR003877	Q96S59	10048	RANBPM	729	77847
GID8	Glucose-induced degradation protein 8 homolog	UPS	E3 ligase	CTLH complex	subunit	CRA, LisH	IPR024964	IPR006594	Q9NWU2	54994	C20orf11 TWA1	228	26749
WDR26	WD repeat-containing protein 26	UPS	E3 ligase	CTLH complex	subunit	LisH, WD40	(none noted)	IPR006594, IPR015943, IPR036322	Q9H7D7	80232	CDW2 MIP2	661	72124
MKLN1	Muskelin	UPS	E3 ligase	CTLH complex	subunit	LisH, KELCH	(none noted)	IPR006594, IPR010565, IPR015915	Q9UL63	4289		735	84768
CFAP410	Cilia- and flagella-associated protein 410	UPS	E3 ligase	CTLH complex	subunit	LRR	(none noted)	IPR032675	O43822	755	C21orf2 LRRC76	256	28340
ARMC8	Armadillo repeat-containing protein 8	UPS	E3 ligase	CTLH complex	subunit	Armadillo-like	(none noted)	IPR011989	Q8IUR7	25852		673	75509
GID4	Glucose-induced degradation protein 4 homolog	UPS	E3 ligase	CTLH complex	subunit		(none noted)	(none noted)	Q8IVV7	79018	C17orf39 VID24	300	33514
YPEL5	Protein yippee-like 5	UPS	E3 ligase	CTLH complex	subunit		(none noted)	IPR004910	P62699	51646		121	13842
		UPS	**E3 ligase**	**HECT**									
ITCH	E3 ubiquitin-protein ligase Itchy homolog	UPS	E3 ligase	HECT	WW & C2	ubiquitination	IPR000569	IPR036020, IPR035892	Q96J02	83737		903	102803
SMURF1	E3 ubiquitin-protein ligase SMURF1	UPS	E3 ligase	HECT	WW & C2	ubiquitination	IPR000569	IPR036020, IPR035892	Q9HCE7	57154	KIAA1625	757	86114
SMURF2	E3 ubiquitin-protein ligase SMURF2	UPS	E3 ligase	HECT	WW & C2	ubiquitination	IPR000569	IPR036020, IPR035892	Q9HAU4	64750		748	86196

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NEDD4	E3 ubiquitin-protein ligase NEDD4	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	P46934	4734	KIAA0093 NEDD4-1	1319	149114
NEDD4L	E3 ubiquitin-protein ligase NEDD4-like	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	Q96PU5	23327	KIAA0439 NEDL3	975	111932
WWP1	NEDD4-like E3 ubiquitin-protein ligase WWP1	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	Q9H0M0	11059		922	105202
WWP2	NEDD4-like E3 ubiquitin-protein ligase WWP2	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	O00308	11060		870	98912
HECW1	E3 ubiquitin-protein ligase HECW1	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	Q76N89	23072	KIAA0322 NEDL1	1606	179554
HECW2	E3 ubiquitin-protein ligase HECW2	UPS	E3 ligase	HECT	WW & C2	NEDDylation	IPR000569	IPR036020, IPR035892	Q9P2P5	57520	KIAA1301 NEDL2	1572	175769
HACE1	E3 ubiquitin-protein ligase HACE1	UPS	E3 ligase	HECT	ankyrin repeats		IPR000569	IPR036770	Q8IYU2	57531	KIAA1320	909	102342
HECTD1	E3 ubiquitin-protein ligase HECTD1	UPS	E3 ligase	HECT	Armadillo-like, ankyrin repeats		IPR000569	IPR011989, IPR036770	Q9ULT8	25831	KIAA1131	2610	289368
TRIP12	E3 ubiquitin-protein ligase TRIP12	UPS	E3 ligase	HECT	Armadillo-like, WW		IPR000569	IPR011989	Q14669	9320	KIAA0045 ULF	1992	220434
HUWE1	E3 ubiquitin-protein ligase HUWE1	UPS	E3 ligase	HECT	Armadillo-like, WW	UBA	IPR000569	IPR016024, IPR009060	Q7Z6Z7	10075	KIAA0312 KIAA1578 UREB1	4374	481891
HERC1	Probable E3 ubiquitin-protein ligase HERC1	UPS	E3 ligase	HECT	RCC1	WD40	IPR000569	IPR009091, IPR015943, IPR036322	Q15751	8925		4861	532228
HERC2	E3 ubiquitin-protein ligase HERC2	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	O95714	8924		4834	527228
HERC3	Probable E3 ubiquitin-protein ligase HERC3	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	Q15034	8916	KIAA0032	1050	117188
HERC4	Probable E3 ubiquitin-protein ligase HERC4	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	Q5GLZ8	26091	KIAA1593	1057	118563
HERC5	E3 ISG15--protein ligase HERC5	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	Q9UII4	51191	CEB1 CEBP1	1024	116852
HERC6	Probable E3 ubiquitin-protein ligase HERC6	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	Q8IVU3	55008		1022	115126
UBR5	E3 ubiquitin-protein ligase UBR5	UPS	E3 ligase	HECT	RCC1		IPR000569	IPR009091	O95071	51366	EDD EDD1 HYD KIAA0896	2799	309352
G2E3	G2/M phase-specific E3 ubiquitin-protein ligase	UPS	E3 ligase	HECT	PHD-type ZnF		IPR000569	IPR001965	Q7L622	55632	KIAA1333	706	80504
HECTD4	Probable E3 ubiquitin-protein ligase HECTD4	UPS	E3 ligase	HECT	SPRY		IPR000569	IPR035781	Q9Y4D8	283450	C12orf51 KIAA0614	3996	439344
UBE3B	Ubiquitin-protein ligase E3B	UPS	E3 ligase	HECT	IQ motif		IPR000569	IPR000048	Q7Z3V4	89910		1068	123098
UBE3C	Ubiquitin-protein ligase E3C	UPS	E3 ligase	HECT	IQ motif		IPR000569	IPR000048	Q15386	9690	KIAA0010 KIAA10	1083	123923
AREL1	Apoptosis-resistant E3 ubiquitin protein ligase 1	UPS	E3 ligase	HECT	assorted		IPR000569	IPR017868	O15033	9870	KIAA0317	823	94223
HECTD2	Probable E3 ubiquitin-protein ligase HECTD2	UPS	E3 ligase	HECT	assorted		IPR000569	(none noted)	Q5U5R9	143279		776	88122
HECTD3	E3 ubiquitin-protein ligase HECTD3	UPS	E3 ligase	HECT	assorted		IPR000569	(none noted)	Q5T447	79654		861	97113
UBE3A	Ubiquitin-protein ligase E3A	UPS	E3 ligase	HECT	assorted		IPR000569	(none noted)	Q05086	7337	E6AP EPVE6AP HPVE6A	875	100688
ENTREP1	Endosomal transmembrane epsin interactor 1	UPS	E3 ligase	HECT activator	ITCH-specific		(none noted)	(none noted)	Q15884	9413	C9orf61 FAM189A2 X123	450	49703
NDFIP1	NEDD4 family-interacting protein 1	UPS	E3 ligase	HECT activator			(none noted)	(none noted)	Q9BT67	80762	N4WBP5	221	24899
NDFIP2	NEDD4 family-interacting protein 2	UPS	E3 ligase	HECT activator			(none noted)	(none noted)	Q9NV92	54602	KIAA1165 N4WBP5A	336	36390
ARRDC1	Arrestin domain-containing protein 1	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	Q8N5I2	92714		433	45981
ARRDC2	Arrestin domain-containing protein 2	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	Q8TBH0	27106		407	44379
ARRDC3	Arrestin domain-containing protein 3	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	Q96B67	57561	KIAA1376	414	46395
ARRDC4	Arrestin domain-containing protein 4	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	Q8NCT1	91947		418	45479
ARRDC5	Arrestin domain-containing protein 5	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	A6NEK1	645432		342	38383
TXNIP	Thioredoxin-interacting protein	UPS	E3 ligase	HECT adaptor			IPR011021, IPR011022	(none noted)	Q9H3M7	10628	VDUP1	391	43661
		UPS	**E3 ligase**	**CRL family**									
RBX1	E3 ubiquitin-protein ligase RBX1	UPS	E3 ligase	CRL family	RBX RING		IPR001841	(none noted)	P62877	9978	RNF75 ROC1	108	12274
RNF7	RING-box protein 2	UPS	E3 ligase	CRL family	RBX RING		IPR001841	(none noted)	Q9UBF6	9616	RBX2 ROC2 SAG	113	12683
CUL1	Cullin-1	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q13616	8454		776	89679
CUL2	Cullin-2	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q13617	8453		745	86983
CUL3	Cullin-3	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q13618	8452	KIAA0617	768	88930
CUL4A	Cullin-4A	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q13619	8451		759	87680
CUL5	Cullin-5	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q93034	8065	VACM1	780	90955
CUL4B	Cullin-4B	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR016159, IPR001373	(none noted)	Q13620	8450	KIAA0695	913	103982
CUL7	Cullin-7	UPS	E3 ligase	CRL family	Cullin		IPR016158, IPR036317, IPR001373	(none noted)	Q14999	9820	KIAA0076	1698	191161
CUL9	Cullin-9	UPS	E3 ligase	CRL family	Cullin	Armadillo-like, RING	IPR016158, IPR036317, IPR001373	IPR011989, IPR001841	Q8IWT3	23113	H7AP1 KIAA0708 PARC	2517	281229
ANAPC2	Anaphase-promoting complex subunit 2	UPS	E3 ligase	CRL family	Cullin	APC	IPR016158, IPR036317, IPR001373	(none noted)	Q9UJX6	29882	APC2 KIAA1406	822	93828
CACUL1	CDK2-associated and cullin domain-containing protein 1	UPS	E3 ligase	CRL family	Cullin		IPR016159, IPR001373	(none noted)	Q86Y37	143384	C10orf46 CAC1	369	41064
CAND1	Cullin-associated NEDD8-dissociated protein 1	UPS	E3 ligase	CRL family	CRL regulator	F-box exchange factor	PMID: 23453757	IPR011989	Q86VP6	55832	KIAA0829 TIP120 TIP120A	1230	136376
CAND2	Cullin-associated NEDD8-dissociated protein 2	UPS	E3 ligase	CRL family	CRL regulator	F-box exchange factor	by analogy with CAND1	IPR011989	O75155	23066	KIAA0667 TIP120B	1236	135256
GLMN	Glomulin	UPS	E3 ligase	CRL family	CRL regulator	inhibitor	PMID: 22748924	(none noted)	Q92990	11146	FAP48 FAP68 VMGLOM	594	68208
COMMD1	COMM domain-containing protein 1	UPS	E3 ligase	CRL family	CRL regulator	CAND1 modulator	PMID: 21778237	IPR017920	Q8N668	150684	C2orf5 MURR1	190	21178

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
SKP1	S-phase kinase-associated protein 1	UPS	E3 ligase	CRL family	CRL adaptor	Skp1	IPR016072, IPR016073	(none noted)	P63208	6500	EMC19 OCP2 SKP1A TCEB1L	163	18658
ELOB	Elongin-B	UPS	E3 ligase	CRL family	CRL adaptor	Elongin BC	(none noted)	IPR000626	Q15370	6923	TCEB2	118	13133
ELOC	Elongin-C	UPS	E3 ligase	CRL family	CRL adaptor	Elongin BC	IPR016073	(none noted)	Q15369	6921	TCEB1	112	12473
DDB1	DNA damage-binding protein 1	UPS	E3 ligase	CRL family	CRL adaptor	DDB1	IPR004871, IPR018846	IPR015943, IPR036322	Q16531	1642	XAP1	1140	126968
SF3B3	Splicing factor 3B subunit 3	UPS	E3 ligase	CRL family	CRL adaptor	DDB1	IPR004871, IPR018846	IPR015943, IPR036322	Q15393	23450	KIAA0017 SAP130	1217	135577
CPSF1	Cleavage and polyadenylation specificity factor subunit 1	UPS	E3 ligase	CRL family	CRL adaptor	DDB1	IPR004871, IPR018846	IPR015943	Q10570	29894	CPSF160	1443	160884
FBXL2	F-box/LRR-repeat protein 2	UPS	E3 ligase	CRL family	F-box	LRR	IPR001810	IPR032675	Q9UKC9	25827	FBL2 FBL3	423	47062
FBXL3	F-box/LRR-repeat protein 3	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UKT7	26224	FBL3A FBXL3A	428	48707
FBXL6	F-box/LRR-repeat protein 6	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q8N531	26233	FBL6	539	58558
FBXL7	F-box/LRR-repeat protein 7	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UJT9	23194	FBL6 FBL7 KIAA0840	491	54575
FBXL8	F-box/LRR-repeat protein 8	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q96CD0	55336	FBL8	374	40516
FBXL12	F-box/LRR-repeat protein 12	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9NXK8	54850	FBL12	326	37026
FBXL14	F-box/LRR-repeat protein 14	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q8N1E6	144699	FBL14	418	45886
FBXL15	F-box/LRR-repeat protein 15	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9H469	79176	FBXO37	300	32998
FBXL16	F-box/LRR-repeat protein 16	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047	IPR032675	Q8N461	146330	C16orf22 FBL16	479	51658
FBXL20	F-box/LRR-repeat protein 20	UPS	E3 ligase	CRL family	F-box	LRR	IPR001810	IPR032675	Q96IG2	84961	FBL2	436	48423
FBXL21P	Putative F-box/LRR-repeat protein 21	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UKT6	26223	FBL21 FBL3 FBXL21 FBXL3B FBXL3P	434	49152
FBXO39	F-box only protein 39	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q8N4B4	162517	FBX39	442	52646
SKP2	S-phase kinase-associated protein 2	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q13309	6502	FBXL1	424	47761
FBXO33	F-box only protein 33	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q7Z6M2	254170	FBX33	555	62630
FBXL17	F-box/LRR-repeat protein 17	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UF56	64839	FBL17 FBX13 FBXO13	701	75695
FBXL18	F-box/LRR-repeat protein 18	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q96ME1	80028	FBL18	805	88341
FBXL4	F-box/LRR-repeat protein 4	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UKA2	26235	FBL4 FBL5	621	70097
FBXL5	F-box/LRR-repeat protein 5	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q9UKA1	26234	FBL4 FBL5 FLR1	691	78555
FBXL13	Dynein regulatory complex subunit 6	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q8NEE6	222235	DRC6 FBL13	735	83924
FBXO41	F-box only protein 41	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q8TF61	150726	FBX41 KIAA1940	875	94496
FBXO38	F-box only protein 38	UPS	E3 ligase	CRL family	F-box	LRR	IPR036047, IPR001810	IPR032675	Q6PIJ6	81545		1188	133944
FBXL19	F-box/LRR-repeat protein 19	UPS	E3 ligase	CRL family	F-box	LRR with PHD-type ZnF	IPR001810	IPR032675, IPR001965	Q6PCT2	54620	FBL19	694	75707
KDM2A	Lysine-specific demethylase 2A	UPS	E3 ligase	CRL family	F-box	LRR with PHD-type ZnF	IPR001810	IPR032675, IPR001965	Q9Y2K7	22992	CXXC8 FBL11 FBL7 FBXL11 JHDM1A KIAA1004	1162	132793
KDM2B	Lysine-specific demethylase 2B	UPS	E3 ligase	CRL family	F-box	LRR with PHD-type ZnF	IPR001810	IPR032675, IPR001965	Q8NHM5	84678	CXXC2 FBL10 FBXL10 JHDM1B NDY1 PCCX2	1336	152615
FBXW4	F-box/WD repeat-containing protein 4	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	P57775	6468	FBW4 SHFM3	412	46337
FBXW2	F-box/WD repeat-containing protein 2	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q9UKT8	26190	FBW2 FWD2	454	51512
FBXW9	F-box/WD repeat-containing protein 9	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q5XUX1	84261	FBW9	458	50760
FBXW12	F-box/WD repeat-containing protein 12	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943	Q6X9E4	285231	FBW12 FBXO12 FBXO35	464	53056
FBXW11	F-box/WD repeat-containing protein 11	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q9UKB1	23291	BTRCP2 FBW1B FBXW1B KIAA0696	542	62091
FBXW7	F-box/WD repeat-containing protein 7	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q969H0	55294	FBW7 FBX30 SEL10	707	79663
BTRC	F-box/WD repeat-containing protein 1A	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q9Y297	8945	BTRCP FBW1A FBXW1A	605	68867
FBXW5	F-box/WD repeat-containing protein 5	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943, IPR036322	Q969U6	54461	FBW5	566	63922
FBXW8	F-box/WD repeat-containing protein 8	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047, IPR001810	IPR015943	Q8N3Y1	26259	FBW6 FBW8 FBX29 FBXO29 FBXW6	598	67394
CDRT1	F-box and WD repeat domain containing protein 10B	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047	IPR015943, IPR036322	O95170	374286	C17orf1 C17orf1A HREP	752	85370
FBXW10	F-box/WD repeat-containing protein 10	UPS	E3 ligase	CRL family	F-box	WD40	IPR036047	IPR015943, IPR036322	Q5XX13	10517		1052	119846
FBXO2	F-box only protein 2	UPS	E3 ligase	CRL family	F-box	FBA	IPR036047, IPR001810	IPR007397	Q9UK22	26232	FBX2	296	33328
FBXO6	F-box only protein 6	UPS	E3 ligase	CRL family	F-box	FBA	IPR036047, IPR001810	IPR007397	Q9NRD1	26270	FBG2 FBS2 FBX6	293	33933
FBXO17	F-box only protein 17	UPS	E3 ligase	CRL family	F-box	FBA	IPR036047, IPR001810	IPR007397	Q96EF6	115290	FBG4 FBX17 FBX26 FBXO26	278	31479
FBXO27	F-box only protein 27	UPS	E3 ligase	CRL family	F-box	FBA	IPR036047, IPR001810	IPR007397	Q8NI29	126433	FBG5 FBX27	283	31623
FBXO44	F-box only protein 44	UPS	E3 ligase	CRL family	F-box	FBA	IPR036047, IPR001810	IPR007397	Q9H4M3	93611	FBG3 FBX30 FBX44 FBX6A FBXO6A	255	29747
TMEM183A	Transmembrane protein 183A	UPS	E3 ligase	CRL family	F-box	transmembrane	IPR036047	(none noted)	Q8IXX5	92703	C1orf37	376	42826
TMEM183B	Putative transmembrane protein 183BP	UPS	E3 ligase	CRL family	F-box	transmembrane	IPR036047	(none noted)	Q1AE95	653659	C1orf37-dup	376	42940
FBXO7	F-box only protein 7	UPS	E3 ligase	CRL family	F-box	PI31, UBL	IPR036047, IPR001810	IPR021625	Q9Y3I1	25793	FBX7	522	58503
FBXO42	F-box only protein 42	UPS	E3 ligase	CRL family	F-box	KELCH	IPR036047, IPR001810	IPR015915	Q6P3S6	54455	FBX42 JFK KIAA1332	717	77839
FBXO45	F-box/SPRY domain-containing protein 1	UPS	E3 ligase	CRL family	F-box	SPRY	IPR036047, IPR001810	IPR003877	P0C2W1	200933	FBX45	286	30633
FBXO24	F-box only protein 24	UPS	E3 ligase	CRL family	F-box	RCC1	IPR036047, IPR001810	IPR009091	O75426	26261	FBX24	580	64889
FBXO30	F-box only protein 30	UPS	E3 ligase	CRL family	F-box	TRAF-type ZnF	IPR036047, IPR001810	IPR001293	Q8TB52	84085	FBX30	745	82304
FBXO40	F-box only protein 40	UPS	E3 ligase	CRL family	F-box	TRAF-type ZnF	IPR036047, IPR001810	IPR001293	Q9UH90	51725	FBX40 KIAA1195	709	79782
FBXO11	F-box only protein 11	UPS	E3 ligase	CRL family	F-box	CASH, UBR-type ZnF	IPR036047, IPR001810	IPR003126, IPR006633	Q86XK2	80204	FBX11 PRMT9 VIT1	927	103585
FBXO10	F-box only protein 10	UPS	E3 ligase	CRL family	F-box	CASH	IPR036047, IPR001810	IPR006633	Q9UK96	26267	FBX10 PRMT11	956	105195
CCNF	Cyclin-F	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR011990, IPR013763	P41002	899	FBX1 FBXO1	786	87640
ECT2L	Epithelial cell-transforming sequence 2 oncogene-like	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR000219	Q008S8	345930	C6orf91 LFDH	904	104880
ELOA	Elongin-A	UPS	E3 ligase	CRL family	F-box	assorted	IPR001810	IPR003617	Q14241	6924	TCEB3	798	89909

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
FBH1	F-box DNA helicase 1	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR027417	Q8NFZ0	84893	FBX18 FBXO18	1043	117686
FBXO3	F-box only protein 3	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR018958, IPR007474	Q9UK99	26273	FBX3	471	54561
FBXO4	F-box only protein 4	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR027417	Q9UKT5	26272	FBX4	387	44136
FBXO5	F-box only protein 5	UPS	E3 ligase	CRL family	F-box	assorted	IPR001810	IPR044064	Q9UKT4	26271	EMI1 FBX5	447	50146
FBXO8	F-box only protein 8	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR000904	Q9NRD0	26269	FBS FBX8	319	37068
FBXO9	F-box only protein 9	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR036181	Q9UK97	26268	FBX9 VCIA1	447	52329
FBXO21	F-box only protein 21	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047	IPR032698, IPR011722	O94952	23014	FBX21 KIAA0875	628	72270
FBXO22	F-box only protein 22	UPS	E3 ligase	CRL family	F-box	assorted	IPR036047, IPR001810	IPR019494	Q8NEZ5	26263	FBX22	403	44508
FBXO43	F-box only protein 43	UPS	E3 ligase	CRL family	F-box	assorted	F-box: 509-540 (see FBXO5)	IPR044064	Q4G163	286151	EMI2	708	78402
FBXO48	F-box only protein 48	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q5FWF7	554251	FBX48	155	18241
FBXO36	F-box only protein 36	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q8NEA4	130888	FBX36	188	22105
FBXL22	F-box and leucine-rich protein 22	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q6P050	283807		247	27269
FBXO16	F-box only protein 16	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q8IX29	157574	FBX16	292	34588
FBXO28	F-box only protein 28	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q9NVF7	23219	CENP-30 KIAA0483	368	41149
FBXO25	F-box only protein 25	UPS	E3 ligase	CRL family	F-box	only	IPR036047	(none noted)	Q8TCJ0	26260	FBX25	367	43313
FBXO32	F-box only protein 32	UPS	E3 ligase	CRL family	F-box	only	IPR036047	(none noted)	Q969P5	114907		355	41637
FBXO47	F-box only protein 47	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q5MNV8	494188		452	51968
FBXO15	F-box only protein 15	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q8NCQ5	201456	FBX15	510	57258
FBXO31	F-box only protein 31	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q5XUX0	79791	FBX14 FBX31	539	60664
FBXO46	F-box only protein 46	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q6PJ61	23403	FBX46 FBXO34L	603	64631
FBXO34	F-box only protein 34	UPS	E3 ligase	CRL family	F-box	only	IPR036047, IPR001810	(none noted)	Q9NWN3	55030	FBX34	711	78711
VHL	von Hippel-Lindau disease tumor suppressor	UPS	E3 ligase	CRL family	VHL		IPR022772	(none noted)	P40337	7428		213	24153
VHLL	von Hippel-Lindau-like protein	UPS	E3 ligase	CRL family	VHL		IPR022772	(none noted)	Q6RSH7	391104	VLP	139	15781
SOCS1	Suppressor of cytokine signaling 1	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O15524	8651	SSI1 TIP3	211	23551
SOCS2	Suppressor of cytokine signaling 2	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O14508	8835	CIS2 SSI2 STATI2	198	22172
SOCS3	Suppressor of cytokine signaling 3	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O14543	9021	CIS3 SSI3	225	24770
SOCS4	Suppressor of cytokine signaling 4	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	Q8WXH5	122809	SOCS7	440	50623
SOCS5	Suppressor of cytokine signaling 5	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O75159	9655	CIS6 CISH5 CISH6 KIAA0671	536	61246
SOCS6	Suppressor of cytokine signaling 6	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O14544	9306	CIS4 SOCS4	535	59528
SOCS7	Suppressor of cytokine signaling 7	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	O14512	30837	NAP4 SOCS6	581	62969
CISH	Cytokine-inducible SH2-containing protein	UPS	E3 ligase	CRL family	SOCS box	SH2 domain	IPR001496	IPR000980	Q9NSE2	1154	G18	258	28663
ASB1	Ankyrin repeat and SOCS box protein 1	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9Y576	51665	KIAA1146	335	37014
ASB2	Ankyrin repeat and SOCS box protein 2	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q96Q27	51676		635	70212
ASB3	Ankyrin repeat and SOCS box protein 3	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9Y575	51130		518	57745
ASB4	Ankyrin repeat and SOCS box protein 4	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9Y574	51666		426	48195
ASB5	Ankyrin repeat and SOCS box protein 5	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WWX0	140458		329	36341
ASB6	Ankyrin repeat and SOCS box protein 6	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9NWX5	140459		421	47136
ASB7	Ankyrin repeat and SOCS box protein 7	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9H672	140460		318	36011
ASB8	Ankyrin repeat and SOCS box protein 8	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q9H765	140461		288	31642
ASB9	Ankyrin repeat and SOCS box protein 9	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q96DX5	140462		294	31858
ASB10	Ankyrin repeat and SOCS box protein 10	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WXI3	136371		467	50894
ASB11	Ankyrin repeat and SOCS box protein 11	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WXH4	140456		323	35367
ASB12	Ankyrin repeat and SOCS box protein 12	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WXK4	142689		309	33943
ASB13	Ankyrin repeat and SOCS box protein 13	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WXK3	79754		278	30007
ASB14	Ankyrin repeat and SOCS box protein 14	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	A6NK59	142686		587	65331
ASB15	Ankyrin repeat and SOCS box protein 15	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q8WXK1	142685		588	65799
ASB16	Ankyrin repeat and SOCS box protein 16	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q96NS5	92591		453	49637
ASB17	Ankyrin repeat and SOCS box protein 17	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770	Q8WXJ9	127247		295	34282
ASB18	Ankyrin repeat and SOCS box protein 18	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	IPR001496	IPR036770, IPR002110	Q6ZVZ8	401036		466	50803
ANKRD9	Ankyrin repeat domain-containing protein 9	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	SOCS box @ 276-309 (unpublished)	IPR036770, IPR002110	Q96BM1	122416		317	34295
ANKRD61	Ankyrin repeat domain-containing protein 61	UPS	E3 ligase	CRL family	SOCS box	ankyrin repeats	SOCS box @ 370-412 (unpublished)	IPR036770, IPR002110	A6NGH8	100310846		418	46141
SPSB1	SPRY domain-containing SOCS box protein 1	UPS	E3 ligase	CRL family	SOCS box	SPRY domain	IPR001496	IPR003877	Q96BD6	80176	SSB1	273	30942
SPSB2	SPRY domain-containing SOCS box protein 2	UPS	E3 ligase	CRL family	SOCS box	SPRY domain	IPR001496	IPR003877	Q99619	84727	GRCC9 SSB2	263	28630
SPSB3	SPRY domain-containing SOCS box protein 3	UPS	E3 ligase	CRL family	SOCS box	SPRY domain	IPR001496	IPR003877	Q6PJ21	90864	C16orf31 SSB3	355	39376
SPSB4	SPRY domain-containing SOCS box protein 4	UPS	E3 ligase	CRL family	SOCS box	SPRY domain	IPR001496	IPR003877	Q96A44	92369	SSB4	273	30179
RAB40A	Ras-related protein Rab-40A	UPS	E3 ligase	CRL family	SOCS box	small GTPase	IPR001496	IPR001806	Q8WXH6	142684		277	31076
RAB40B	Ras-related protein Rab-40B	UPS	E3 ligase	CRL family	SOCS box	small GTPase	IPR001496	IPR001806	Q12829	10966	SEC4L	278	30956
RAB40C	Ras-related protein Rab-40C	UPS	E3 ligase	CRL family	SOCS box	small GTPase	IPR001496	IPR001806	Q96S21	57799	RARL RASL8C	281	31304
RAB40AL	Ras-related protein Rab-40A-like	UPS	E3 ligase	CRL family	SOCS box	small GTPase	IPR001496	IPR001806	P0C0E4	282808	RLGP	278	31239
WSB1	WD repeat and SOCS box-containing protein 1	UPS	E3 ligase	CRL family	SOCS box	WD40	IPR001496	IPR015943, IPR036322	Q9Y6I7	26118	SWIP1	421	47432
WSB2	WD repeat and SOCS box-containing protein 2	UPS	E3 ligase	CRL family	SOCS box	WD40	IPR001496	IPR015943, IPR036322	Q9NYS7	55884		404	45286
TULP4	Tubby-related protein 4	UPS	E3 ligase	CRL family	SOCS box	WD40	IPR001496	IPR015943, IPR036322	Q9NRJ4	56995	KIAA1397 TUBL4 TUSP	1543	169000

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
AMN1	Protein AMN1 homolog	UPS	E3 ligase	CRL family	SOCS box	LRR	SOCS box @ 5 - 44 (unpublished)	IPR032675	Q8IY45	196394		258	28408
LRRC41	Leucine-rich repeat-containing protein 41	UPS	E3 ligase	CRL family	SOCS box	LRR	SOCS box @ 43 - 110 (unpublished)	IPR032675	Q15345	10489	MUF1	812	88650
NEURL2	Neuralized-like protein 2	UPS	E3 ligase	CRL family	SOCS box	NHR	IPR001496	IPR037962, IPR006573	Q9BR09	140825	C20orf163	285	31690
PCMTD1	Protein-L-isoaspartate O-methyltransferase domain-containing protein 1	UPS	E3 ligase	CRL family	SOCS box	assorted	SOCS box @ 320 - 357 (unpublished)	(none noted)	Q96MG8	115294		357	40675
PCMTD2	Protein-L-isoaspartate O-methyltransferase domain-containing protein 2	UPS	E3 ligase	CRL family	SOCS box	assorted	SOCS box @ 330 - 361 (unpublished)	(none noted)	Q9NV79	55251	C20orf36	361	41072
WDR53	WD repeat-containing protein 53	UPS	E3 ligase	CRL family	DCAF	WD40 / also APC	PMID: 17041588	IPR015943, IPR036322	Q7Z5U6	348793		358	38989
BRWD1	Bromodomain and WD repeat-containing protein 1	UPS	E3 ligase	CRL family	DCAF	WD40 / with bromodomain	PMID: 16964240	IPR015943, IPR036322, IPR001487	Q9NSI6	54014	C21orf107 WDR9	2320	262936
PHIP	PH-interacting protein	UPS	E3 ligase	CRL family	DCAF	WD40 / with bromodomain	PMID: 16949367, 16964240	IPR015943, IPR036322, IPR001487	Q8WWQ0	55023	DCAF14 WDR11	1821	206689
FBXW5	F-box/WD repeat-containing protein 5	UPS	E3 ligase	CRL family	DCAF	WD40 / with F box	PMID: 17079684	IPR015943, IPR036322, IPR001810	Q969U6	54461	FBW5	566	63922
FBXW8	F-box/WD repeat-containing protein 8	UPS	E3 ligase	CRL family	DCAF	WD40 / with F box	PMID: 17079684	IPR015943, IPR001810	Q8N3Y1	26259	FBW6 FBW8 FBX29 FBXO29 FBXW6	598	67394
DCAF6	DDB1- and CUL4-associated factor 6	UPS	E3 ligase	CRL family	DCAF	WD40 / with IQ motif	PMID: 16949367, 16964240	IPR015943, IPR036322, IPR000048	Q58WW2	55827	IQWD1	860	96292
DCAF1	DDB1- and CUL4-associated factor 1	UPS	E3 ligase	CRL family	DCAF	WD40 / with LisH	PMID: 16949367, 16964240	IPR011989, IPR015943, IPR036322, IPR006594	Q9Y4B6	9730	KIAA0800 RIP VPRBP	1507	169007
PAFAH1B1	Platelet-activating factor acetylhydrolase IB subunit beta	UPS	E3 ligase	CRL family	DCAF	WD40 / with LisH	PMID: 17041588	IPR015943, IPR036322, IPR006594	P43034	5048	LIS1 MDCR MDS PAFAHA	410	46638
SMU1	WD40 repeat-containing protein SMU1	UPS	E3 ligase	CRL family	DCAF	WD40 / with LisH	PMID: 17041588	IPR015943, IPR036322, IPR006594	Q2TAY7	55234		513	57544
WDR26	WD repeat-containing protein 26	UPS	E3 ligase	CRL family	DCAF	WD40 / with LisH	PMID: 17041588	IPR015943, IPR036322, IPR006594	Q9H7D7	80232	CDW2 MIP2	661	72124
WDR59	GATOR complex protein WDR59	UPS	E3 ligase	CRL family	DCAF	WD40 / with RWD	PMID: 17041588	IPR015943, IPR036322, IPR006575	Q6PJI9	79726	KIAA1923	974	109793
WSB1	WD repeat and SOCS box-containing protein 1	UPS	E3 ligase	CRL family	DCAF	WD40 / with SOCS box	PMID: 17079684	IPR015943, IPR036322, IPR001496	Q9Y6I7	26118	SWIP1	421	47432
WSB2	WD repeat and SOCS box-containing protein 2	UPS	E3 ligase	CRL family	DCAF	WD40 / with SOCS box	PMID: 17079684	IPR015943, IPR036322, IPR001496	Q9NYS7	55884		404	45286
WDTC1	WD and tetratricopeptide repeats protein 1	UPS	E3 ligase	CRL family	DCAF	WD40 / with TPR	PMID: 16949367, 16964240	IIPR011990, IPR015943, IPR036322, IPR011990, IPR019734	Q8N5D0	23038	KIAA1037	677	75920
AMBRA1	Activating molecule in BECN1-regulated autophagy protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q9C0C7	55626	DCAF3 KIAA1736	1298	142507
CIAO1	Probable cytosolic iron-sulfur protein assembly protein CIAO1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	O76071	9391	CIA1 WDR39	339	37840
COP1	E3 ubiquitin-protein ligase COP1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 17041588	IPR001841, IPR015943, IPR036322, IPR001841	Q8NHY2	64326	RFWD2 RNF200	731	80474
DCAF4	DDB1- and CUL4-associated factor 4	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q8WV16	26094	WDR21 WDR21A	495	55694
DCAF4L1	DDB1- and CUL4-associated factor 4-like protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF4	IPR015943, IPR036322	Q3SXM0	285429	WDR21B	396	44264
DCAF4L2	DDB1- and CUL4-associated factor 4-like protein 2	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF4	IPR015943, IPR036322	Q8NA75	138009	WDR21C	395	43747
DCAF5	DDB1- and CUL4-associated factor 5	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q96JK2	8816	BCRG2 KIAA1824 WDR22	942	103963
DCAF7	DDB1- and CUL4-associated factor 7	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367	IPR015943, IPR036322	P61962	10238	HAN11 WDR68	342	38926
DCAF8	DDB1- and CUL4-associated factor 8	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q5TAQ9	50717	H326 WDR42A	597	66852
DCAF8L1	DDB1- and CUL4-associated factor 8-like protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF8	IPR015943, IPR036322	A6NGE4	139425	WDR42B	600	67373
DCAF8L2	DDB1- and CUL4-associated factor 8-like protein 2	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF8	IPR015943, IPR036322	P0C7V8	347442	WDR42C	631	71191
DCAF10	DDB1- and CUL4-associated factor 10	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q5QP82	79269	WDR32	559	60582
DCAF11	DDB1- and CUL4-associated factor 11	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240, 17079684	IPR015943, IPR036322	Q8TEB1	80344	WDR23	546	61670
DCAF12	DDB1- and CUL4-associated factor 12	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240	IPR015943, IPR036322	Q5T6F0	25853	KIAA1892 TCC52 WDR40A	453	50517
DCAF12L1	DDB1- and CUL4-associated factor 12-like protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF12	IPR015943, IPR036322	Q5VU92	139170	WDR40B	463	51201
DCAF12L2	DDB1- and CUL4-associated factor 12-like protein 2	UPS	E3 ligase	CRL family	DCAF	WD40	by homology with DCAF12	IPR015943, IPR036322	Q5VW00	340578	WDR40C	463	50803
DCAF13	DDB1- and CUL4-associated factor 13	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367	IPR015943, IPR036322	Q9NV06	25879	WDSOF1	445	51402
DDB2	DNA damage-binding protein 2	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240, 17041588, 17079684	IPR015943, IPR036322	Q92466	1643		427	47864
DTL	Denticleless protein homolog	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240, 17041588, 17079684	IPR015943, IPR036322	Q9NZJ0	51514	CDT2 CDW1 DCAF2 L2DTL RAMP	730	79468
EED	Polycomb protein EED	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	O75530	8726		441	50198
ERCC8	DNA excision repair protein ERCC-8	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 16949367, 16964240, 17041588, 17079684	IPR015943, IPR036322	Q13216	1161	CKN1 CSA	396	44055
GNB2	Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17079684	IPR015943, IPR036322	P62879	2783		340	37331
GRWD1	Glutamate-rich WD repeat-containing protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588, 17079684	IPR015943, IPR036322	Q9BQ67	83743	GRWD KIAA1942 WDR28	446	49419
KATNB1	Katanin p80 WD40 repeat-containing subunit B1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17079684	IPR015943, IPR036322	Q9BVA0	10300		655	72334
NLE1	Notchless protein homolog 1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q9NVX2	54475		485	53320
POC1B	POC1 centriolar protein homolog B	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q8TC44	282809	WDR51B	478	53668
PWP1	Periodic tryptophan protein 1 homolog	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17079684	IPR015943, IPR036322	Q13610	11137		501	55828
RBBP4	Histone-binding protein RBBP4	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17079684	IPR015943, IPR036322	Q09028	5928	RBAP48	425	47656
RBBP5	Retinoblastoma-binding protein 5	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943	Q15291	5929	RBQ3	538	59153
RBBP7	Histone-binding protein RBBP7	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17079684	IPR015943, IPR036322	Q16576	5931	RBAP46	425	47820
SNRNP40	U5 small nuclear ribonucleoprotein 40 kDa protein	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q96DI7	9410	PRP8BP SFP38 WDR57	357	39311
TLE1	Transducin-like enhancer protein 1	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q04724	7088		770	83201
TLE2	Transducin-like enhancer protein 2	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q04725	7089		743	79841
TLE3	Transducin-like enhancer protein 3	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q04726	7090	KIAA1547	772	83417
WDR12	Ribosome biogenesis protein WDR12	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q9GZL7	55759		423	47708
WDR5	WD repeat-containing protein 5	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	P61964	11091	BIG3	334	36588
WDR5B	WD repeat-containing protein 5B	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q86VZ2	54554		330	36338
WDR61	WD repeat-containing protein 61	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q9GZS3	80349		305	33581

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
WDR76	WD repeat-containing protein 76	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q9H967	79968		626	69769
WDR82	WD repeat-containing protein 82	UPS	E3 ligase	CRL family	DCAF	WD40	PMID: 17041588	IPR015943, IPR036322	Q6UXN9	80335	TMEM113 WDR82A	313	35079
CRBN	Protein cereblon	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16964240	IPR004910, IPR003111	Q96SW2	51185		442	50546
DCAF15	DDB1- and CUL4-associated factor 15	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16949367, 16964240	(none noted)	Q66K64	90379	C19orf72	600	66463
DCAF16	DDB1- and CUL4-associated factor 16	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16949367, 16964240	(none noted)	Q9NXF7	54876	C4orf30	216	24193
DCAF17	DDB1- and CUL4-associated factor 17	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16949367	(none noted)	Q5H9S7	80067	C2orf37	520	58778
DDA1	DET1- and DDB1-associated protein 1	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16949367, 16964240	(none noted)	Q9BW61	79016	C19orf58 PCIA1	102	11835
DET1	DET1 homolog	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16949367	(none noted)	Q7L5Y6	55070		550	63848
TOR1AIP2	Torsin-1A-interacting protein 2, isoform IFRG15	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16964240	(none noted)	Q8NFQ8	163590	IFRG15	470	51263
TRPC4AP	Short transient receptor potential channel 4-associated protein	UPS	E3 ligase	CRL family	DCAF	non-WD40	PMID: 16964240	IPR016024	Q8TEL6	26133	C20orf188 TRRP4AP	797	90852
BTBD1	BTB/POZ domain-containing protein 1	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q9H0C5	53339	C15orf1 NS5ATP8	482	52771
BTBD19	BTB/POZ domain-containing protein 19	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	C9JJ37	149478		291	32365
BTBD2	BTB/POZ domain-containing protein 2	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q9BX70	55643		525	55931
BTBD3	BTB/POZ domain-containing protein 3	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q9Y2F9	22903	KIAA0952	522	58420
BTBD6	BTB/POZ domain-containing protein 6	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q96KE9	90135	BDPL	538	58776
BTBD7	BTB/POZ domain-containing protein 7	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q9P203	55727	KIAA1525	1132	126368
BTBD9	BTB/POZ domain-containing protein 9	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q96Q07	114781	KIAA1880	612	69188
GMCL1	Germ cell-less protein-like 1	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q96IK5	64395	BTBD13 GCL SPATA29	515	58685
LGALS3BP	Galectin-3-binding protein	UPS	E3 ligase	CRL family	BTB	with BACK	IPR000210, IPR011333	IPR011705	Q08380	3959	M2BP	585	65331
CCIN	Calicin	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q13939	881		588	66582
ENC1	Ectoderm-neural cortex protein 1	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	O14682	8507	KLHL37 NRPB PIG10	589	66130
GAN	Gigaxonin	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9H2C0	8139	GAN1 KLHL16	597	67638
IPP	Actin-binding protein IPP	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9Y573	3652	KLHL27	584	65261
IVNS1ABP	Influenza virus NS1A-binding protein	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9Y6Y0	10625	ARA3 FLARA3 KIAA0850 KLHL39 NS1 NS1BP	642	71729
KBTBD12	Kelch repeat and BTB domain-containing protein 12	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q3ZCT8	166348	KLHDC6	623	71096
KBTBD2	Kelch repeat and BTB domain-containing protein 2	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8IY47	25948	BKLHD1 KIAA1489	623	71331
KBTBD3	Kelch repeat and BTB domain-containing protein 3	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8NAB2	143879	BKLHD3	612	69839
KBTBD4	Kelch repeat and BTB domain-containing protein 4	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9NVX7	55709	BKLHD4	518	58144
KBTBD6	Kelch repeat and BTB domain-containing protein 6	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q86V97	89890		674	76138
KBTBD7	Kelch repeat and BTB domain-containing protein 7	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8WVZ9	84078		684	77163
KBTBD8	Kelch repeat and BTB domain-containing protein 8	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8NFY9	84541	KIAA1842 TAKRP	601	68823
KEAP1	Kelch-like ECH-associated protein 1	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q14145	9817	INRF2 KIAA0132 KLHL19	624	69666
KLHL1	Kelch-like protein 1	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9NR64	57626	KIAA1490	748	82680
KLHL10	Kelch-like protein 10	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q6JEL2	317719		608	68942
KLHL11	Kelch-like protein 11	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9NVR0	55175		708	80148
KLHL12	Kelch-like protein 12	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q53G59	59349	C3IP1	568	63277
KLHL13	Kelch-like protein 13	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9P2N7	90293	BKLHD2 KIAA1309	655	73868
KLHL14	Kelch-like protein 14	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9P2G3	57565	KIAA1384	628	70714
KLHL15	Kelch-like protein 15	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q96M94	80311	KIAA1677	604	69775
KLHL17	Kelch-like protein 17	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q6TDP4	339451		642	69874
KLHL18	Kelch-like protein 18	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	O94889	23276	KIAA0795	574	63638
KLHL2	Kelch-like protein 2	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	O95198	11275		593	65975
KLHL20	Kelch-like protein 20	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9Y2M5	27252	KLEIP KLHLX	609	67955
KLHL21	Kelch-like protein 21	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9UJP4	9903	KIAA0469	597	66617
KLHL22	Kelch-like protein 22	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q53GT1	84861		634	71667
KLHL23	Kelch-like protein 23	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8NBE8	151230		558	63923
KLHL24	Kelch-like protein 24	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q6TFL4	54800	DRE1	600	68361
KLHL25	Kelch-like protein 25	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9H0H3	64410	ENC2	589	65923
KLHL26	Kelch-like protein 26	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q53HC5	55295		615	68139
KLHL28	Kelch-like protein 28	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9NXS3	54813	BTBD5	571	64192
KLHL29	Kelch-like protein 29	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q96CT2	114818	KBTBD9 KIAA1921	875	94228
KLHL3	Kelch-like protein 3	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9UH77	26249	KIAA1129	587	64970
KLHL30	Kelch-like protein 30	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q0D2K2	377007		578	63976
KLHL31	Kelch-like protein 31	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9H511	401265	BKLHD6 KBTBD1 KLHL	634	70246
KLHL32	Kelch-like protein 32	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q96NJ5	114792	BKLHD5 KIAA1900	620	70362
KLHL33	Kelch-like protein 33	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR011333	IPR011705, IPR015915	A6NCF5	123103		533	57810
KLHL34	Kelch-like protein 34	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8N239	257240		644	70612
KLHL35	Kelch-like protein 35	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q6PF15	283212		583	62892
KLHL36	Kelch-like protein 36	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8N4N3	79786	C16orf44	616	69896
KLHL38	Kelch-like protein 38	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q2WGJ6	340359	C8orfK36	581	65541
KLHL4	Kelch-like protein 4	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9C0H6	56062	KIAA1687	718	80245
KLHL40	Kelch-like protein 40	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q2TBA0	131377	KBTBD5 SRYP	621	69257
KLHL41	Kelch-like protein 41	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	O60662	10324	KBTBD10 KRP1	606	68037
KLHL42	Kelch-like protein 42	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9P2K6	57542	KIAA1340 KLHDC5	505	56868
KLHL5	Kelch-like protein 5	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q96PQ7	51088		755	84457

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
KLHL6	Kelch-like protein 6	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8WZ60	89857		621	70359
KLHL7	Kelch-like protein 7	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q8IXQ5	55975		586	65992
KLHL8	Kelch-like protein 8	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9P2G9	57563	KIAA1378	620	68802
KLHL9	Kelch-like protein 9	UPS	E3 ligase	CRL family	BTB	with BACK & KELCH	IPR000210, IPR011333	IPR011705, IPR015915	Q9P2J3	55958	KIAA1354	617	69429
KBTBD11	Kelch repeat and BTB domain-containing protein 11	UPS	E3 ligase	CRL family	BTB	with KELCH	IPR000210, IPR011333	IPR015915	O94819	9920	CMLAP KIAA0711 KLHDC7C	623	65720
KBTBD13	Kelch repeat and BTB domain-containing protein 13	UPS	E3 ligase	CRL family	BTB	with KELCH	IPR000210, IPR011333	IPR015915	C9JR72	390594		458	49485
LZTR1	Leucine-zipper-like transcriptional regulator 1	UPS	E3 ligase	CRL family	BTB	with KELCH	IPR000210, IPR011333	IPR015915	Q8N653	8216	TCFL2	840	94719
KCTD3	BTB/POZ domain-containing protein KCTD3	UPS	E3 ligase	CRL family	BTB	KCTD type (with WD40)	IPR000210, IPR011333, IPR003131	IPR015943, IPR036322	Q9Y597	51133		815	88984
SHKBP1	SH3KBP1-binding protein 1	UPS	E3 ligase	CRL family	BTB	KCTD type (with WD40)	IPR000210, IPR011333, IPR003131	IPR015943, IPR036322	Q8TBC3	92799	SB1	707	76344
KCTD2	BTB/POZ domain-containing protein KCTD2	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q14681	23510	KIAA0176	263	28527
KCTD5	BTB/POZ domain-containing protein KCTD5	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q9NXV2	54442		234	26093
KCTD6	BTB/POZ domain-containing protein KCTD6	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q8NC69	200845		237	27610
KCTD9	BTB/POZ domain-containing protein KCTD9	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q7L273	54793		389	42567
KCTD10	BTB/POZ domain-containing adapter for CUL3-mediated RhoA degradation protein 3	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q9H3F6	83892	ULR061	313	35432
KCTD11	BTB/POZ domain-containing protein KCTD11	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q693B1	147040	C17orf36 REN	232	25887
KCTD13	BTB/POZ domain-containing adapter for CUL3-mediated RhoA degradation protein 1	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q8WZ19	253980	BACURD1 PDIP1 POLDIP1	329	36357
KCTD17	BTB/POZ domain-containing protein KCTD17	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q8N5Z5	79734		321	35670
KCTD20	BTB/POZ domain-containing protein KCTD20	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR039885	(none noted)	Q7Z5Y7	222658	C6orf69	419	47480
KCTD21	BTB/POZ domain-containing protein KCTD21	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q4G0X4	283219		260	29643
TNFAIP1	BTB/POZ domain-containing adapter for CUL3-mediated RhoA degradation protein 2	UPS	E3 ligase	CRL family	BTB	KCTD type	IPR000210, IPR011333, IPR003131	(none noted)	Q13829	7126	BACURD2 EDP1	316	36204
SPOP	Speckle-type POZ protein	UPS	E3 ligase	CRL family	BTB	BTB only / with MATH/TRAF	IPR000210, IPR011333	IPR002083	O43791	8405		374	42132
SPOPL	Speckle-type POZ protein-like	UPS	E3 ligase	CRL family	BTB	BTB only / with MATH/TRAF	IPR000210, IPR011333	IPR002083	Q6IQ16	339745		392	44647
ABTB1	Ankyrin repeat and BTB/POZ domain-containing protein 1	UPS	E3 ligase	CRL family	BTB	BTB only / with ankyrin repeats	IPR000210, IPR011333	IPR002110	Q969K4	80325	BPOZ	478	53979
ABTB2	Ankyrin repeat and BTB/POZ domain-containing protein 2	UPS	E3 ligase	CRL family	BTB	BTB only / with ankyrin repeats	IPR000210, IPR011333	IPR002110	Q8N961	25841		1025	113656
ANKFY1	Rabankyrin-5	UPS	E3 ligase	CRL family	BTB	BTB only / with ankyrin repeats	IPR000210, IPR011333	IPR002110	Q9P2R3	51479	ANKHZN KIAA1255	1169	128399
BTBD11	Ankyrin repeat and BTB/POZ domain-containing protein BTBD11	UPS	E3 ligase	CRL family	BTB	BTB only / with ankyrin repeats	IPR000210, IPR011333	IPR002110	A6QL63	121551		1104	120884
IBTK	Inhibitor of Bruton tyrosine kinase	UPS	E3 ligase	CRL family	BTB	BTB only / with ankyrin repeats & RCC1	IPR000210, IPR011333	IPR002110, IPR000408	Q9P2D0	25998	BTKI KIAA1417	1353	150528
RCBTB1	RCC1 and BTB domain-containing protein 1	UPS	E3 ligase	CRL family	BTB	BTB only / with RCC1	IPR000210, IPR011333	IPR000408	Q8NDN9	55213	CLLD7 E4.5	531	58252
RCBTB2	RCC1 and BTB domain-containing protein 2	UPS	E3 ligase	CRL family	BTB	BTB only / with RCC1	IPR000210, IPR011333	IPR000408	O95199	1102	CHC1L RLG	551	60315
ARMC5	Armadillo repeat-containing protein 5	UPS	E3 ligase	CRL family	BTB	BTB only / with Armadillo-like	IPR000210, IPR011333	IPR011989	Q96C12	79798		935	97682
RHOBTB1	Rho-related BTB domain-containing protein 1	UPS	E3 ligase	CRL family	BTB	BTB only / with small GTPase	IPR000210, IPR011333	IPR001806	O94844	9886	KIAA0740	696	79417
RHOBTB3	Rho-related BTB domain-containing protein 3	UPS	E3 ligase	CRL family	BTB	BTB only / with small GTPase	IPR000210, IPR011333	IPR001806	O94955	22836	KIAA0878	611	69413
RHOBTB2	Rho-related BTB domain-containing protein 2	UPS	E3 ligase	CRL family	BTB	BTB only / with small GTPase	IPR000210, IPR011333	IPR001806	Q9BYZ6	23221	DBC2 KIAA0717	727	82626
BTBD10	BTB/POZ domain-containing protein 10	UPS	E3 ligase	CRL family	BTB	BTB only (Bioplex only)	IPR000210, IPR011333	(none noted)	Q9BSF8	84280	GMRP1	475	53779
BTBD8	BTB/POZ domain-containing protein 8	UPS	E3 ligase	CRL family	BTB	BTB only (KH only)	IPR000210, IPR011333	(none noted)	Q5XKL5	284697		1792	199030
GMCL2	Germ cell-less protein-like 2	UPS	E3 ligase	CRL family	BTB	BTB only (KH & Bioplex)	IPR000210, IPR011333	(none noted)	Q8NEA9	64396	GCL GMCL1L GMCL1P1	526	60299
KLHDC1	Kelch domain-containing protein 1	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with KELCH	(none noted)	IPR015915	Q8N7A1	122773		406	46720
KLHDC2	Kelch domain-containing protein 2	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with KELCH	(none noted)	IPR015915	Q9Y2U9	23588	HCA33	406	46099
KLHDC3	Kelch domain-containing protein 3	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with KELCH	(none noted)	IPR015915	Q9BQ90	116138	PEAS	382	43088
KLHDC10	Kelch domain-containing protein 10	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with KELCH	(none noted)	IPR015915	Q6PID8	23008	KIAA0265	442	49098
FEM1A	Protein fem-1 homolog A	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR011990	Q9BSK4	55527	EPRAP	669	73639
FEM1C	Protein fem-1 homolog C	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR011990	Q96JP0	56929	KIAA1785	617	68673
APPBP2	Amyloid protein-binding protein 2	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR011990, IPR019734	Q92624	10513	KIAA0228 PAT1	585	66853
LRR1	Leucine-rich repeat protein 1	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR032675	Q96L50	122769	PPIL5	414	46723
PRAME	Melanoma antigen preferentially expressed in tumors	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR032675	P78395	23532	MAPE OIP4	509	57890
PRAMEF6	PRAME family member 6	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR032675	Q5VXH4	440561		476	54852
PRAMEF9	PRAME family member 9	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR	(none noted)	IPR032675	P0DUQ2	653619		478	55420
ZER1	Protein zer-1 homolog (Hzyg)	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR, Armadillo-like	(none noted)	IPR011989, IPR032675	Q7Z7L7	10444	C9orf60 ZYG ZYG11BL	766	88169
ZYG11A	Protein zyg-11 homolog A	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR, Armadillo-like	(none noted)	IPR011989, IPR032675	Q6WRX3	440590	ZYG11	759	85808
ZYG11B	Protein zyg-11 homolog B	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / with TPR, Armadillo-like	(none noted)	IPR011989, IPR032675	Q9C0D3	79699	KIAA1730	744	83921
ZSWIM8	Zinc finger SWIM domain-containing protein 8	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical / SWIM-type ZnF	(none noted)	IPR007527	A7E2V4	23053	KIAA0913	1837	197297

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
ANKRD9	Ankyrin repeat domain-containing protein 9	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical	(none noted)	(none noted)	Q96BM1	122416		317	34295
FEM1B	Protein fem-1 homolog B	UPS	E3 ligase	CRL family	substrate adaptors	non-canonical	(none noted)	(none noted)	Q9UK73	10116	F1AA KIAA0396	627	70264
		UPS	**E3 ligase**	**RBR**									
ANKIB1	Ankyrin repeat and IBR domain-containing protein 1	UPS	E3 ligase	RBR	Ariadne, ankyrin repeats, UIM		IPR044066, IPR001841	IPR045840, IPR036770, IPR003903	Q9P2G1	54467	KIAA1386	1089	122002
ARIH1	E3 ubiquitin-protein ligase ARIH1	UPS	E3 ligase	RBR	Ariadne		IPR044066, IPR001841	IPR045840	Q9Y4X5	25820	ARI MOP6 UBCH7BP	557	64118
ARIH2	E3 ubiquitin-protein ligase ARIH2	UPS	E3 ligase	RBR	Ariadne		IPR044066, IPR001841	IPR045840	O95376	10425	ARI2 TRIAD1	493	57819
CUL9	Cullin-9	UPS	E3 ligase	RBR	Cullin, Armadillo-like		IPR044066, IPR001841	IPR016158, IPR011989, IPR036317	Q8IWT3	23113	H7AP1 KIAA0708 PARC	2517	281229
RNF14	E3 ubiquitin-protein ligase RNF14	UPS	E3 ligase	RBR	RWD		IPR044066, IPR001841	IPR006575	Q9UBS8	9604	ARA54	474	53837
PRKN	E3 ubiquitin-protein ligase parkin	UPS	E3 ligase	RBR	UBL		IPR044066	IPR000626	O60260	5071	PARK2	465	51641
RBCK1	RanBP-type and C3HC4-type zinc finger-containing protein 1	UPS	E3 ligase	RBR	UBL, RanBP2-type ZnF		IPR044066, IPR001841	IPR000626, IPR001876	Q9BYM8	10616	C20orf18 RNF54 UBCE7IP3 XAP3 XAP4	510	57572
RNF31	E3 ubiquitin-protein ligase RNF31	UPS	E3 ligase	RBR	RanBP2-type ZnF, PUB, UBA		IPR044066	IPR018997, IPR032065, IPR001876, IPR015940	Q96EP0	55072	ZIBRA	1072	119652
RNF19A	E3 ubiquitin-protein ligase RNF19A	UPS	E3 ligase	RBR	assorted		IPR044066, IPR001841	(none noted)	Q9NV58	25897	RNF19	838	90696
RNF19B	E3 ubiquitin-protein ligase RNF19B	UPS	E3 ligase	RBR	assorted		IPR044066, IPR001841	(none noted)	Q6ZMZ0	127544	IBRDC3 NKLAM	732	77925
RNF144A	E3 ubiquitin-protein ligase RNF144A	UPS	E3 ligase	RBR	assorted		IPR044066, IPR001841	(none noted)	P50876	9781	KIAA0161 RNF144 UBCE7IP4	292	32890
RNF144B	E3 ubiquitin-protein ligase RNF144B	UPS	E3 ligase	RBR	assorted		IPR044066, IPR001841	(none noted)	Q7Z419	255488	IBRDC2 P53RFP	303	33697
RNF216	E3 ubiquitin-protein ligase RNF216	UPS	E3 ligase	RBR	assorted		IPR044066	(none noted)	Q9NWF9	54476	TRIAD3 UBCE7IP1 ZIN	866	99406
RNF217	E3 ubiquitin-protein ligase RNF217	UPS	E3 ligase	RBR	assorted		IPR044066	(none noted)	Q8TC41	154214	C6orf172 IBRDC1	542	59372
		UPS	**E3 ligase**	**RING**									
MID1	E3 ubiquitin-protein ligase Midline-1	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841, IPR027370	IPR001870, IPR003961, IPR017903	O15344	4281	FXY RNF59 TRIM18 XPRF	667	75251
MID2	Probable E3 ubiquitin-protein ligase MID2	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841, IPR027370	IPR001870, IPR003961, IPR017903	Q9UJV3	11043	FXY2 RNF60 TRIM1	735	83210
TRIM36	E3 ubiquitin-protein ligase TRIM36	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841, IPR027370	IPR001870, IPR003961, IPR017903	Q9NQ86	55521	RBCC728 RNF98	728	83013
TRIM9	E3 ubiquitin-protein ligase TRIM9	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841	IPR001870, IPR003961, IPR017903	Q9C026	114088	KIAA0282 RNF91	710	79177
TRIM67	Tripartite motif-containing protein 67	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841	IPR001870, IPR003961, IPR017903	Q6ZTA4	440730	TNL	783	83823
TRIM46	Tripartite motif-containing protein 46	UPS	E3 ligase	RING	TRIM	COS, FN, SPRY	IPR001841	IPR001870, IPR003961, IPR017903	Q7Z4K8	80128	TRIFIC	759	83424
TRIM54	Tripartite motif-containing protein 54	UPS	E3 ligase	RING	TRIM	COS	IPR001841, IPR027370	IPR017903	Q9BYV2	57159	MURF MURF3 RNF30	358	40301
TRIM55	Tripartite motif-containing protein 55	UPS	E3 ligase	RING	TRIM	COS	IPR001841, IPR027370	IPR017903	Q9BYV6	84675	MURF2 RNF29	548	60466
TRIM63	E3 ubiquitin-protein ligase TRIM63	UPS	E3 ligase	RING	TRIM	COS	IPR001841, IPR027370	IPR017903	Q969Q1	84676	IRF MURF1 RNF28 SMRZ	353	40248
TRIM42	Tripartite motif-containing protein 42	UPS	E3 ligase	RING	TRIM	COS, FN	IPR001841	IPR017903, IPR003961	Q8IWZ5	287015		723	82745
TRIM21	E3 ubiquitin-protein ligase TRIM21	UPS	E3 ligase	RING	TRIM	SPRY, UBOX	IPR001841	IPR001870, IPR003613	P19474	6737	RNF81 RO52 SSA1	475	54170
TRIM6	Tripartite motif-containing protein 6	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q9C030	117854	RNF89	488	56400
TRIM10	Tripartite motif-containing protein 10	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q9UDY6	10107	RFB30 RNF9	481	55037
TRIM15	Tripartite motif-containing protein 15	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q9C019	89870	RNF93 ZNF178 ZNFB7	465	52113
TRIM17	E3 ubiquitin-protein ligase TRIM17	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q9Y577	51127	RBCC RNF16 TERF	477	54418
TRIM50	E3 ubiquitin-protein ligase TRIM50	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q86XT4	135892	TRIM50A	487	54728
TRIM5	Tripartite motif-containing protein 5	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q9C035	85363	RNF88	493	56338
TRIM22	E3 ubiquitin-protein ligase TRIM22	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q8IYM9	10346	RNF94 STAF50	498	56947
TRIM47	E3 ubiquitin-protein ligase TRIM47	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841, IPR027370	IPR001870	Q96LD4	91107	GOA RNF100	638	69532
TRIM7	E3 ubiquitin-protein ligase TRIM7	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9C029	81786	GNIP RNF90	511	56631
TRIM27	Zinc finger protein RFP	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	P14373	5987	RFP RNF76	513	58490
TRIM11	E3 ubiquitin-protein ligase TRIM11	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q96F44	81559	RNF92	468	52774
TRIM26	Tripartite motif-containing protein 26	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q12899	7726	RNF95 ZNF173	539	62166
TRIM35	E3 ubiquitin-protein ligase TRIM35	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9UPQ4	23087	HLS5 KIAA1098	493	56540
TRIM38	E3 ubiquitin-protein ligase TRIM38	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	O00635	10475	RNF15 RORET	465	53416
TRIM39	E3 ubiquitin-protein ligase TRIM39	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9HCM9	56658	RNF23 TFP	518	59690
TRIM41	E3 ubiquitin-protein ligase TRIM41	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q8WV44	90933	RINCK	630	71670
TRIM58	E3 ubiquitin-protein ligase TRIM58	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q8NG06	25893		486	54766
TRIM60	Tripartite motif-containing protein 60	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q495X7	166655	RNF129 RNF33	471	55114
TRIM62	E3 ubiquitin-protein ligase TRIM62	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9BVG3	55223		475	54268
TRIM72	Tripartite motif-containing protein 72	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q6ZMU5	493829	MG53	477	52731
TRIM75P	Tripartite motif-containing protein 75	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	A6NK02	391714	TRIM75	468	53678
TRIM43	Tripartite motif-containing protein 43	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q96BQ3	129868		446	52265
TRIM4	E3 ubiquitin-protein ligase TRIM4	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9C037	89122	RNF87	500	57461
TRIM34	Tripartite motif-containing protein 34	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q9BYJ4	53840	IFP1 RNF21	488	56864
TRIM64	Tripartite motif-containing protein 64	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	A6NGJ6	120146	C11orf28	449	51566
TRIM65	Tripartite motif-containing protein 65	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q6PJ69	201292		517	57353
TRIM69	E3 ubiquitin-protein ligase TRIM69	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q86WT6	140691	RNF36	500	57419
TRIM25	E3 ubiquitin/ISG15 ligase TRIM25	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q14258	7706	EFP RNF147 ZNF147	630	70973
TRIML1	Probable E3 ubiquitin-protein ligase TRIML1	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	Q8N9V2	339976	RNF209	468	53002
TRIM77	Tripartite motif-containing protein 77	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	I1YAP6	390231	TRIM77P	450	52450
TRIM43B	Tripartite motif-containing protein 43B	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	A6NCK2	653192		446	52310

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
TRIM64B	Putative tripartite motif-containing protein 64B	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	A6NI03	642446		449	51557
TRIM64C	Tripartite motif-containing protein 64C	UPS	E3 ligase	RING	TRIM	SPRY	IPR001841	IPR001870	A6NLI5	646754		450	51540
TRIM68	E3 ubiquitin-protein ligase TRIM68	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	Q6AZZ1	55128	GC109 RNF137 SS56	485	56259
TRIM51	Tripartite motif-containing protein 51	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	Q9BSJ1	84767	SPRYD5	452	52285
TRIM49	Tripartite motif-containing protein 49	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	P0CI25	57093	RNF18	452	52888
TRIM49B	Putative tripartite motif-containing protein 49B	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	A6NDI0	283116	RNF18B	452	52747
TRIM49C	Tripartite motif-containing protein 49C	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	P0CI26	642612	TRIM49L2	452	52933
TRIM49D1	Tripartite motif-containing protein 49D	UPS	E3 ligase	RING	TRIM	SPRY - folded central helix	IPR001841	IPR001870	C9J1S8	399939	TRIM49L TRIM49L1	452	52496
TRIM24	Transcription intermediary factor 1-alpha	UPS	E3 ligase	RING	TRIM	PHD-type ZnF, Bromodomain	IPR001841	IPR001965, IPR001487	O15164	8805	RNF82 TIF1 TIF1A	1050	116831
TRIM28	Transcription intermediary factor 1-beta	UPS	E3 ligase	RING	TRIM	PHD-type ZnF, Bromodomain	IPR001841	IPR001965, IPR001487	Q13263	10155	KAP1 RNF96 TIF1B	835	88550
TRIM33	E3 ubiquitin-protein ligase TRIM33	UPS	E3 ligase	RING	TRIM	PHD-type ZnF, Bromodomain	IPR001841, IPR027370	IPR001965, IPR001487	Q9UPN9	51592	KIAA1113 RFG7 TIF1G	1127	122533
TRIM45	Tripartite motif-containing protein 45	UPS	E3 ligase	RING	TRIM	FIL	IPR001841, IPR027370	IPR017868	Q9H8W5	80263	RNF99	580	64359
TRIM2	Tripartite motif-containing protein 2	UPS	E3 ligase	RING	TRIM	FIL, TolB-like	IPR001841, IPR027370	IPR017868, IPR011042	Q9C040	23321	KIAA0517 RNF86	744	81530
TRIM3	Tripartite motif-containing protein 3	UPS	E3 ligase	RING	TRIM	FIL, TolB-like	IPR001841, IPR027370	IPR017868, IPR011042	O75382	10612	BERP RNF22 RNF97	744	80830
TRIM71	E3 ubiquitin-protein ligase TRIM71	UPS	E3 ligase	RING	TRIM	FIL, TolB-like	IPR001841	IPR017868, IPR011042	Q2Q1W2	131405	LIN41	868	93385
TRIM32	E3 ubiquitin-protein ligase TRIM32	UPS	E3 ligase	RING	TRIM	TolB-like	IPR001841, IPR027370	IPR011042	Q13049	22954	HT2A	653	71989
TRIM56	E3 ubiquitin-protein ligase TRIM56	UPS	E3 ligase	RING	TRIM	TolB-like	IPR001841, IPR027370	IPR011042	Q9BRZ2	81844	RNF109	755	81488
TRIM37	E3 ubiquitin-protein ligase TRIM37	UPS	E3 ligase	RING	TRIM	MATH/TRAF	IPR001841	IPR002083	O94972	4591	KIAA0898 MUL POB1	964	107906
TRIM23	E3 ubiquitin-protein ligase TRIM23	UPS	E3 ligase	RING	TRIM	ARF, P-loop NTP hydrolase	IPR001841, IPR027370	IPR027417	P36406	373	ARD1 ARFD1 RNF46	574	64067
TRIM13	E3 ubiquitin-protein ligase TRIM13	UPS	E3 ligase	RING	TRIM	TM	IPR001841, IPR027370	(none noted)	O60858	10206	LEU5 RFP2 RNF77	407	46988
TRIM59	Tripartite motif-containing protein 59	UPS	E3 ligase	RING	TRIM	TM	IPR001841, IPR027370	(none noted)	Q8IWR1	286827	RNF104 TRIM57 TSBF1	403	47114
PML	Protein PML	UPS	E3 ligase	RING	TRIM	assorted CTD	IPR001841	(none noted)	P29590	5371	MYL PP8675 RNF71 TRIM19	882	97551
RNF207	RING finger protein 207	UPS	E3 ligase	RING	TRIM	assorted CTD	IPR001841	(none noted)	Q6ZRF8	388591	C1orf188	634	70861
TRIM31	E3 ubiquitin-protein ligase TRIM31	UPS	E3 ligase	RING	TRIM	assorted CTD	IPR001841	(none noted)	Q9BZY9	11074	C6orf13 RNF	425	48244
TRIM8	E3 ubiquitin-protein ligase TRIM8	UPS	E3 ligase	RING	TRIM	assorted CTD	IPR001841	(none noted)	Q9BZR9	81603	GERP RNF27	551	61489
TRIM73	Tripartite motif-containing protein 73	UPS	E3 ligase	RING	TRIM	no CTD	IPR001841, IPR027370	(none noted)	Q86UV7	375593	TRIM50B	250	28517
TRIM74	Tripartite motif-containing protein 74	UPS	E3 ligase	RING	TRIM	no CTD	IPR001841, IPR027370	(none noted)	Q86UV6	378108	TRIM50C	250	28547
RNF187	E3 ubiquitin-protein ligase RNF187	UPS	E3 ligase	RING	TRIM	no CTD	IPR001841	(none noted)	Q5TA31	149603		235	26190
TRIM48	E3 ubiquitin-protein ligase TRIM48	UPS	E3 ligase	RING	TRIM	no CTD	IPR001841	(none noted)	Q8IWZ4	79097	RNF101	224	26409
TRIM61	Putative tripartite motif-containing protein 61	UPS	E3 ligase	RING	TRIM	no CTD & short central helix	IPR001841	(none noted)	Q5EBN2	391712	RNF35	209	24047
TRIM52	E3 ubiquitin-protein ligase TRIM52	UPS	E3 ligase	RING	TRIM	no CTD & short central helix	IPR001841	(none noted)	Q96A61	84851	RNF102	297	34653
TRIM40	E3 ubiquitin ligase TRIM40	UPS	E3 ligase	RING	TRIM	no CTD & folded helix	IPR001841, IPR027370	(none noted)	Q6P9F5	135644	RNF35	258	29336
MEFV	Pyrin	UPS	E3 ligase	RING	TRIM	Pyrin, ringless, SPRY	(none noted)	IPR004020, IPR001870	O15553	4210	MEF TRIM20	781	86444
CMYA5	Cardiomyopathy-associated protein 5	UPS	E3 ligase	RING	TRIM	ringless & FN & SPRY	(none noted)	IPR001870, IPR013783	Q8N3K9	202333	C5orf10 DTNBP2 SPRYD2 TRIM76	4069	449211
TRIM14	Tripartite motif-containing protein 14	UPS	E3 ligase	RING	TRIM	ringless & SPRY	(none noted)	IPR001870	Q14142	9830	KIAA0129	442	49773
TRIM16	Tripartite motif-containing protein 16	UPS	E3 ligase	RING	TRIM	ringless & SPRY	(none noted)	IPR001870	O95361	10626	EBBP	564	63955
TRIM16L	Tripartite motif-containing protein 16-like protein	UPS	E3 ligase	RING	TRIM	ringless & SPRY & folded central helix	(none noted)	IPR001870	Q309B1	147166	TRIM70	348	40306
TRIML2	Probable E3 ubiquitin-protein ligase TRIML2	UPS	E3 ligase	RING	TRIM	ringless & SPRY & folded central helix	(none noted)	IPR001870	Q8N7C3	205860	SPRYD6	437	49893
TRIM66	Tripartite motif-containing protein 66	UPS	E3 ligase	RING	TRIM	ringless & assorted CTD	(none noted)	(none noted)	O15016	9866	C11orf29 KIAA0298	1351	149469
TRIM29	Tripartite motif-containing protein 29	UPS	E3 ligase	RING	TRIM	ringless & assorted CTD	(none noted)	(none noted)	Q14134	23650	ATDC	588	65835
TRIM44	Tripartite motif-containing protein 44	UPS	E3 ligase	RING	TRIM	ringless & no CTD	(none noted)	(none noted)	Q96DX7	54765	DIPB	344	38472
RFPL1	Ret finger protein-like 1	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	O75677	5988	RFPL1L RNF78	317	35491
RFPL2	Ret finger protein-like 2	UPS	E3 ligase	RING	SPRY but not TRIM		(IPR013083)	IPR001870	O75678	10739	RNF79	378	42077
RFPL3	Ret finger protein-like 3	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	O75679	10738		317	35386
RFPL4A	Ret finger protein-like 4A	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	A6NLU0	342931	RFPL4 RNF210	287	32238
RFPL4B	Ret finger protein-like 4B	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	Q6ZWI9	442247	RNF211	263	29922
RFPL4AL1	Ret finger protein-like 4A-like protein 1	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	F8VTS6	729974		287	32249
RNF39	RING finger protein 39	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	Q9H2S5	80352	HZFW	420	45525
RNF123	E3 ubiquitin-protein ligase RNF123	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	Q5XPI4	63891	KPC1	1314	148515
RNF135	E3 ubiquitin-protein ligase RNF135	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	Q8IUD6	84282		432	47888
RSPRY1	RING finger and SPRY domain-containing protein 1	UPS	E3 ligase	RING	SPRY but not TRIM		IPR001841	IPR001870	Q96DX4	89970	KIAA1972	576	64180

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
BIRC2	Baculoviral IAP repeat-containing protein 2	UPS	E3 ligase	RING	BIRC / IAP	BIR repeat	IPR001841	IPR001370	Q13490	329	API1 MIHB RNF48	618	69900
BIRC3	Baculoviral IAP repeat-containing protein 3	UPS	E3 ligase	RING	BIRC / IAP	BIR repeat	IPR001841	IPR001370	Q13489	330	API2 MIHC RNF49	604	68372
BIRC7	Baculoviral IAP repeat-containing protein 7	UPS	E3 ligase	RING	BIRC / IAP	BIR repeat	IPR001841	IPR001370	Q96CA5	79444	KIAP LIVIN MLIAP RNF50	298	32798
BIRC8	Baculoviral IAP repeat-containing protein 8	UPS	E3 ligase	RING	BIRC / IAP	BIR repeat	IPR001841	IPR001370	Q96P09	112401	ILP2	236	27089
XIAP	E3 ubiquitin-protein ligase XIAP	UPS	E3 ligase	RING	BIRC / IAP	BIR repeat	IPR001841	IPR001370	P98170	331	API3 BIRC4 IAP3	497	56685
BRCA1	Breast cancer type 1 susceptibility protein	UPS	E3 ligase	RING	BRCA1		IPR001841	IPR025994, IPR001357	P38398	672	RNF53	1863	207721
BARD1	BRCA1-associated RING domain protein 1	UPS	E3 ligase	RING	BRCA1-associated		IPR001841	IPR001357, IPR036770	Q99728	580		777	86648
BRAP	BRCA1-associated protein	UPS	E3 ligase	RING	BRCA1-associated		IPR001841	IPR011422, IPR001607	Q7Z569	8315	RNF52	592	67305
CBL	E3 ubiquitin-protein ligase CBL	UPS	E3 ligase	RING	CBL, UBA		IPR001841	IPR024159, IPR015940	P22681	867	CBL2 RNF55	906	99633
CBLB	E3 ubiquitin-protein ligase CBL-B LIZARD	UPS	E3 ligase	RING	CBL, UBA		IPR001841	IPR024159, IPR015940	Q13191	868	RNF56	982	109450
CBLC	E3 ubiquitin-protein ligase CBL-C	UPS	E3 ligase	RING	CBL		IPR001841	IPR024159	Q9ULV8	23624	CBL3 RNF57	474	52456
RNF146	E3 ubiquitin-protein ligase RNF146	UPS	E3 ligase	RING	Deltex		IPR001841	IPR004170	Q9NTX7	81847		359	38950
DTX1	E3 ubiquitin-protein ligase DTX1	UPS	E3 ligase	RING	Deltex		IPR001841	IPR004170, IPR039396	Q86Y01	1840		620	67368
DTX2	Probable E3 ubiquitin-protein ligase DTX2	UPS	E3 ligase	RING	Deltex		IPR001841	IPR004170, IPR039396	Q86UW9	113878	KIAA1528 RNF58	622	67246
DTX4	E3 ubiquitin-protein ligase DTX4	UPS	E3 ligase	RING	Deltex		IPR001841	IPR004170, IPR039396	Q9Y2E6	23220	KIAA0937 RNF155	619	67258
DTX3	Probable E3 ubiquitin-protein ligase DTX3	UPS	E3 ligase	RING	Deltex		IPR001841	IPR039396	Q8N9I9	196403	RNF154	347	37988
DTX3L	E3 ubiquitin-protein ligase DTX3L	UPS	E3 ligase	RING	Deltex		IPR001841	IPR039396	Q8TDB6	151636	BBAP	740	83554
RNF13	E3 ubiquitin-protein ligase RNF13	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	O43567	11342	RZF	381	42814
RNF128	E3 ubiquitin-protein ligase RNF128	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q8TEB7	79589		428	46521
RNF130	E3 ubiquitin-protein ligase RNF130	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q86XS8	55819		419	46405
RNF133	E3 ubiquitin-protein ligase RNF133	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q8WVZ7	168433		376	42294
RNF148	RING finger protein 148	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q8N7C7	378925		305	34397
RNF149	E3 ubiquitin-protein ligase RNF149	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q8NC42	284996	DNAPTP2	400	43165
RNF150	RING finger protein 150	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q9ULK6	57484	KIAA1214	438	48072
RNF167	E3 ubiquitin-protein ligase RNF167	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q9H6Y7	26001		350	38299
ZNRF4	E3 ubiquitin-protein ligase ZNRF4	UPS	E3 ligase	RING	Goliath		IPR001841	IPR003137	Q8WWF5	148066	RNF204	429	46958
CBLL1	E3 ubiquitin-protein ligase Hakai	UPS	E3 ligase	RING	Hakai		IPR001841	IPR040380	Q75N03	79872	HAKAI RNF188	491	54519
CBLL2	E3 ubiquitin-protein ligase CBLL2	UPS	E3 ligase	RING	Hakai		IPR001841	IPR040380	Q8N7E2	158506	ZNF645	425	48785
IRF2BP1	Interferon regulatory factor 2-binding protein 1	UPS	E3 ligase	RING	IRF2 binding		IPR044882	IPR022750	Q8IU81	26145		584	61688
IRF2BP2	Interferon regulatory factor 2-binding protein 2	UPS	E3 ligase	RING	IRF2 binding		IPR044882	IPR022750	Q7Z5L9	359948		587	61025
IRF2BPL	Probable E3 ubiquitin-protein ligase IRF2BPL	UPS	E3 ligase	RING	IRF2 binding		IPR044882	IPR022750	Q9H1B7	64207	C14orf4 EAP1 KIAA1865	796	82659
LONRF1	LON peptidase N-terminal domain and RING finger protein 1	UPS	E3 ligase	RING	LON	TPR	IPR001841, IPR027370	IPR003111, IPR011990, IPR019734	Q17RB8	91694	RNF191	773	86725
LONRF2	LON peptidase N-terminal domain and RING finger protein 2	UPS	E3 ligase	RING	LON	TPR	IPR001841, IPR027370	IPR003111, IPR011990, IPR019734	Q1L5Z9	164832	RNF192	754	83654
LONRF3	LON peptidase N-terminal domain and RING finger protein 3	UPS	E3 ligase	RING	LON	TPR	IPR001841, IPR027370	IPR003111, IPR011990, IPR019734	Q496Y0	79836	RNF127	759	84490
MKRN1	E3 ubiquitin-protein ligase makorin-1	UPS	E3 ligase	RING	Makorin		IPR001841	IPR031644	Q9UHC7	23608	RNF61	482	53349
MKRN3	Probable E3 ubiquitin-protein ligase makorin-3	UPS	E3 ligase	RING	Makorin		IPR001841	IPR031644	Q13064	7681	D15S9 RNF63 ZNF127	507	55645
MKRN2	E3 ubiquitin-protein ligase makorin-2	UPS	E3 ligase	RING	Makorin		IPR001841	(none noted)	Q9H000	23609	RNF62	416	46940
MARCHF1	E3 ubiquitin-protein ligase MARCHF1	UPS	E3 ligase	RING	MARCH		IPR011016, IPR001841	(none noted)	Q8TCQ1	55016	MARCH1 RNF171	289	32308
MARCHF2	E3 ubiquitin-protein ligase MARCHF2	UPS	E3 ligase	RING	MARCH		IPR011016, IPR001841	(none noted)	Q9P0N8	51257	MARCH2 RNF172	246	26995
MARCHF3	E3 ubiquitin-protein ligase MARCHF3	UPS	E3 ligase	RING	MARCH		IPR011016, IPR001841	(none noted)	Q86UD3	115123	MARCH3 RNF173	253	28504
MARCHF4	E3 ubiquitin-protein ligase MARCHF4	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	Q9P2E8	57574	KIAA1399 MARCH4 RNF174	410	45528
MARCHF5	E3 ubiquitin-protein ligase MARCHF5	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	Q9NX47	54708	MARCH5 RNF153	278	31232
MARCHF6	E3 ubiquitin-protein ligase MARCHF6	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	O60337	10299	KIAA0597 MARCH6 RNF176 TEB4	910	102545
MARCHF7	E3 ubiquitin-protein ligase MARCHF7	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	Q9H992	64844	AXOT MARCH7 RNF177	704	78051
MARCHF8	E3 ubiquitin-protein ligase MARCHF8	UPS	E3 ligase	RING	MARCH		IPR011016, IPR001841	(none noted)	Q5T0T0	220972	MARCH8 MIR RNF178	291	32965
MARCHF9	E3 ubiquitin-protein ligase MARCHF9	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	Q86YJ5	92979	MARCH9 RNF179	346	37772
MARCHF10	Probable E3 ubiquitin-protein ligase MARCHF10	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	Q8NA82	162333	MARCH10 RNF190	808	90511
MARCHF11	E3 ubiquitin-protein ligase MARCHF11	UPS	E3 ligase	RING	MARCH		IPR011016	(none noted)	A6NNE9	441061	MARCH11	402	43878
MDM2	E3 ubiquitin-protein ligase Mdm2	UPS	E3 ligase	RING	Mdm		IPR001841	IPR001876, IPR003121	Q00987	4193		491	55233
MDM4	Protein Mdm4	UPS	E3 ligase	RING	Mdm		IPR001841	IPR001876, IPR003121	O15151	4194	MDMX	490	54864
MEX3A	RNA-binding protein MEX3A	UPS	E3 ligase	RING	MEX3		IPR001841	IPR004087	A1L020	92312	RKHD4	520	54173
MEX3B	RNA-binding protein MEX3B	UPS	E3 ligase	RING	MEX3		IPR001841	IPR004087	Q6ZN04	84206	KIAA2009 RKHD3 RNF195	569	58832
MEX3C	RNA-binding E3 ubiquitin-protein ligase MEX3C	UPS	E3 ligase	RING	MEX3		IPR001841	IPR004087	Q5U5Q3	51320	RKHD2 RNF194	659	69366
MEX3D	RNA-binding protein MEX3D	UPS	E3 ligase	RING	MEX3		IPR001841	IPR004087	Q86XN8	399664	KIAA2031 RKHD1 RNF193	651	64883

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
MIB1	E3 ubiquitin-protein ligase MIB1	UPS	E3 ligase	RING	Mindbomb		IPR001841	IPR010606, IPR040847	Q86YT6	57534	DIP1 KIAA1323 ZZANK2	1006	110136
MIB2	E3 ubiquitin-protein ligase MIB2	UPS	E3 ligase	RING	Mindbomb		IPR001841	IPR010606, IPR040847	Q96AX9	142678	SKD ZZANK1	955	103658
NFX1	Transcriptional repressor NF-X1	UPS	E3 ligase	RING	NFX		IPR001841	IPR000967	Q12986	4799	NFX2	1120	124395
NFXL1	NF-X1-type zinc finger protein NFXL1	UPS	E3 ligase	RING	NFX		IPR001841	IPR000967	Q6ZNB6	152518	OZFP	911	101339
NEURL1	E3 ubiquitin-protein ligase NEURL1	UPS	E3 ligase	RING	Neuralized	SPRY / NHR	IPR001841	IPR006573, IPR043136	O76050	9148	NEURL NEURL1A RNF67	574	61860
NEURL1B	E3 ubiquitin-protein ligase NEURL1B	UPS	E3 ligase	RING	Neuralized	SPRY / NHR	IPR001841	IPR006573, IPR043136	A8MQ27	54492	NEURL3	555	59270
NEURL3	E3 ubiquitin-protein ligase NEURL3	UPS	E3 ligase	RING	Neuralized	SPRY / NHR	IPR001841	IPR006573, IPR043136	Q96EH8	93082	LINCR	262	28789
LNX1	E3 ubiquitin-protein ligase LNX	UPS	E3 ligase	RING	PDZ		IPR001841	IPR001478	Q8TBB1	84708	LNX PDZRN2	728	80629
LNX2	Ligand of Numb protein X 2	UPS	E3 ligase	RING	PDZ		IPR001841	IPR001478	Q8N448	222484	PDZRN1	690	76004
PDZRN4	PDZ domain-containing RING finger protein 4	UPS	E3 ligase	RING	PDZ		IPR001841	IPR001478	Q6ZMN7	29951	LNX4 SEMCAP3L	1036	117103
PDZRN3	E3 ubiquitin-protein ligase PDZRN3	UPS	E3 ligase	RING	PDZ	TRAF-type ZnF	IPR001841	IPR001478, IPR001293	Q9UPQ7	23024	KIAA1095 LNX3 SEMCAP3	1066	119596
PELI1	E3 ubiquitin-protein ligase pellino homolog 1	UPS	E3 ligase	RING	Pellino		PMID: 17675297	(none noted)	Q96FA3	57162	PRISM	418	46286
PELI2	E3 ubiquitin-protein ligase pellino homolog 2	UPS	E3 ligase	RING	Pellino		PMID: 17675297	(none noted)	Q9HAT8	57161		420	46435
PELI3	E3 ubiquitin-protein ligase pellino homolog 3	UPS	E3 ligase	RING	Pellino		PMID: 17675297	(none noted)	Q8N2H9	246330		469	50755
PEX2	Peroxisome biogenesis factor 2	UPS	E3 ligase	RING	PEX		IPR001841	IPR006845	P28328	5828	PAF1 PMP3 PMP35 PXMP3 RNF72	305	34843
PEX10	Peroxisome biogenesis factor 10	UPS	E3 ligase	RING	PEX		IPR001841	IPR006845	O60683	5192	RNF69	326	37069
PEX12	Peroxisome assembly protein 12	UPS	E3 ligase	RING	PEX		cd16451	IPR006845	O00623	5193	PAF3	359	40797
BMI1	Polycomb complex protein BMI-1	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	P35226	648	PCGF4 RNF51	326	36949
PCGF1	Polycomb group RING finger protein 1	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	Q9BSM1	84759	NSPC1 RNF68	259	30346
PCGF2	Polycomb group RING finger protein 2	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	P35227	7703	MEL18 RNF110 ZNF144	344	37788
PCGF3	Polycomb group RING finger protein 3	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	Q3KNV8	10336	RNF3 RNF3A	242	28115
PCGF5	Polycomb group RING finger protein 5	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	Q86SE9	84333	RNF159	256	29714
PCGF6	Polycomb group RING finger protein 6	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR046979	Q9BYE7	84108	MBLR RNF134	350	39047
RING1	E3 ubiquitin-protein ligase RING1	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	Q06587	6015	RNF1	406	42429
RNF2	E3 ubiquitin-protein ligase RING2	UPS	E3 ligase	RING	Polycomb		IPR001841	IPR032443	Q99496	6045	BAP1 DING HIPI3 RING1B	336	37655
PJA1	E3 ubiquitin-protein ligase Praja-1	UPS	E3 ligase	RING	Praja		IPR001841	(none noted)	Q8NG27	64219	RNF70	643	71002
PJA2	E3 ubiquitin-protein ligase Praja-2	UPS	E3 ligase	RING	Praja		IPR001841	(none noted)	O43164	9867	KIAA0438 RNF131	708	78214
RNF20	E3 ubiquitin-protein ligase BRE1A	UPS	E3 ligase	RING	RNF20/40 ish		IPR001841	(none noted)	Q5VTR2	56254	BRE1A	975	113662
RNF40	E3 ubiquitin-protein ligase BRE1B	UPS	E3 ligase	RING	RNF20/40 ish		IPR001841	(none noted)	O75150	9810	BRE1B KIAA0661	1001	113678
RC3H1	Roquin-1	UPS	E3 ligase	RING	Roquin		IPR001841, IPR027370	IPR041523	Q5TC82	149041	KIAA2025 RNF198	1133	125736
RC3H2	Roquin-2	UPS	E3 ligase	RING	Roquin		IPR001841, IPR027370	IPR041523	Q9HBD1	54542	MNAB RNF164	1191	131669
RAD18	E3 ubiquitin-protein ligase RAD18	UPS	E3 ligase	RING	SAP		IPR001841	IPR036361	Q9NS91	56852	RNF73	495	56223
RFFL	E3 ubiquitin-protein ligase rififylin	UPS	E3 ligase	RING	SAP		IPR001841	IPR036361	Q8WZ73	117584	RNF189 RNF34L	363	40514
RNF34	E3 ubiquitin-protein ligase RNF34	UPS	E3 ligase	RING	SAP		IPR001841	IPR036361	Q969K3	80196		372	41641
SH3RF1	E3 ubiquitin-protein ligase SH3RF1	UPS	E3 ligase	RING	SH3		IPR001841	IPR001452	Q7Z6J0	57630	KIAA1494 POSH POSH1 RNF142 SH3MD2	888	93129
SH3RF2	E3 ubiquitin-protein ligase SH3RF2	UPS	E3 ligase	RING	SH3		IPR001841, IPR027370	IPR001452	Q8TEC5	153769	POSH3 POSHER PPP1R39 RNF158	729	79320
SH3RF3	E3 ubiquitin-protein ligase SH3RF3	UPS	E3 ligase	RING	SH3		IPR001841	IPR001452	Q8TEJ3	344558	POSH2 SH3MD4	882	92776
SIAH1	E3 ubiquitin-protein ligase SIAH1	UPS	E3 ligase	RING	SIAH-type ZnF, SIA TRAF-like domain		IPR001841	IPR013010, IPR018121	Q8IUQ4	6477	HUMSIAH	282	31123
SIAH2	E3 ubiquitin-protein ligase SIAH2	UPS	E3 ligase	RING	SIAH-type ZnF, SIA TRAF-like domain		IPR001841	IPR013010, IPR018121	O43255	6478		324	34615
SIAH3	Seven in absentia homolog 3	UPS	E3 ligase	RING	SIA TRAF-like domain		(none noted)	IPR018121	Q8IW03	283514		269	30660
RNF151	RING finger protein 151	UPS	E3 ligase	RING	SIAH-type ZnF	TRAF-type ZnF	IPR001841	IPR013010, IPR001293	Q2KHN1	146310		245	27412
RNF41	E3 ubiquitin-protein ligase NRDP1	UPS	E3 ligase	RING	SIAH-type ZnF		IPR001841	IPR013010, IPR015036	Q9H4P4	10193	FLRF NRDP1	317	35905
TRAF2	TNF receptor-associated factor 2	UPS	E3 ligase	RING	TRAF-type ZnF, MATH/TRAF		IPR001841	IPR001293, IPR002083	Q12933	7186	TRAP3	501	55859
TRAF3	TNF receptor-associated factor 3	UPS	E3 ligase	RING	TRAF-type ZnF, MATH/TRAF		IPR001841	IPR001293, IPR002083	Q13114	7187	CAP1 CRAF1	568	64490
TRAF4	TNF receptor-associated factor 4	UPS	E3 ligase	RING	TRAF-type ZnF, MATH/TRAF		IPR001841	IPR001293, IPR002083	Q9BUZ4	9618	CART1 MLN62 RNF83	470	53543
TRAF5	TNF receptor-associated factor 5	UPS	E3 ligase	RING	TRAF-type ZnF, MATH/TRAF		IPR001841	IPR001293, IPR002083	O00463	7188	RNF84	557	64406
TRAF6	TNF receptor-associated factor 6	UPS	E3 ligase	RING	TRAF-type ZnF, MATH/TRAF		IPR001841	IPR001293, IPR002083	Q9Y4K3	7189	RNF85	522	59573
TRAF7	E3 ubiquitin-protein ligase TRAF7	UPS	E3 ligase	RING	TRAF-type ZnF	WD40	IPR001841	IPR001293, IPR015943, IPR036322	Q6Q0C0	84231	RFWD1 RNF119	670	74609
RNF114	E3 ubiquitin-protein ligase RNF114	UPS	E3 ligase	RING	TRAC-1		IPR001841, IPR027370	IPR008598, IPR027370	Q9Y508	55905	ZNF228 ZNF313	228	25694
RNF125	E3 ubiquitin-protein ligase RNF125	UPS	E3 ligase	RING	TRAC-1		IPR001841	IPR008598	Q96EQ8	54941		232	26454
RNF138	E3 ubiquitin-protein ligase RNF138	UPS	E3 ligase	RING	TRAC-1		IPR001841	IPR008598	Q8WVD3	51444	NARF	245	28193
RNF166	E3 ubiquitin-protein ligase RNF166	UPS	E3 ligase	RING	TRAC-1		IPR001841	IPR008598	Q96A37	115992		237	26122
KCMF1	E3 ubiquitin-protein ligase KCMF1	UPS	E3 ligase	RING	TRAC-1		(none noted)	IPR008598	Q9P0J7	56888	FIGC ZZZ1	381	41945

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
PRPF19	Pre-mRNA-processing factor 19	UPS	E3 ligase	RING	UBOX	WD40	IPR003613	IPR015943, IPR036322	Q9UMS4	27339	NMP200 PRP19 SNEV	504	55181
WDSUB1	WD repeat	UPS	E3 ligase	RING	UBOX	WD40	IPR003613	IPR015943	Q8N9V3	151525	WDSAM1	476	52833
PPIL2	RING-type E3 ubiquitin-protein ligase PPIL2	UPS	E3 ligase	RING	UBOX		IPR003613	IPR002130, IPR011990	Q13356	23759		520	58823
STUB1	E3 ubiquitin-protein ligase CHIP	UPS	E3 ligase	RING	UBOX		IPR003613	IPR041312	Q9UNE7	10273	CHIP	303	34856
UBE4A	Ubiquitin conjugation factor E4 A	UPS	E3 ligase	RING	UBOX		IPR003613	IPR019474	Q14139	9354	KIAA0126	1066	122561
UBE4B	Ubiquitin conjugation factor E4 B	UPS	E3 ligase	RING	UBOX		IPR003613	IPR019474	O95155	10277	HDNB1 KIAA0684 UFD2	1302	146185
RBBP6	E3 ubiquitin-protein ligase RBBP6	UPS	E3 ligase	RING	UBOX		IPR003613, IPR001841	IPR014891	Q7Z6E9	5930	P2PR PACT RBQ1	1792	201564
UBOX5	RING finger protein 37	UPS	E3 ligase	RING	UBOX		IPR003613, IPR001841	IPR045696	O94941	22888	KIAA0860 RNF37 UBCE7IP5 UIP5	541	58966
TRIM21	E3 ubiquitin-protein ligase TRIM21	UPS	E3 ligase	RING	UBOX	also TRIM (SPRY)	IPR003613, IPR001841	IPR001870	P19474	6737	RNF81 RO52 SSA1	475	54170
NOSIP	Nitric oxide synthase-interacting protein	UPS	E3 ligase	RING	UBOX	split UBOX	PMID: 12746455	IPR031790	Q9Y314	55120		301	33172
UBR1	E3 ubiquitin-protein ligase UBR1	UPS	E3 ligase	RING	UBR		IPR003126	IPR003769, IPR044046	Q8IWV7	197131		1749	200211
UBR2	E3 ubiquitin-protein ligase UBR2	UPS	E3 ligase	RING	UBR		IPR003126	IPR003769, IPR044046	Q8IWV8	23304	C6orf133 KIAA0349	1755	200538
UBR3	E3 ubiquitin-protein ligase UBR3	UPS	E3 ligase	RING	UBR		IPR003126	IPR044046	Q6ZT12	130507	KIAA2024 ZNF650	1888	212433
UBR4	E3 ubiquitin-protein ligase UBR4	UPS	E3 ligase	RING	UBR		IPR003126	IPR025704, IPR045841, IPR036322	Q5T4S7	23352	KIAA0462 KIAA1307 RBAF600 ZUBR1	5183	573841
UBR7	Putative E3 ubiquitin-protein ligase UBR7	UPS	E3 ligase	RING	UBR		IPR003126	IPR011011	Q8N806	55148	C14orf130	425	47999
UHRF1	E3 ubiquitin-protein ligase UHRF1	UPS	E3 ligase	RING	UHRF, UBL	PHD-type ZnF	IPR001841	IPR021991, IPR000626, IPR003105, IPR001965	Q96T88	29128	ICBP90 NP95 RNF106	793	89814
UHRF2	E3 ubiquitin-protein ligase UHRF2	UPS	E3 ligase	RING	UHRF, UBL	PHD-type ZnF	IPR001841	IPR021991, IPR000626, IPR003105, IPR001965	Q96PU4	115426	NIRF RNF107	802	89985
UNK	RING finger protein unkempt homolog	UPS	E3 ligase	RING	Unkempt		cd16771	IPR040594	Q9C0B0	85451	KIAA1753 ZC3H5 ZC3HDC5	810	88084
UNKL	Putative E3 ubiquitin-protein ligase UNKL	UPS	E3 ligase	RING	Unkempt		IPR001841	IPR040594	Q9H9P5	64718	C16orf28 ZC3H5L ZC3HDC5L	680	73828
VPS8	Vacuolar protein sorting-associated protein 8 homolog	UPS	E3 ligase	RING	VPS-associated	WD40	IPR001841	IPR015943, IPR036322	Q8N3P4	23355	KIAA0804	1428	161754
VPS11	Vacuolar protein sorting-associated protein 11 homolog	UPS	E3 ligase	RING	VPS-associated	WD40	IPR001841	IPR011990, IPR015943, IPR036322	Q9H270	55823	RNF108	941	107837
VPS41	Vacuolar protein sorting-associated protein 41 homolog	UPS	E3 ligase	RING	VPS-associated	WD40	IPR001841	IPR011990, IPR015943, IPR036322	P49754	27072		854	98566
ZNRF1	E3 ubiquitin-protein ligase ZNRF1	UPS	E3 ligase	RING	ZNRF		IPR001841	(none noted)	Q8ND25	84937	NIN283	227	23783
ZNRF2	E3 ubiquitin-protein ligase ZNRF2	UPS	E3 ligase	RING	ZNRF		IPR001841	(none noted)	Q8NHG8	223082	RNF202	242	24115
LTN1	E3 ubiquitin-protein ligase listerin	UPS	E3 ligase	RING	other	Armadillo-like	IPR001841	IPR011989	O94822	26046	C21orf10 C21orf98 KIAA0714 RNF160 ZNF294	1766	200552
MAP3K1	Mitogen-activated protein kinase kinase kinase 1	UPS	E3 ligase	RING	other	Armadillo-like, SWIM-type ZnF	IPR001841	IPR011989, IPR007527	Q13233	4214	MAPKKK1 MEKK MEKK1	1512	164470
ZSWIM2	E3 ubiquitin-protein ligase ZSWIM2	UPS	E3 ligase	RING	other	SWIM-type ZnF	IPR001841	IPR007527	Q8NEG5	151112	ZZZ2	633	72732
AMFR	E3 ubiquitin-protein ligase AMFR	UPS	E3 ligase	RING	other	CUE	IPR001841	IPR003892, IPR040675	Q9UKV5	267	RNF45	643	72996
PHRF1	PHD and RING finger domain-containing protein 1	UPS	E3 ligase	RING	other	PHD-type ZnF	IPR001841	IPR001965	Q9P1Y6	57661	KIAA1542	1649	178666
SHPRH	E3 ubiquitin-protein ligase SHPRH	UPS	E3 ligase	RING	other	helicase, PHD-type ZnF	IPR001841	IPR027417, IPR001965	Q149N8	257218	KIAA2023	1683	193079
HLTF	Helicase-like transcription factor	UPS	E3 ligase	RING	other	helicase	IPR001841	IPR027417, IPR014001	Q14527	6596	HIP116A RNF80 SMARCA3 SNF2L3 ZBU1	1009	113929
RNF112	RING finger protein 112	UPS	E3 ligase	RING	other	P-loop NTP hydrolase	IPR001841	IPR027417	Q9ULX5	7732	BFP ZNF179	631	68298
RNF213	E3 ubiquitin-protein ligase RNF213	UPS	E3 ligase	RING	other	P-loop NTP hydrolase	IPR001841	IPR027417	Q63HN8	57674	ALO17 C17orf27 KIAA1554 KIAA1618 MYSTR	5207	591407
RNF32	RING finger protein 32	UPS	E3 ligase	RING	other	IQ motif	IPR001841, IPR027370	IPR000048	Q9H0A6	140545		362	41516
LRSAM1	E3 ubiquitin-protein ligase LRSAM1	UPS	E3 ligase	RING	other	LRR	IPR001841	IPR032675	Q6UWE0	90678	TAL	723	83594
NHLRC1	E3 ubiquitin-protein ligase NHLRC1	UPS	E3 ligase	RING	other	NHL repeat	IPR001841	IPR001258	Q6VVB1	378884	EPM2B	395	42293
CNOT4	CCR4-NOT transcription complex subunit 4	UPS	E3 ligase	RING	other	RNA recognition motif	IPR001841	IPR000504	O95628	4850	NOT4	575	63510
RNF25	E3 ubiquitin-protein ligase RNF25	UPS	E3 ligase	RING	other	RWD	IPR001841	IPR006575	Q96BH1	64320		459	51219
TTC3	E3 ubiquitin-protein ligase TTC3	UPS	E3 ligase	RING	other	TPR	IPR001841	IPR011990	P53804	7267	DCRR1 RNF105 TPRD	2025	229869
RAPSN	43 kDa receptor-associated protein of the synapse	UPS	E3 ligase	RING	other	TPR	IPR001841	IPR011990	Q13702	5913	RNF205	412	46328
MYLIP	E3 ubiquitin-protein ligase MYLIP	UPS	E3 ligase	RING	other	UBL	IPR001841	cd17104	Q8WY64	29116	BZF1 IDOL	445	49910
MNAT1	CDK-activating kinase assembly factor MAT1	UPS	E3 ligase	RING	other	UIM	IPR001841	IPR003903	P51948	4331	CAP35 MAT1 RNF66	309	35823
RFWD3	E3 ubiquitin-protein ligase RFWD3	UPS	E3 ligase	RING	other	WD40	IPR001841	IPR015943, IPR036322	Q6PCD5	55159	RNF201	774	85094
FANCL	E3 ubiquitin-protein ligase FANCL	UPS	E3 ligase	RING	other	WD40	IPR026850	IPR016135, IPR019162	Q9NW38	55120	PHF9	375	42905
BFAR	Bifunctional apoptosis regulator	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9NZS9	51283	BAR RNF47	450	52738
CCNB1IP1	E3 ubiquitin-protein ligase CCNB1IP1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9NPC3	57820	C14orf18 HEI10	277	31544
CGRRF1	Cell growth regulator with RING finger domain protein 1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q99675	10668	CGR19 RNF197	332	38242
CHFR	E3 ubiquitin-protein ligase CHFR	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96EP1	55743	RNF196	664	73386
DCST1	E3 ubiquitin-protein ligase DCST1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q5T197	149095		706	80712
DZIP3	E3 ubiquitin-protein ligase DZIP3	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q86Y13	9666	KIAA0675	1208	138604
MGRN1	E3 ubiquitin-protein ligase MGRN1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	O60291	23295	KIAA0544 RNF156	552	60753
MSL2	E3 ubiquitin-protein ligase MSL2	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9HCI7	55167	KIAA1585 MSL2L1 RNF184	577	62541
MUL1	Mitochondrial ubiquitin ligase activator of NFKB 1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q969V5	79594	C1orf166 GIDE MAPL MULAN RNF218	352	39800
MYCBP2	E3 ubiquitin-protein ligase MYCBP2	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	O75592	23077	KIAA0916 PAM	4678	513636

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
NSMCE1	Non-structural maintenance of chromosomes element 1 homolog	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8WV22	197370		266	30855
OBI1	ORC ubiquitin ligase 1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q5W0B1	79596	C13orf7 RNF219	726	81116
RAG1	V(D)J recombination-activating protein 1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	P15918	5896	RNF74	1043	119097
RCHY1	RING finger and CHY zinc finger domain-containing protein 1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96PM5	25898	ARNIP CHIMP PIRH2 RNF199 ZNF363	261	30110
RLIM	E3 ubiquitin-protein ligase RLIM	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9NVW2	51132	RNF12	624	68549
RNF4	E3 ubiquitin-protein ligase RNF4	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	P78317	6047	SNURF	190	21319
RNF5	E3 ubiquitin-protein ligase RNF5	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q99942	6048	G16 NG2 RMA1	180	19881
RNF6	E3 ubiquitin-protein ligase RNF6	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9Y252	6049	SPG2	685	78091
RNF8	E3 ubiquitin-protein ligase RNF8	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	O76064	9025	KIAA0646	485	55518
RNF10	RING finger protein 10	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8N5U6	9921	KIAA0262 RIE2	811	89927
RNF11	RING finger protein 11	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9Y3C5	26994		154	17444
RNF17	RING finger protein 17	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9BXT8	56163	TDRD4	1623	184643
RNF24	RING finger protein 24	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9Y225	11237		148	17210
RNF26	E3 ubiquitin-protein ligase RNF26	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9BY78	79102		433	47737
RNF38	E3 ubiquitin-protein ligase RNF38	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9H0F5	152006		515	57595
RNF43	E3 ubiquitin-protein ligase RNF43	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q68DV7	54894		783	85722
RNF44	RING finger protein 44	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q7L0R7	22838	KIAA1100	432	47728
RNF111	E3 ubiquitin-protein ligase Arkadia LIZARD	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q6ZNA4	54778		994	108862
RNF103	E3 ubiquitin-protein ligase RNF103	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	O00237	7844	ZFP103	685	79405
RNF113A	E3 ubiquitin-protein ligase RNF113A	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	O15541	7737	RNF113 ZNF183	343	38787
RNF113B	RING finger protein 113B	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8IZP6	140432	RNF161 ZNF183L1	322	36259
RNF115	E3 ubiquitin-protein ligase RNF115	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9Y4L5	27246	ZNF364	304	33703
RNF121	RING finger protein 121	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9H920	55298		327	37882
RNF122	RING finger protein 122	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9H9V4	79845		155	17475
RNF126	E3 ubiquitin-protein ligase RNF126	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9BV68	55658		311	33861
RNF139	E3 ubiquitin-protein ligase RNF139	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8WU17	11236	TRC8	664	75994
RNF141	RING finger protein 141	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8WVD5	50862	ZNF230	230	25535
RNF145	RING finger protein 145	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96MT1	153830		663	75617
RNF152	E3 ubiquitin-protein ligase RNF152	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8N8N0	220441		203	22357
RNF157	E3 ubiquitin ligase RNF157	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96PX1	114804	KIAA1917	679	73579
RNF165	E3 ubiquitin-protein ligase RNF165	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q6ZSG1	494470		346	39526
RNF168	E3 ubiquitin-protein ligase RNF168	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8IYW5	165918		571	65020
RNF169	E3 ubiquitin-protein ligase RNF169	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8NCN4	254225	KIAA1991	708	77194
RNF170	E3 ubiquitin-protein ligase RNF170	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96K19	81790		258	29815
RNF175	RING finger protein 175	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8N4F7	285533		328	38266
RNF180	E3 ubiquitin-protein ligase RNF180	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q86T96	285671		592	68254
RNF181	E3 ubiquitin-protein ligase RNF181	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9P0P0	51255		153	17909
RNF182	E3 ubiquitin-protein ligase RNF182	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8N6D2	221687		247	27402
RNF183	E3 ubiquitin-protein ligase RNF183	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96D59	138065		192	21617
RNF185	E3 ubiquitin-protein ligase RNF185	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96GF1	91445		192	20459
RNF186	E3 ubiquitin-protein ligase RNF186	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9NXI6	54546		227	24145
RNF208	RING finger protein 208	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9H0X6	727800		261	27964
RNF212	Probable E3 SUMO-protein ligase RNF212	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q495C1	285498		297	33365
RNF212B	RING finger protein 212B	UPS	E3 ligase	RING	other	assorted	IPR017907	(none noted)	A8MTL3	100507650	C14orf164	300	33570
RNF214	RING finger protein 214	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q8ND24	257160		703	77667
RNF215	RING finger protein 215	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9Y6U7	200312		377	41101
RNF220	E3 ubiquitin-protein ligase RNF220	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q5VTB9	55182	C1orf164	566	62765
RNF222	RING finger protein 222	UPS	E3 ligase	RING	other	assorted	IPR001841, IPR027370	(none noted)	A6NCQ9	643904		220	23767
RNF223	RING finger protein 223	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	E7ERA6	401934		249	26629
RNF224	RING finger protein 224	UPS	E3 ligase	RING	other	assorted	IPR001841, IPR027370	(none noted)	P0DH78	643596		156	16549
RNF225	RING finger protein 225	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	M0QZC1	646862		329	34789
RNF227	RING finger protein 227	UPS	E3 ligase	RING	other	assorted	IPR001841, IPR027370	(none noted)	A6NIN4	284023	LINC02581	190	21006
RNFT1	E3 ubiquitin-protein ligase RNFT1	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q5M7Z0	51136		435	49710
RNFT2	RING finger and transmembrane domain-containing protein 2	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q96EX2	84900	TMEM118	444	48965
SYVN1	E3 ubiquitin-protein ligase synoviolin	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q86TM6	84447	HRD1 KIAA1810	617	67685
TOPORS	E3 ubiquitin-protein ligase Topors	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9NS56	10210	LUN TP53BPL	1045	119198
TRAIP	E3 ubiquitin-protein ligase TRAIP	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9BWF2	10293	RNF206 TRIP	469	53294
ZNF598	E3 ubiquitin-protein ligase ZNF598	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q86UK7	90850		904	98637
ZNRF3	E3 ubiquitin-protein ligase ZNRF3	UPS	E3 ligase	RING	other	assorted	IPR001841	(none noted)	Q9ULT6	84133	KIAA1133 RNF203	936	100574
BABAM2	BRISC and BRCA1-A complex member 2	UPS	E3 ligase	RING cofactor	BRCA1-specific		(none noted)	(none noted)	Q9NXR7	9577	BRCC45 BRE	383	43552
TRAF1	TNF receptor-associated factor 1	UPS	E3 ligase	RING cofactor	TRAF2-specific	MATH/TRAF	(none noted)	IPR002083	Q13077	7185	EBI6	416	46164
MAGEA1	Melanoma-associated antigen 1	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43355	4100	MAGE1 MAGE1A	309	34342
MAGEA2	Melanoma-associated antigen 2	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43356	266740	MAGE2 MAGEA2A	314	35055
MAGEA3	Melanoma-associated antigen 3	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43357	4102	MAGE3	314	34747
MAGEA6	Melanoma-associated antigen 6	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43360	4105	MAGE6	314	34891

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
MAGEA4	Melanoma-associated antigen 4	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43358	4103	MAGE4	317	34899
MAGEA12	Melanoma-associated antigen 12	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43365	4111	MAGE12	314	34836
MAGEC2	Melanoma-associated antigen C2	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q9UBF1	51438	HCA587 MAGEE1	373	41163
MAGEB18	Melanoma-associated antigen B18	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q96M61	286514		343	38533
MAGED1	Melanoma-associated antigen D1	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q9Y5V3	9500	NRAGE	778	86161
MAGEF1	Melanoma-associated antigen F1	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q9HAY2	64110		307	35222
NSMCE3	Non-structural maintenance of chromosomes element 3 homolog	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q96MG7	56160	HCA4 MAGEG1 NDNL2	304	34308
MAGEL2	MAGE-like protein 2	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	Q9UJ55	54551	NDNL1	1249	132822
MAGEA11	Melanoma-associated antigen 11	UPS	E3 ligase	RING cofactor	MAGE		IPR002190	(none noted)	P43364	4110	MAGE11	429	48129
		UPS	**E3 ligase**	**assorted**									
UBE2O	(E3-independent) E2 ubiquitin-conjugating enzyme UBE2O	UPS	E3 ligase	assorted	with intrinsic E2		(none noted)	IPR000608	Q9C0C9	63893	KIAA1734	1292	141293
BIRC6	Baculoviral IAP repeat-containing protein 6	UPS	E3 ligase	assorted	with intrinsic E2	BIR repeat	(none noted)	IPR000608, IPR001370	Q9NR09	57448	KIAA1289	4857	530269
TNFAIP3	Tumor necrosis factor alpha-induced protein 3	UPS	E3 ligase	assorted	with OTU	A20	(none noted)	IPR003323, IPR002653	P21580	7128	OTUD7C	790	89614
NEURL4	Neuralized-like protein 4	UPS	E3 ligase	assorted	NHR		(none noted)	IPR006573	Q96JN8	84461	KIAA1787	1562	166907
JADE2	E3 ubiquitin-protein ligase Jade-2	UPS	E3 ligase	assorted	PHD-type ZnF		(none noted)	IPR001965	Q9NQC1	23338	KIAA0239 PHF15	790	87466
UBAC1	Ubiquitin-associated domain-containing protein 1	UPS	E3 ligase	assorted	UBL, UBA		(none noted)	cd17066, IPR015940	Q9BSL1	10422	GBDR1 KPC2 UBADC1	405	45338
E4F1	Transcription factor E4F1	UPS	E3 ligase	assorted			(none noted)	(none noted)	Q66K89	1877	E4F	784	83496
TMEM129	E3 ubiquitin-protein ligase TM129	UPS	E3 ligase	assorted			(none noted)	(none noted)	A0AVI4	92305		362	40464
ZFP91	E3 ubiquitin-protein ligase ZFP91	UPS	E3 ligase	assorted			(none noted)	(none noted)	Q96JP5	80829	ZNF757	570	63445
C10orf90	(E2-independent) E3 ubiquitin-conjugating enzyme FATS	UPS	E3 ligase	assorted			(none noted)	(none noted)	Q96M02	118611	FATS	699	77910
UBE3D	E3 ubiquitin-protein ligase E3D	UPS	E3 ligase	assorted			(none noted)	(none noted)	Q7Z6J8	90025	C6orf157 H10BH UBE2CBP	389	43657
EGR2	E3 SUMO-protein ligase EGR2	UPS	E3 ligase	assorted			(none noted)	(none noted)	P11161	1959	KROX20	476	50302
PPP1R11	E3 ubiquitin-protein ligase PPP1R11	UPS	E3 ligase	assorted			(none noted)	(none noted)	O60927	6992	HCGV TCTE5	126	13953
TRAF3IP2	E3 ubiquitin ligase TRAF3IP2	UPS	E3 ligase	assorted			(none noted)	(none noted)	O43734	10758	C6orf2 C6orf4 C6orf5 C6orf6	574	64666
		UPS	**E3 ligase**	**UBL modifiers**									
HERC5	E3 ISG15--protein ligase HERC5	UPS	E3 ligase	UBL modifiers	ISG15ylation	HECT	IPR000569	IPR009091	Q9UII4	51191	CEB1 CEBP1	1024	116852
HERC6	Probable E3 ubiquitin-protein ligase HERC6	UPS	E3 ligase	UBL modifiers	ISG15ylation	HECT	IPR000569	IPR009091	Q8IVU3	55008		1022	115126
ARIH1	E3 ubiquitin-protein ligase ARIH1	UPS	E3 ligase	UBL modifiers	ISG15ylation	RBR	IPR004181	IPR044066	Q9Y4X5	25820	ARI MOP6 UBCH7BP	557	64118
TRIM25	E3 ubiquitin/ISG15 ligase TRIM25	UPS	E3 ligase	UBL modifiers	ISG15ylation	TRIM (SPRY)	IPR001841, IPR027370	IPR001870, IPR003877	Q14258	7706	EFP RNF147 ZNF147	630	70973
PIAS1	E3 SUMO-protein ligase PIAS1	UPS	E3 ligase	UBL modifiers	sumoylation	MIZ	IPR004181	IPR003034	O75925	8554	DDXBP1	651	71836
PIAS2	E3 SUMO-protein ligase PIAS2	UPS	E3 ligase	UBL modifiers	sumoylation	MIZ	IPR004181	IPR003034	O75928	9063	PIASX	621	68240
PIAS3	E3 SUMO-protein ligase PIAS3	UPS	E3 ligase	UBL modifiers	sumoylation	MIZ	IPR004181	IPR003034	Q9Y6X2	10401		628	68017
PIAS4	E3 SUMO-protein ligase PIAS4	UPS	E3 ligase	UBL modifiers	sumoylation	MIZ	IPR004181	IPR003034	Q8N2W9	51588	PIASG	510	56504
NSMCE2	E3 SUMO-protein ligase NSE2	UPS	E3 ligase	UBL modifiers	sumoylation	MIZ	IPR004181		Q96MF7	286053	C8orf36 MMS21	247	27932
RANBP2	E3 SUMO-protein ligase RanBP2	UPS	E3 ligase	UBL modifiers	sumoylation	non-MIZ	(none noted)	IPR011990, IPR001876, IPR002130	P49792	5903	NUP358	3224	358199
CBX4	E3 SUMO-protein ligase CBX4	UPS	E3 ligase	UBL modifiers	sumoylation	non-MIZ	(none noted)	(none noted)	O00257	8535		560	61368
ZBED1	E3 SUMO-protein ligase ZBED1	UPS	E3 ligase	UBL modifiers	sumoylation	non-MIZ	(none noted)	(none noted)	O96006	9189	ALTE DREF hDREF KIAA0785 TRAMP	694	78156
ZNF451	E3 SUMO-protein ligase ZNF451	UPS	E3 ligase	UBL modifiers	sumoylation	non-MIZ	(none noted)	(none noted)	Q9Y4E5	26036	COASTER KIAA0576 KIAA1702	1061	121484
DCUN1D1	DCN1-like protein 1	UPS	E3 ligase	UBL modifiers	NEDDylation	PONY	IPR005176	(none noted)	Q96GG9	54165	DCN1 DCUN1L1 RP42 SCCRO	259	30124
DCUN1D2	DCN1-like protein 2	UPS	E3 ligase	UBL modifiers	NEDDylation	PONY	IPR005176	(none noted)	Q6PH85	55208	C13orf17 DCUN1L2	259	30179
DCUN1D3	DCN1-like protein 3	UPS	E3 ligase	UBL modifiers	NEDDylation	PONY	IPR005176	(none noted)	Q8IWE4	123879	SCCRO3	304	34291
DCUN1D4	DCN1-like protein 4	UPS	E3 ligase	UBL modifiers	NEDDylation	PONY	IPR005176	(none noted)	Q92564	23142	KIAA0276	292	34068
DCUN1D5	DCN1-like protein 5	UPS	E3 ligase	UBL modifiers	NEDDylation	PONY	IPR005176	(none noted)	Q9BTE7	84259	SCCRO5	237	27508
UFL1	E3 UFM1-protein ligase 1	UPS	E3 ligase	UBL modifiers	UFMylation		(none noted)		O94874	23376	KIAA0776 MAXER NLBP RCAD	794	89595
CDK5RAP3	CDK5 regulatory subunit-associated protein 3	UPS	E3 ligase	UBL modifiers	UFMylation		(none noted)		Q96JB5	80279	IC53 LZAP	506	56921
DDRGK1	DDRGK domain-containing protein 1	UPS	E3 ligase	UBL modifiers	UFMylation adaptor		(none noted)	IPR019153	Q96HY6	65992	C20orf116 UFBP1	314	35611
		UPS	**Ub and UBL demodifiers**										
		UPS	**Ub and UBL demodifiers**	**USP**									
USP7	Ubiquitin carboxyl-terminal hydrolase 7	UPS	Ub and UBL demodifiers	USP	MATH-TRAF, UBL (external)		IPR028889, IPR001394	IPR002083, PMID:17597129	Q93009	7874	HAUSP	1102	128302
USP48	Ubiquitin carboxyl-terminal hydrolase 48	UPS	Ub and UBL demodifiers	USP	DUSP, UBL (external)		IPR028889, IPR001394	IPR035927, IPR006615, IPR044743, IPR000626, PMID:17597129	Q86UV5	84196	USP31	1035	119032
USP11	Ubiquitin carboxyl-terminal hydrolase 11	UPS	Ub and UBL demodifiers	USP	DUSP, UBLs (internal, external)		IPR028889, IPR001394	IPR035927, IPR006615, IPR028135, PMID:17597129	P51784	8237	UHX1	963	109817
USP15	Ubiquitin carboxyl-terminal hydrolase 15	UPS	Ub and UBL demodifiers	USP	DUSP, UBLs (internal, external)		IPR028889, IPR001394	IPR035927, IPR006615, IPR028135, PMID:17597129	Q9Y4E8	9958	KIAA0529	981	112419

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
USP4	Ubiquitin carboxyl-terminal hydrolase 4	UPS	Ub and UBL demodifiers	USP	DUSP, UBLs (internal, external)		IPR028889, IPR001394	IPR035927, IPR006615, IPR028135, PMID:17597129	Q13107	7375	UNP UNPH	963	108565
USP32	Ubiquitin carboxyl-terminal hydrolase 32	UPS	Ub and UBL demodifiers	USP	DUSP, UBLs (internal, external)		IPR028889, IPR001394	IPR035927, IPR006615, PMID:17597129	Q8NFA0	84669	USP10	1604	181656
USP33	Ubiquitin carboxyl-terminal hydrolase 33	UPS	Ub and UBL demodifiers	USP	DUSP, UBP-ZnF		IPR028889, IPR001394	IPR035927, IPR006615, IPR001607	Q8TEY7	23032	KIAA1097 VDU1	942	106727
USP20	Ubiquitin carboxyl-terminal hydrolase 20	UPS	Ub and UBL demodifiers	USP	DUSP, UBP-ZnF		IPR028889, IPR001394	IPR035927, IPR006615, IPR001607	Q9Y2K6	10868	KIAA1003 LSFR3A VDU2	914	102003
USP5	Ubiquitin carboxyl-terminal hydrolase 5	UPS	Ub and UBL demodifiers	USP	UBP-ZnF, UBA		IPR028889, IPR001394	IPR001607, IPR041432, IPR015940, IPR009060	P45974	8078	ISOT	858	95786
USP13	Ubiquitin carboxyl-terminal hydrolase 13	UPS	Ub and UBL demodifiers	USP	UBP-ZnF, UBA		IPR028889, IPR001394	IPR001607, IPR041432, IPR015940, IPR009060	Q92995	8975	ISOT3	863	97327
USP3	Ubiquitin carboxyl-terminal hydrolase 3	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q9Y6I4	9960		520	58897
USP16	Ubiquitin carboxyl-terminal hydrolase 16	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q9Y5T5	10600		823	93570
USP22	Ubiquitin carboxyl-terminal hydrolase 22	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q9UPT9	23326	KIAA1063 USP3L	525	59961
USP39	U4/U6.U5 tri-snRNP-associated protein 2	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q53GS9	10713		565	65381
USP44	Ubiquitin carboxyl-terminal hydrolase 44	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q9H0E7	84101		712	81185
USP45	Ubiquitin carboxyl-terminal hydrolase 45	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q70EL2	85015		814	91733
USP49	Ubiquitin carboxyl-terminal hydrolase 49	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q70CQ1	25862		688	79198
USP51	Ubiquitin carboxyl-terminal hydrolase 51	UPS	Ub and UBL demodifiers	USP	UBP-ZnF		IPR028889, IPR001394	IPR001607	Q70EK9	158880		711	79756
USP28	Ubiquitin carboxyl-terminal hydrolase 28	UPS	Ub and UBL demodifiers	USP	UBA		IPR028889, IPR001394	IPR009060	Q96RU2	57646	KIAA1515	1077	122491
USP25	Ubiquitin carboxyl-terminal hydrolase 25	UPS	Ub and UBL demodifiers	USP	UBA, UIM		IPR028889, IPR001394	IPR003903, IPR009060	Q9UHP3	29761	USP21	1055	122218
USP37	Ubiquitin carboxyl-terminal hydrolase 37	UPS	Ub and UBL demodifiers	USP	PH-like, UIM		IPR028889, IPR001394	IPR003903, IPR032069	Q86T82	57695	KIAA1594	979	110170
USP26	Ubiquitin carboxyl-terminal hydrolase 26	UPS	Ub and UBL demodifiers	USP	PH-like		IPR028889, IPR001394	IPR032069	Q9BXU7	83844		913	104047
USP29	Ubiquitin carboxyl-terminal hydrolase 29	UPS	Ub and UBL demodifiers	USP	PH-like		IPR028889, IPR001394	IPR032069	Q9HBJ7	57663		922	104156
USP35	Ubiquitin carboxyl-terminal hydrolase 35	UPS	Ub and UBL demodifiers	USP	Armadillo-type		IPR028889, IPR001394	IPR016024	Q9P2H5	57558	KIAA1372 USP34	1018	113405
USP9X	Probable ubiquitin carboxyl-terminal hydrolase FAF-X	UPS	Ub and UBL demodifiers	USP	Armadillo-type, UBL (external)		IPR028889, IPR001394	IPR016024, PMID:17597129	Q93008	8239	DFFRX FAM USP9	2554	290463
USP9Y	Probable ubiquitin carboxyl-terminal hydrolase FAF-Y	UPS	Ub and UBL demodifiers	USP	Armadillo-type, UBL (external)		IPR028889, IPR001394	IPR016024, PMID:17597129	O00507	8287	DFFRY	2555	291077
USP34	Ubiquitin carboxyl-terminal hydrolase 34	UPS	Ub and UBL demodifiers	USP	Armadillo-type, UBL (external)		IPR028889, IPR001394	IPR016024, PMID:17597129	Q70CQ2	9736	KIAA0570 KIAA0729	3546	404233
USP24	Ubiquitin carboxyl-terminal hydrolase 24	UPS	Ub and UBL demodifiers	USP	Armadillo-type, UBA, UBL (external)		IPR028889, IPR001394	IPR016024, IPR015940, IPR009060, PMID:17597129	Q9UPU5	23358	KIAA1057	2620	294365
USP6	Ubiquitin carboxyl-terminal hydrolase 6	UPS	Ub and UBL demodifiers	USP	Rab-GTPase-TBC		IPR028889, IPR001394	IPR000195	P35125	9098	HRP1 TRE2	1406	158658
USP8	Ubiquitin carboxyl-terminal hydrolase 8	UPS	Ub and UBL demodifiers	USP	dimerization, rhodanese-like		IPR028889, IPR001394	IPR015063, IPR001763	P40818	9101	KIAA0055 UBPY	1118	127523
USP10	Ubiquitin carboxyl-terminal hydrolase 10	UPS	Ub and UBL demodifiers	USP	Ataxin-2, C term		IPR028889, IPR001394	IPR009818	Q14694	9100	KIAA0190	798	87134
CYLD	Ubiquitin carboxyl-terminal hydrolase CYLD	UPS	Ub and UBL demodifiers	USP	CAP Gly-rich domain		IPR028889, IPR001394	IPR000938	Q9NQC7	1540	CYLD1 KIAA0849	956	107316
USP14	Ubiquitin carboxyl-terminal hydrolase 14	UPS	Ub and UBL demodifiers	USP	UBL (external)		IPR028889, IPR001394	IPR000626, PMID:17597129	P54578	9097	TGT	494	56069
USP47	Ubiquitin carboxyl-terminal hydrolase 47	UPS	Ub and UBL demodifiers	USP	UBL (external)		IPR028889, IPR001394	PMID:17597129	Q96K76	55031		1375	157311
USP40	Ubiquitin carboxyl-terminal hydrolase 40	UPS	Ub and UBL demodifiers	USP	UBL (external)		IPR028889, IPR001394	PMID:17597129	Q9NVE5	55230		1235	140130
USP19	Ubiquitin carboxyl-terminal hydrolase 19	UPS	Ub and UBL demodifiers	USP	UBL (internal)		IPR028889, IPR001394	PMID:17597129	O94966	10869	KIAA0891 ZMYND9	1318	145651
USP31	Ubiquitin carboxyl-terminal hydrolase 31	UPS	Ub and UBL demodifiers	USP	UBL (internal)		IPR028889, IPR001394	PMID:17597129	Q70CQ4	57478	KIAA1203	1352	146651
USP43	Ubiquitin carboxyl-terminal hydrolase 43	UPS	Ub and UBL demodifiers	USP	UBL (internal)		IPR028889, IPR001394	PMID:17597129	Q70EL4	124739		1123	122809
USP36	Ubiquitin carboxyl-terminal hydrolase 36	UPS	Ub and UBL demodifiers	USP	assorted, large		IPR028889, IPR001394	(none noted)	Q9P275	57602	KIAA1453	1123	122908
USP38	Ubiquitin carboxyl-terminal hydrolase 38	UPS	Ub and UBL demodifiers	USP	assorted, large		IPR028889, IPR001394	(none noted)	Q8NB14	84640	KIAA1891	1042	116546
USP42	Ubiquitin carboxyl-terminal hydrolase 42	UPS	Ub and UBL demodifiers	USP	assorted, large		IPR028889, IPR001394	(none noted)	Q9H9J4	84132		1324	145392
USP53	Inactive ubiquitin carboxyl-terminal hydrolase 53	UPS	Ub and UBL demodifiers	USP	assorted, large		IPR028889, IPR001394	(none noted)	Q70EK8	54532	KIAA1350	1073	120806
USP54	Inactive ubiquitin carboxyl-terminal hydrolase 54	UPS	Ub and UBL demodifiers	USP	assorted, large		IPR028889, IPR001394	(none noted)	Q70EL1	159195	C10orf29	1684	187388
USP1	Ubiquitin carboxyl-terminal hydrolase 1	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	O94782	7398		785	88207
USP2	Ubiquitin carboxyl-terminal hydrolase 2	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	O75604	9099	UBP41	605	68072
USP12	Ubiquitin carboxyl-terminal hydrolase 12	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	O75317	219333	UBH1 USP12L1	370	42858
USP18	Ubl carboxyl-terminal hydrolase 18	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q9UMW8	11274	ISG43	372	43011
USP17L2	Ubiquitin carboxyl-terminal hydrolase 17	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q6R6M4	377630	DUB3 USP17 USP17H USP17I USP17J USP17K USP17L USP17M	530	59619
USP21	Ubiquitin carboxyl-terminal hydrolase 21	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q9UK80	27005	USP23	565	62656
USP41	Putative ubiquitin carboxyl-terminal hydrolase 41	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q3LFD5	373856		358	41394
USP27X	Ubiquitin carboxyl-terminal hydrolase 27	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	A6NNY8	389856	USP22L USP27	438	49630
USP30	Ubiquitin carboxyl-terminal hydrolase 30	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q70CQ3	84749		517	58503
USP46	Ubiquitin carboxyl-terminal hydrolase 46	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	P62068	64854		366	42442
USP50	Inactive ubiquitin carboxyl-terminal hydrolase 50	UPS	Ub and UBL demodifiers	USP	assorted		IPR028889, IPR001394	(none noted)	Q70EL3	373509		339	38955
USPL1	SUMO-specific isopeptidase USPL1	UPS	Ub and UBL demodifiers	USP	deSUMOylation		IPR028889, IPR028890	(none noted)	Q5W0Q7	10208	C13orf22 D13S106	1092	120440
		UPS	**Ub and UBL demodifiers**	**UCH**									

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
UCHL5	Ubiquitin carboxyl-terminal hydrolase isozyme L5	UPS	Ub and UBL demodifiers	UCH			IPR001578	(none noted)	Q9Y5K5	51377	UCH37	329	37607
UCHL3	Ubiquitin carboxyl-terminal hydrolase isozyme L3	UPS	Ub and UBL demodifiers	UCH			IPR001578	(none noted)	P15374	7347		230	26183
BAP1	Ubiquitin carboxyl-terminal hydrolase BAP1	UPS	Ub and UBL demodifiers	UCH			IPR001578	(none noted)	Q92560	8314	KIAA0272	729	80362
UCHL1	Ubiquitin carboxyl-terminal hydrolase isozyme L1	UPS	Ub and UBL demodifiers	UCH			IPR001578	(none noted)	P09936	7345		223	24824
		UPS	**Ub and UBL demodifiers**	**JAMM / MPN**									
PSMD14	26S proteasome non-ATPase regulatory subunit 14	UPS	Ub and UBL demodifiers	JAMM / MPN	proteasome		IPR037518	(none noted)	O00487	10213	POH1	310	34577
COPS5	COP9 signalosome complex subunit 5	UPS	Ub and UBL demodifiers	JAMM / MPN	CSN complex		IPR037518	(none noted)	Q92905	10987	CSN5 JAB1	334	37579
BRCC3	Lys-63-specific deubiquitinase BRCC36	UPS	Ub and UBL demodifiers	JAMM / MPN	assorted		IPR037518	(none noted)	P46736	79184	BRCC36 C6.1A CXorf53	316	36072
STAMBP	STAM-binding protein	UPS	Ub and UBL demodifiers	JAMM / MPN	assorted		IPR037518	(none noted)	O95630	10617	AMSH	424	48077
STAMBPL1	AMSH-like protease	UPS	Ub and UBL demodifiers	JAMM / MPN	assorted		IPR037518	(none noted)	Q96FJ0	57559	AMSHLP KIAA1373	436	49783
MPND	MPN domain-containing protein	UPS	Ub and UBL demodifiers	JAMM / MPN	assorted		IPR037518	(none noted)	Q8N594	84954		471	50662
MYSM1	Deubiquitinase MYSM1	UPS	Ub and UBL demodifiers	JAMM / MPN	assorted		IPR037518	(none noted)	Q5VVJ2	114803	KIAA1915	828	95032
		UPS	**Ub and UBL demodifiers**	**OTU**									
OTUD7A	OTU domain-containing protein 7A	UPS	Ub and UBL demodifiers	OTU	A20		IPR003323	IPR002653	Q8TE49	161725	C15orf16 CEZANNE2 OTUD7	926	100677
OTUD7B	OTU domain-containing protein 7B	UPS	Ub and UBL demodifiers	OTU	A20		IPR003323	IPR002653	Q6GQQ9	56957	ZA20D1	843	92526
TNFAIP3	Tumor necrosis factor alpha-induced protein 3	UPS	Ub and UBL demodifiers	OTU	A20		IPR003323	IPR002653	P21580	7128	OTUD7C	790	89614
YOD1	Ubiquitin thioesterase OTU1	UPS	Ub and UBL demodifiers	OTU	UBL		IPR003323	cd17059	Q5VVQ6	55432	DUBA8 HIN7 OTUD2	348	38322
VCPIP1	Deubiquitinating protein VCPIP1	UPS	Ub and UBL demodifiers	OTU	UBL		IPR003323	cd17059	Q96JH7	80124	KIAA1850 VCIP135	1222	134321
ZRANB1	Ubiquitin thioesterase ZRANB1	UPS	Ub and UBL demodifiers	OTU	RanBP2-type ZnF		IPR003323	IPR036443	Q9UGI0	54764	TRABID	708	80967
ALG13	Putative bifunctional UDP-N-acetylglucosamine transferase and deubiquitinase ALG13	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q9NP73	79868	CXorf45 GLT28D1	1137	126056
OTUB1	Ubiquitin thioesterase OTUB1	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q96FW1	55611	OTB1 OTU1	271	31284
OTUB2	Ubiquitin thioesterase OTUB2	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q96DC9	78990	C14orf137 OTB2 OTU2	234	27213
OTUD1	OTU domain-containing protein 1	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q5VV17	220213	DUBA7 OTDC1	481	51063
OTUD3	OTU domain-containing protein 3	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q5T2D3	23252	KIAA0459	398	45124
OTUD4	OTU domain-containing protein 4	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q01804	54726	HIN-1 KIAA1046	1114	124045
OTUD5	OTU domain-containing protein 5	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q96G74	55593		571	60626
OTUD6A	OTU domain-containing protein 6A	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q7L8S5	139562	DUBA2	288	33300
OTUD6B	Deubiquitinase OTUD6B	UPS	Ub and UBL demodifiers	OTU	assorted		IPR003323	(none noted)	Q8N6M0	51633	DUBA5	293	33813
OTULIN	Ubiquitin thioesterase otulin	UPS	Ub and UBL demodifiers	OTU	assorted		IPR023237	(none noted)	Q96BN8	90268	FAM105B	352	40263
		UPS	**Ub and UBL demodifiers**	**MINDY**									
MINDY1	Ubiquitin carboxyl-terminal hydrolase MINDY-1	UPS	Ub and UBL demodifiers	MINDY			IPR033979	(none noted)	Q8N5J2	55793	FAM63A KIAA1390	469	51778
MINDY2	Ubiquitin carboxyl-terminal hydrolase MINDY-2	UPS	Ub and UBL demodifiers	MINDY			IPR033979	(none noted)	Q8NBR6	54629	FAM63B KIAA1164	621	67106
MINDY3	Ubiquitin carboxyl-terminal hydrolase MINDY-3	UPS	Ub and UBL demodifiers	MINDY			IPR025257	(none noted)	Q9H8M7	80013	C10orf97 CARP DERP5 FAM188A	445	49725
MINDY4	Probable ubiquitin carboxyl-terminal hydrolase MINDY-4	UPS	Ub and UBL demodifiers	MINDY			IPR025257	(none noted)	Q4G0A6	84182	C7orf67 FAM188B	757	84372
		UPS	**Ub and UBL demodifiers**	**Josephin**									
ATXN3	Ataxin-3	UPS	Ub and UBL demodifiers	Josephin	UIM		IPR006155	IPR003903	P54252	4287	ATX3 MJD MJD1 SCA3	361	41250
ATXN3L	Ataxin-3-like protein	UPS	Ub and UBL demodifiers	Josephin	UIM		IPR006155	IPR003903	Q9H3M9	92552	ATX3L MJDL	355	40747
JOSD1	Josephin-1	UPS	Ub and UBL demodifiers	Josephin	non-UIM		IPR006155	(none noted)	Q15040	9929	JSPH1 KIAA0063	202	23198
JOSD2	Josephin-2	UPS	Ub and UBL demodifiers	Josephin	non-UIM		IPR006155	(none noted)	Q8TAC2	126119		188	20756
		UPS	**Ub and UBL demodifiers**	**UFSP**									
ZUP1	Zinc finger-containing ubiquitin peptidase 1	UPS	Ub and UBL demodifiers	UFSP	DUB		IPR012462	(none noted)	Q96AP4	221302	C6orf113 ZUFSP	578	65959
UFSP2	Ufm1-specific protease 2	UPS	Ub and UBL demodifiers	UFSP	deURMylase		IPR012462	(none noted)	Q9NUQ7	55325	C4orf20	469	53261
UFSP1	Inactive Ufm1-specific protease 1	UPS	Ub and UBL demodifiers	UFSP	inactive deURMylase		IPR012462	(none noted)	Q6NVU6	402682		142	15060
		UPS	**Ub and UBL demodifiers**	**SENP**									
SENP1	Sentrin-specific protease 1	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q9P0U3	29843		644	73481
SENP2	Sentrin-specific protease 2	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q9HC62	59343	KIAA1331	589	67855
SENP3	Sentrin-specific protease 3	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q9H4L4	26168	SSP3 SUSP3	574	65010
SENP5	Sentrin-specific protease 5	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q96HI0	205564		755	86693
SENP6	Sentrin-specific protease 6	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q9GZR1	26054	KIAA0797 SSP1 SUSP1	1112	126146
SENP7	Sentrin-specific protease 7	UPS	Ub and UBL demodifiers	SENP	deSUMOylase		IPR003653	(none noted)	Q9BQF6	57337	KIAA1707 SSP2 SUSP2	1050	119658
SENP8	Sentrin-specific protease 8	UPS	Ub and UBL demodifiers	SENP	deNEDDylase, NEDD8 processing		IPR003653	(none noted)	Q96LD8	123228	DEN1 NEDP1 PRSC2	212	24107
		UPS	**Ub and UBL demodifiers**	**Signalosome**									

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
COPS5	COP9 signalosome complex subunit 5	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase	MPN, active subunit	IPR037518	(none noted)	Q92905	10987	CSN5 JAB1	334	37579
COPS6	COP9 signalosome complex subunit 6	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase	MPN, inactive	(none noted)	IPR037518	Q7L5N1	10980	CSN6 HVIP	327	36163
COPS2	COP9 signalosome complex subunit 2	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	P61201	9318	CSN2 TRIP15	443	51597
COPS3	COP9 signalosome complex subunit 3	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q9UNS2	8533	CSN3	423	47873
COPS4	COP9 signalosome complex subunit 4	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q9BT78	51138	CSN4	406	46269
COPS7A	COP9 signalosome complex subunit 7a	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q9UBW8	50813	CSN7A DERP10	275	30277
COPS7B	COP9 signalosome complex subunit 7b	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q9H9Q2	64708	CSN7B	264	29622
COPS8	COP9 signalosome complex subunit 8	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q99627	10920	CSN8	209	23226
GPS1	COP9 signalosome complex subunit 1	UPS	Ub and UBL demodifiers	CSN complex	deNEDDylase		(none noted)	IPR000717	Q13098	2873	COPS1 CSN1	491	55537
		UPS	ubiquitin and UBL binding										
		UPS	ubiquitin and UBL binding	proteasomal subunits									
PSMD4	26S proteasome non-ATPase regulatory subunit 4	UPS	ubiquitin and UBL binding	proteasomal subunits	regulatory particle	UIM	IPR003903	IPR002035	P55036	5710	MCB1	377	40737
PSMD4	26S proteasome non-ATPase regulatory subunit 4	UPS	ubiquitin and UBL binding	proteasomal subunits	regulatory particle	idiosyncratic Ub binding / VWA	PMID: 27698474 (by analogy with Sc RPN10)	IPR002035	P55036	5710	MCB1	377	40737
ADRM1	Proteasomal ubiquitin receptor ADRM1	UPS	ubiquitin and UBL binding	proteasomal subunits	regulatory particle	idiosyncratic Ub binding / PRU	PMID: 18497817, PMID: 18497827 (by analogy with Sc RPN13)	IPR044868	Q16186	11047	GP110	407	42153
PSMD2	26S proteasome non-ATPase regulatory subunit 2	UPS	ubiquitin and UBL binding	proteasomal subunits	regulatory particle	idiosyncratic Ub binding / Armadillo	PMID: 26912900 (by analogy with Sc RPN1)	IPR011989	Q13200	5708	TRAP2	908	100200
		UPS	ubiquitin and UBL binding	other proteases									
CAPN15	Calpain-15	UPS	ubiquitin and UBL binding	other proteases	endopeptidase	RanBP2-type ZnF	IPR001876, IPR036443	IPR001300	O75808	6650	SOLH	1086	117314
RHBDD1	Rhomboid-related protein 4	UPS	ubiquitin and UBL binding	other proteases	serine protease	UIM	PMID: 27264103 (UIM)	IPR022764	Q8TEB9	84236	RHBDL4	315	35823
SPRTN	DNA-dependent metalloprotease SPRTN	UPS	ubiquitin and UBL binding	other proteases	endopeptidase	UBZ	IPR006642	IPR006640	Q9H040	83932	C1orf124 DVC1	489	55134
		UPS	ubiquitin and UBL binding	p97-associated cofactor									
PLAA	Phospholipase A-2-activating protein	UPS	ubiquitin and UBL binding	p97-associated cofactor	PFUC		IPR015155, IPR038122	IPR013535	Q9Y263	9373	PLAP	795	87157
		UPS	ubiquitin and UBL binding	with UBL									
DDI2	Protein DDI1 homolog 2	UPS	ubiquitin and UBL binding	with UBL	protease	UIM	PMID: 27461074 (UIM)	IPR000626, IPR019103	Q5TDH0	84301		399	44523
RAD23A	UV excision repair protein RAD23 homolog A	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060, IPR041811	IPR000626, IPR006636	P54725	5886		363	39609
RAD23B	UV excision repair protein RAD23 homolog B	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060, IPR041811	IPR000626, IPR006636	P54727	5887		409	43171
UBQLN1	Ubiquilin-1	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060	IPR000626, IPR006636	Q9UMX0	29979	DA41 PLIC1	589	62519
UBQLN2	Ubiquilin-2	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060	IPR000626, IPR006636	Q9UHD9	29978	N4BP4 PLIC2	624	65696
UBQLN3	Ubiquilin-3	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060	IPR000626, IPR006636	Q9H347	50613		655	70841
UBQLN4	Ubiquilin-4	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060	IPR000626, IPR006636	Q9NRR5	56893	C1orf6 CIP75 UBIN	601	63853
UBAC1	Ubiquitin-associated domain-containing protein 1	UPS	ubiquitin and UBL binding	with UBL	with STI1	UBA	IPR015940, IPR009060, IPR041926, IPR041927	cd17066, IPR006636	Q9BSL1	10422	GBDR1 KPC2 UBADC1	405	45338
UBL7	Ubiquitin-like protein 7	UPS	ubiquitin and UBL binding	with UBL	lacking STI1	UBA	IPR015940, IPR009060	IPR000626	Q96S82	84993	BMSCUBP	380	40510
NUB1	NEDD8 ultimate buster 1	UPS	ubiquitin and UBL binding	with UBL	lacking STI1	UBA	IPR015940, IPR009060	IPR041207	Q9Y5A7	51667	NYREN18	615	70538
TINCR	Ubiquitin domain-containing protein TINCR	UPS	ubiquitin and UBL binding	with UBL	lacking STI1	SIM	PMID: 36369429 (SIM)		A0A2R8Y7D0	257000	LINC00036 NCRNA00036 PLAC2	120	13788
		UPS	ubiquitin and UBL binding	with UBX									
FAF1	FAS-associated factor 1	UPS	ubiquitin and UBL binding	with UBX	UBA, SIM		IPR044541, PMID: 30935967 (SIM)	IPR001012	Q9UNN5	11124	UBXD12 UBXN3A	650	73954
FAF2	FAS-associated factor 2	UPS	ubiquitin and UBL binding	with UBX	UBA		IPR009060	IPR001012	Q96CS3	23197	ETEA KIAA0887 UBXD8 UBXN3B	445	52623
NSFL1C	NSFL1 cofactor p47	UPS	ubiquitin and UBL binding	with UBX	UBA		IPR009060	IPR001012	Q9UNZ2	55968	UBXN2C	370	40573
UBXN7	UBX domain-containing protein 7	UPS	ubiquitin and UBL binding	with UBX	UBA, UIM		IPR009060, PMID: 22537386 (UIM)	IPR001012	O94888	26043	KIAA0794 UBXD7	489	54862
UBXN1	UBX domain-containing protein 1	UPS	ubiquitin and UBL binding	with UBX	UBA		IPR015940, IPR009060, IPR041923	IPR001012	Q04323	51035	SAKS1	297	33325
		UPS	ubiquitin and UBL binding	with AN1									
ZFAND2A	AN1-type zinc finger protein 2A	UPS	ubiquitin and UBL binding	with AN1	UBZ		UBZ @ 48-88 (unpublished)	IPR000058	Q8N6M9	90637		145	16477
ZFAND2B	AN1-type zinc finger protein 2B	UPS	ubiquitin and UBL binding	with AN1	UIM, UBZ		IPR003903, UBZ @ 48-88 (unpublished)	IPR000058	Q8WV99	130617	AIRAPL	257	28023
ZFAND3	AN1-type zinc finger protein 3	UPS	ubiquitin and UBL binding	with AN1	A20		IPR002653	IPR000058	Q9H8U3	60685	TEX27	227	25184
ZFAND5	AN1-type zinc finger protein 5	UPS	ubiquitin and UBL binding	with AN1	A20		IPR002653	IPR000058	O76080	7763	ZA20D2 ZNF216	213	23132
ZFAND6	AN1-type zinc finger protein 6	UPS	ubiquitin and UBL binding	with AN1	A20		IPR002653	IPR000058	Q6FIF0	54469	AWP1 ZA20D3	208	22555
		UPS	ubiquitin and UBL binding	protein quality control									
AUP1	Lipid droplet-regulating VLDL assembly factor AUP1	UPS	ubiquitin and UBL binding	protein quality control	ERAD cofactor	UBA	IPR003892	(none noted)	Q9Y679	550		410	45787
UFD1	Ubiquitin recognition factor in ER-associated degradation protein 1	UPS	ubiquitin and UBL binding	protein quality control	ERAD cofactor	idiosyncratic / UT3	PMID: 16004872		Q92890	7353	UFD1L	307	34500
DNAJB2	DnaJ homolog subfamily B member 2	UPS	ubiquitin and UBL binding	protein quality control	HSP70 cochaperone	UIM	IPR003903	IPR001623	P25686	3300	HSJ1 HSPF3	324	35580

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DAXX	Death domain-associated protein 6	UPS	ubiquitin and UBL binding	protein quality control	protein folding & quality control	SIM	PMID: 19106612 (SIM)	IPR046378, IPR031333	Q9UER7	1616	BING2 DAP6	740	81373
		UPS	**ubiquitin and UBL binding**	**E2 conjugating enzymes**									
UBE2K	Ubiquitin-conjugating enzyme E2 K	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	UBA		IPR015940, IPR009060, IPR042599	IPR000608	P61086	3093	HIP2 LIG	200	22407
UBE2Q1	Ubiquitin-conjugating enzyme E2 Q1	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	RWD		by analogy with Hs UBE2Q2		Q7Z7E8	55585	NICE5 UBE2Q	422	46127
UBE2Q2	Ubiquitin-conjugating enzyme E2 Q2	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	RWD		https://doi.org/10.1560/5BRA-FGYK-TU1Q-0XA8		Q8WVN8	92912		375	42818
UBE2A	Ubiquitin-conjugating enzyme E2 A	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		by analogy with Hs UBE2B	IPR000608	P49459	7319	RAD6A	152	17315
UBE2B	Ubiquitin-conjugating enzyme E2 B	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 10388568	IPR000608	P63146	7320	RAD6B	152	17312
UBE2D1	Ubiquitin-conjugating enzyme E2 D1	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 21396940	IPR000608	P51668	7321	SFT UBC5A UBCH5 UBCH5A	147	16602
UBE2D2	Ubiquitin-conjugating enzyme E2 D2	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		by analogy with Hs UBE2D1, Hs UBE2D3	IPR000608	P62837	7322	PUBC1 UBC4 UBC5B UBCH4 UBCH5B	147	16735
UBE2D3	Ubiquitin-conjugating enzyme E2 D3	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 16543155	IPR000608	P61077	7323	UBC5C UBCH5C	147	16687
UBE2D4	Ubiquitin-conjugating enzyme E2 D4	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		by analogy with Hs UBE2D1, Hs UBE2D3	IPR000608	Q9Y2X8	51619	UBCH5D	147	16649
UBE2E3	Ubiquitin-conjugating enzyme E2 E3	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 24901938	IPR000608	Q969T4	10477	UBCE4 UBCH9	207	22913
UBE2G1	Ubiquitin-conjugating enzyme E2 G1	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 31634471	IPR000608	P62253	7326	UBE2G	170	19509
UBE2G2	Ubiquitin-conjugating enzyme E2 G2	UPS	ubiquitin and UBL binding	E2 conjugating enzyme	backside Ub binding		PMID: 21098018	IPR000608	P60604	7327	UBC7	165	18566
UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	UPS	ubiquitin and UBL binding	E2 conjugating enzyme, inactive	UEV, backside Ub binding		IPR016135, IPR000608, by analogy with Hs UBE2V2	IPR000608	Q13404	3875227335	CROC1 UBE2V UEV1	147	16495
UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	UPS	ubiquitin and UBL binding	E2 conjugating enzyme, inactive	UEV, backside Ub binding		IPR016135, IPR000608, PMID: 16518696	IPR000608	Q15819	7336	MMS2 UEV2	145	16363
UBE2I	SUMO-conjugating enzyme UBC9	UPS	ubiquitin and UBL binding	E2 conjugating enzyme / SUMO	backside SUMO binding		PMID: 17491593	IPR000608	P63279	7329	UBC9 UBCE9	158	18007
		UPS	**ubiquitin and UBL binding**	**E3 ligase**									
ANAPC2	Anaphase-promoting complex subunit 2	UPS	ubiquitin and UBL binding	E3 ligase	APC	idiosyncratic Ub binding	PMID: 27259151, PMID: 31350353	(none noted)	Q9UJX6	29882	APC2 KIAA1406	822	93828
ANAPC11	Anaphase-promoting complex subunit 10	UPS	ubiquitin and UBL binding	E3 ligase	APC	idiosyncratic Ub binding	PMID: 27259151, PMID: 31350353	(none noted)	Q9NYG5	10393	APC10	84	9841
HERC2	E3 ubiquitin-protein ligase HERC2	UPS	ubiquitin and UBL binding	E3 ligase	HECT	UBA, SIM	cd14402, PMID: 22508508 (SIM)	IPR000569	O95714	8924		4834	527228
HUWE1	E3 ubiquitin-protein ligase HUWE1	UPS	ubiquitin and UBL binding	E3 ligase	HECT	UBA, UIM, UBM	IPR015940, IPR009060, IPR041918, PMID: 34314700 (UIM, UBM)	IPR000569	Q7Z6Z7	10075	KIAA0312 KIAA1578 UREB1	4374	481891
UBR5	E3 ubiquitin-protein ligase UBR5	UPS	ubiquitin and UBL binding	E3 ligase	HECT & UBR	UBA	cd14423	IPR000569, IPR003126	O95071	51366	EDD EDD1 HYD KIAA0896	2799	309352
ARIH2	E3 ubiquitin-protein ligase ARIH2	UPS	ubiquitin and UBL binding	E3 ligase	RBR	UBA	PMID: 34518685 (UBA)	IPR044066	O95376	10425	ARI2 TRIAD1	493	57819
ARIH1	E3 ubiquitin-protein ligase ARIH1	UPS	ubiquitin and UBL binding	E3 ligase	RBR	UBA	UBA: by analogy with Hs ARIH2	IPR044066	Q9Y4X5	25820	ARI MOP6 UBCH7BP	557	64118
ANKIB1	Ankyrin repeat and IBR domain-containing protein 1	UPS	ubiquitin and UBL binding	E3 ligase	RBR	UIM & UBA	IPR003903, UBA: by analogy with Hs ARIH2	IPR044066	Q9P2G1	54467	KIAA1386	1089	122002
RNF14	E3 ubiquitin-protein ligase RNF14	UPS	ubiquitin and UBL binding	E3 ligase	RBR	RWD domain	IPR016135, IPR006575	IPR044066	Q9UBS8	9604	ARA54	474	53837
RNF31	E3 ubiquitin-protein ligase RNF31	UPS	ubiquitin and UBL binding	E3 ligase	RBR	UBA & RanBP2-type ZnF	IPR015940, IPR032065, IPR001876, IPR036443	IPR044066	Q96EP0	55072	ZIBRA	1072	119652
RNF216	E3 ubiquitin-protein ligase RNF216	UPS	ubiquitin and UBL binding	E3 ligase	RBR	SIM	PMID: 31087003 (SIM)	IPR044066	Q9NWF9	54476	TRIAD3 UBCE7IP1 ZIN	866	99406
CUL9	Cullin-9	UPS	ubiquitin and UBL binding	E3 ligase	RBR & CULLIN	UBA	UBA: by analogy with Hs ARIH2	IPR016158, IPR044066	Q8IWT3	23113	H7AP1 KIAA0708 PARC	2517	281229
AMFR	E3 ubiquitin-protein ligase AMFR	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR003892	IPR001841	Q9UKV5	267	RNF45	643	72996
BIRC2	Baculoviral IAP repeat-containing protein 2	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR041933	IPR001841	Q13490	329	API1 MIHB RNF48	618	69900
BIRC3	Baculoviral IAP repeat-containing protein 3	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	UBA: by analogy with Hs BIRC2	IPR001841	Q13489	330	API2 MIHC RNF49	604	68372
BIRC8	Baculoviral IAP repeat-containing protein 8	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR042579	IPR001841	Q96P09	112401	ILP2	236	27089
CBL	E3 ubiquitin-protein ligase CBL	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR015940, IPR009060	IPR001841	P22681	867	CBL2 RNF55	906	99633
CBLB	E3 ubiquitin-protein ligase CBL-B	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR015940	IPR001841	Q13191	868	RNF56	982	109450
DZIP3	E3 ubiquitin-protein ligase DZIP3	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	UBA @ 1022-1085 (unpublished)	IPR001841	Q86Y13	9666	KIAA0675	1208	138604
RNF214	RING finger protein 214	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	UBA @ 543-605 (unpublished)	IPR001841	Q8ND24	257160		703	77667
TTC3	E3 ubiquitin-protein ligase TTC3	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	UBA @ 1832-1895 (unpublished)	IPR001841	P53804	7267	DCRR1 RNF105 TPRD	2025	229869
XIAP	E3 ubiquitin-protein ligase XIAP	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBA	IPR042579	IPR001841	P98170	331	API3 BIRC4 IAP3	497	56685
MNAT1	CDK-activating kinase assembly factor MAT1	UPS	ubiquitin and UBL binding	E3 ligase	RING	UIM	IPR003903	IPR001841	P51948	4331	CAP35 MAT1 RNF66	309	35823
RNF114	E3 ubiquitin-protein ligase RNF114	UPS	ubiquitin and UBL binding	E3 ligase	RING	UIM	PMID: 17990982 (UIM)	IPR001841	Q9Y508	55905	ZNF228 ZNF313	228	25694
RNF125	E3 ubiquitin-protein ligase RNF125	UPS	ubiquitin and UBL binding	E3 ligase	RING	UIM	PMID: 17990982 (UIM)	IPR001841	Q96EQ8	54941		232	26454
RNF138	E3 ubiquitin-protein ligase RNF138	UPS	ubiquitin and UBL binding	E3 ligase	RING	UIM	PMID: 17990982 (UIM)	IPR001841	Q8WVD3	51444	NARF	245	28193
RNF166	E3 ubiquitin-protein ligase RNF166	UPS	ubiquitin and UBL binding	E3 ligase	RING	UIM	PMID: 17990982 (UIM)	IPR001841	Q96A37	115992		237	26122
RNF168	E3 ubiquitin-protein ligase RNF168	UPS	ubiquitin and UBL binding	E3 ligase	RING	MIU	PMID: 16499958 (MIU)	IPR001841	Q8IYW5	165918		571	65020
RNF169	E3 ubiquitin-protein ligase RNF169	UPS	ubiquitin and UBL binding	E3 ligase	RING	MIU	MIU: by analogy with Hs RNF168	IPR001841	Q8NCN4	254225	KIAA1991	708	77194
RAD18	E3 ubiquitin-protein ligase RAD18	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBZ	IPR006642	IPR001841	Q9NS91	56852	RNF73	495	56223
RNF220	E3 ubiquitin-protein ligase RNF220	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBZ	UBZ @ 215-246 (unpublished)	IPR001841	Q5VTB9	55182	C1orf164	566	62765
ZNRF1	E3 ubiquitin-protein ligase ZNRF1	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBZ	UBZ @ 142-169 (unpublished)	IPR001841	Q8ND25	84937	NIN283	227	23783
ZNRF2	E3 ubiquitin-protein ligase ZNRF2	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBZ	UBZ @ 157-184 (unpublished)	IPR001841	Q8NHG8	223082	RNF202	242	24115
BRAP	BRCA1-associated protein	UPS	ubiquitin and UBL binding	E3 ligase	RING	UBP-associated ZnF	IPR001607	IPR001841, IPR035979	Q7Z569	8315	RNF52	592	67305
MDM2	E3 ubiquitin-protein ligase Mdm2	UPS	ubiquitin and UBL binding	E3 ligase	RING	RanBP2-type ZnF	IPR001876, IPR036443	IPR001841	Q00987	4193		491	55233
MDM4	Protein Mdm4	UPS	ubiquitin and UBL binding	E3 ligase	RING	RanBP2-type ZnF	IPR001876, IPR036443	IPR001841	O15151	4194	MDMX	490	54864
RBCK1	RanBP-type and C3HC4-type zinc finger-containing protein 1	UPS	ubiquitin and UBL binding	E3 ligase	RING	RanBP2-type ZnF	IPR001876, IPR036443	IPR001841	Q9BYM8	10616	C20orf18 RNF54 UBCE7IP3 XAP3 XAP4	510	57572
FANCL	E3 ubiquitin-protein ligase FANCL	UPS	ubiquitin and UBL binding	E3 ligase	RING	RWD domain	IPR016135, IPR043898	IPR026850	Q9NW38	55120	PHF9	375	42905

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LTN1	E3 ubiquitin-protein ligase listerin	UPS	ubiquitin and UBL binding	E3 ligase	RING	RWD domain	RWD domain @ 1631-1709 (unpublished)	IPR001841	O94822	26046	C21orf10 C21orf98 KIAA0714 RNF160 ZNF294	1766	200552
RNF25	E3 ubiquitin-protein ligase RNF25	UPS	ubiquitin and UBL binding	E3 ligase	RING	RWD domain	IPR016135, IPR006575	IPR001841	Q96BH1	64320		459	51219
UBE4B	Ubiquitin conjugation factor E4 B	UPS	ubiquitin and UBL binding	E3 ligase	RING	idiosyncratic UB binding	by analogy with Sc UFD2 (PMID: 10089879)	IPR003613	O95155	10277	HDNB1 KIAA0684 UFD2	1302	146185
PML	Protein PML	UPS	ubiquitin and UBL binding	E3 ligase	RING	SIM	PMID: 28851805 (SIM)	IPR001841	P29590	5371	MYL PP8675 RNF71 TRIM19	882	97551
RNF4	E3 ubiquitin-protein ligase RNF4	UPS	ubiquitin and UBL binding	E3 ligase	RING	SIM	PMID: 18408734 (SIM)	IPR001841	P78317	6047	SNURF	190	21319
RNF111	E3 ubiquitin-protein ligase Arkadia	UPS	ubiquitin and UBL binding	E3 ligase	RING	SIM	PMID: 24912682 (SIM)	IPR001841	Q6ZNA4	54778		994	108862
TRIM5	Tripartite motif-containing protein 5	UPS	ubiquitin and UBL binding	E3 ligase	RING	SIM	PMID: 21490953 (SIM)	IPR001841, IPR003877, IPR000315	Q9C035	85363	RNF88	493	56338
KCMF1	E3 ubiquitin-protein ligase KCMF1	UPS	ubiquitin and UBL binding	E3 ligase	idiosyncratic E3 ligase	UBZ	UBZ @ 77-104, 107-137 (unpublished)	(none noted)	Q9P0J7	56888	FIGC ZZZ1	381	41945
UBE2O	[E2-independent] E2 ubiquitin-conjugating enzyme	UPS	ubiquitin and UBL binding	E3 ligase	idiosyncratic E3 ligase	idiosyncratic UB binding	PMID: 35915257	(none noted)	Q9C0C9	63893	KIAA1734	1292	141293
SHARPIN	Sharpin	UPS	ubiquitin and UBL binding	E3 ligase component	with UBL	RanBP2-type ZnF	IPR001876, IPR036443	cd01799	Q9H0F6	81858	SIPL1	387	39949
UIMC1	BRCA1-A complex subunit RAP80	UPS	ubiquitin and UBL binding	E3 ligase cofactor	RAP80 NTD	UIM, UBZ, SIM	IPR003903, IPR006642, PMID: 26719330 (SIM)	IPR040714 (UIM overlap)	Q96RL1	51720	RAP80 RXRIP110	719	79727
DCUN1D1	DCN1-like protein 1	UPS	ubiquitin and UBL binding	E3 ligase: NEDDylation	UBA		IPR009060	IPR005176	Q96GG9	54165	DCN1 DCUN1L1 RP42 SCCRO	259	30124
DCUN1D2	DCN1-like protein 2	UPS	ubiquitin and UBL binding	E3 ligase: NEDDylation	UBA		IPR009060	IPR005176	Q6PH85	55208	C13orf17 DCUN1L2	259	30179
CBX4	E3 SUMO-protein ligase CBX4	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	SIM		PMID: 20098713 (SIM)	(none noted)	O00257	8535		560	61368
PIAS1	E3 SUMO-protein ligase PIAS1	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	SIM		PMID: 16524884, PMID: 19217413 (SIM)	IPR004181	O75925	8554	DDXBP1	651	71836
PIAS2	E3 SUMO-protein ligase PIAS2	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	SIM		PMID: 16524884, PMID: 19217413 (SIM)	IPR004181	O75928	9063	PIASX	621	68240
PIAS4	E3 SUMO-protein ligase PIAS4	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	SIM		PMID: 28455449 (SIM)	IPR004181	Q8N2W9	51588	PIASG	510	56504
RANBP2	E3 SUMO-protein ligase RanBP2	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	RanBP2-type ZnF & SIM		IPR001876, IPR036443, PMID: 28039207 (SIM)	IPR022011	P49792	5903	NUP358	3224	358199
ZNF451	E3 SUMO-protein ligase ZNF451	UPS	ubiquitin and UBL binding	E3 ligase: SUMOylation	UIM, SIM		PMID: 18656483 (UIM), PMID: 26524494 (SIM)	IPR041192	Q9Y4E5	26036	COASTER KIAA0576 KIAA1702	1061	121484
RWDD3	RWD domain-containing protein 3	UPS	ubiquitin and UBL binding	E3 ligase cofactor: SUMOylation	RWD domain		IPR016135, IPR006575	(none noted)	Q9Y3V2	25950	RSUME	267	30543
		UPS	**ubiquitin and UBL binding**	**DUB & E3 ligase**									
TNFAIP3	Tumor necrosis factor alpha-induced protein 3	UPS	ubiquitin and UBL binding	DUB & E3 ligase	OTU & idiosyncratic E3 ligase	A20	IPR002653	IPR003323	P21580	7128	OTUD7C	790	89614
		UPS	**ubiquitin and UBL binding**	**DUBs and cofactors**									
USP3	Ubiquitin carboxyl-terminal hydrolase 3	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q9Y6I4	9960		520	58897
USP5	Ubiquitin carboxyl-terminal hydrolase 5	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF & UBA	IPR001607, IPR015940, IPR009060, IPR041812	IPR028889	P45974	8078	ISOT	858	95786
USP13	Ubiquitin carboxyl-terminal hydrolase 13	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF & UBA	IPR001607, IPR015940, IPR009060	IPR028889	Q92995	8975	ISOT3	863	97327
USP16	Ubiquitin carboxyl-terminal hydrolase 16	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q9Y5T5	10600		823	93570
USP20	Ubiquitin carboxyl-terminal hydrolase 20	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q9Y2K6	10868	KIAA1003 LSFR3A VDU2	914	102003
USP22	Ubiquitin carboxyl-terminal hydrolase 22	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q9UPT9	23326	KIAA1063 USP3L	525	59961
USP33	Ubiquitin carboxyl-terminal hydrolase 33	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q8TEY7	23032	KIAA1097 VDU1	942	106727
USP39	U4/U6.U5 tri-snRNP-associated protein 2	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q53GS9	10713		565	65381
USP44	Ubiquitin carboxyl-terminal hydrolase 44	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q9H0E7	84101		712	81185
USP45	Ubiquitin carboxyl-terminal hydrolase 45	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q70EL2	85015		814	91733
USP49	Ubiquitin carboxyl-terminal hydrolase 49	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q70CQ1	25862		688	79198
USP51	Ubiquitin carboxyl-terminal hydrolase 51	UPS	ubiquitin and UBL binding	DUB	USP	UBP-associated ZnF	IPR001607	IPR028889	Q70EK9	158880		711	79756
USP7	Ubiquitin carboxyl-terminal hydrolase 7	UPS	ubiquitin and UBL binding	DUB	USP	SIM	PMID: 26950370 (SIM)	IPR028889	Q93009	7874	HAUSP	1102	128302
USP24	Ubiquitin carboxyl-terminal hydrolase 24	UPS	ubiquitin and UBL binding	DUB	USP	UBA	IPR015940, IPR009060, IPR033382	IPR028889	Q9UPU5	23358	KIAA1057	2620	294365
USP25	Ubiquitin carboxyl-terminal hydrolase 25	UPS	ubiquitin and UBL binding	DUB	USP	UBA, UIM, SIM	IPR009060, IPR003903, PMID: 18538659 (SIM)	IPR028889	Q9UHP3	29761	USP21	1055	122218
USP28	Ubiquitin carboxyl-terminal hydrolase 28	UPS	ubiquitin and UBL binding	DUB	USP	UBA, UIM	IPR009060, UIM: by analogy with USP25	IPR028889	Q96RU2	57646	KIAA1515	1077	122491
USP37	Ubiquitin carboxyl-terminal hydrolase 37	UPS	ubiquitin and UBL binding	DUB	USP	UIM	IPR003903	IPR028889	Q86T82	57695	KIAA1594	979	110170
OTUD1	OTU domain-containing protein 1	UPS	ubiquitin and UBL binding	DUB	OTU	UIM	PMID: 28216291, PMID: 23827681 (UIM)	IPR003323	Q5VV17	220213	DUBA7 OTDC1	481	51063
OTUD5	OTU domain-containing protein 5	UPS	ubiquitin and UBL binding	DUB	OTU	UIM	PMID: 32826889 (UIM)	IPR003323	Q96G74	55593		571	60626
OTUD7A	OTU domain-containing protein 7A	UPS	ubiquitin and UBL binding	DUB	OTU	UBA & A20	cd14347, IPR002653	IPR003323	Q8TE49	161725	C15orf16 CEZANNE2 OTUD7	926	100677
OTUD7B	OTU domain-containing protein 7B	UPS	ubiquitin and UBL binding	DUB	OTU	UBA & A20	cd14347, IPR002653	IPR003323	Q6GQQ9	56957	ZA20D1	843	92526
ZRANB1	Ubiquitin thioesterase ZRANB1	UPS	ubiquitin and UBL binding	DUB	OTU	RanBP2-type ZnF	IPR001876, IPR036443	IPR003323	Q9UGI0	54764	TRABID	708	80967
NPLOC4	Nuclear protein localization protein 4 homolog	UPS	ubiquitin and UBL binding	DUB	MPN & UBL	RanBP2-type ZnF	IPR001876, IPR036443	IPR037518, IPR024682	Q8TAT6	55666	KIAA1499 NPL4	608	68120
ATXN3	Ataxin-3	UPS	ubiquitin and UBL binding	DUB	Josephin	UIM, SIM	IPR003903, PMID: 30460066 (SIM)	IPR006155	P54252	4287	ATX3 MJD MJD1 SCA3	361	41250
ATXN3L	Ataxin-3-like protein	UPS	ubiquitin and UBL binding	DUB	Josephin	UIM	IPR003903	IPR006155	Q9H3M9	92552	ATX3L MJDL	355	40747
MINDY1	Ubiquitin carboxyl-terminal hydrolase MINDY-1	UPS	ubiquitin and UBL binding	DUB	MINDY	MIU	PMID: 27292798 (MIU)	IPR033979	Q8N5J2	55793	FAM63A KIAA1390	469	51778
MINDY2	Ubiquitin carboxyl-terminal hydrolase MINDY-2	UPS	ubiquitin and UBL binding	DUB	MINDY	MIU	MIU: by analogy with Hs MINDY1	IPR033979	Q8NBR6	54629	FAM63B KIAA1164	621	67106
SENP1	Sentrin-specific protease 1	UPS	ubiquitin and UBL binding	DUB	SENP	SIM	PMID: 23175280 (SIM)	IPR003653	Q9P0U3	29843		644	73481
SENP2	Sentrin-specific protease 2	UPS	ubiquitin and UBL binding	DUB	SENP	SIM	PMID: 23175280 (SIM)	IPR003653	Q9HC62	59343	KIAA1331	589	67855
SENP6	Sentrin-specific protease 6	UPS	ubiquitin and UBL binding	DUB	SENP	SIM	PMID: 23175280 (SIM)	IPR003653	Q9GZR1	26054	KIAA0797 SSP1 SUSP1	1112	126146

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
SENP7	Sentrin-specific protease 7	UPS	ubiquitin and UBL binding	DUB	SENP	SIM	PMID: 23175280 (SIM)	IPR003653	Q9BQF6	57337	KIAA1707 SSP2 SUSP2	1050	119658
DESI1	Desumoylating isopeptidase 1	UPS	ubiquitin and UBL binding	DUB	PPPDE	SIM	PMID: 23175280 (SIM)	IPR008580	Q6ICB0	27351	FAM152B PPPDE2	168	18263
ZUP1	Zinc finger-containing ubiquitin peptidase 1	UPS	ubiquitin and UBL binding	DUB	idiosyncratic DUB	UBZ, MIU, zUBD	PMID: 35058438 (UBZ, MIU, zUBD)	IPR012462	Q96AP4	221302	C6orf113 ZUFSP	578	65959
TANK	TRAF family member-associated NF-kappa-B activator	UPS	ubiquitin and UBL binding	DUB cofactor		UBZ	IPR041641	(none noted)	Q92844	10010	ITRAF TRAF2	425	47816
		UPS	**ubiquitin and UBL binding**	**protein kinases & regulators**									
MARK1	Serine/threonine-protein kinase MARK1	UPS	ubiquitin and UBL binding	protein kinases & regulators	microtubule-associated Ser/Thr kinases	UBA	IPR015940	IPR000719	Q9P0L2	4139	KIAA1477 MARK	795	89003
MARK2	Serine/threonine-protein kinase MARK2	UPS	ubiquitin and UBL binding	protein kinases & regulators	microtubule-associated Ser/Thr kinases	UBA	IPR015940	IPR000719	Q7KZI7	2011	EMK1	788	87911
MARK3	MAP/microtubule affinity-regulating kinase 3	UPS	ubiquitin and UBL binding	protein kinases & regulators	microtubule-associated Ser/Thr kinases	UBA	IPR015940	IPR000719	P27448	4140	CTAK1 EMK2	753	84429
MARK4	MAP/microtubule affinity-regulating kinase 4	UPS	ubiquitin and UBL binding	protein kinases & regulators	microtubule-associated Ser/Thr kinases	UBA	IPR015940	IPR000719	Q96L34	57787	KIAA1860 MARKL1	752	82520
PRKAA1	5'-AMP-activated protein kinase catalytic subunit alpha-1	UPS	ubiquitin and UBL binding	protein kinases & regulators	AMP-activated Ser/Thr kinases	UBA	IPR028797	IPR000719	Q13131	5562	AMPK1	559	64009
PRKAA2	5'-AMP-activated protein kinase catalytic subunit alpha-2	UPS	ubiquitin and UBL binding	protein kinases & regulators	AMP-activated Ser/Thr kinases	UBA	IPR028783	IPR000719	P54646	5563	AMPK AMPK2	552	62320
SIK1B	Putative serine/threonine-protein kinase SIK1B	UPS	ubiquitin and UBL binding	protein kinases & regulators	salt-inducible Ser/Thr kinases	UBA	IPR015940	IPR034672	A0A0B4J2F2	102724428		783	84930
SIK1	Serine/threonine-protein kinase SIK1	UPS	ubiquitin and UBL binding	protein kinases & regulators	salt-inducible Ser/Thr kinases	UBA	IPR015940	IPR034672	P57059	150094	SIK SNF1LK	783	84902
SIK2	Serine/threonine-protein kinase SIK2	UPS	ubiquitin and UBL binding	protein kinases & regulators	salt-inducible Ser/Thr kinases	UBA	IPR015940	IPR034672	Q9H0K1	23235	KIAA0781 QIK SNF1LK2	926	103915
SIK3	Serine/threonine-protein kinase SIK3	UPS	ubiquitin and UBL binding	protein kinases & regulators	salt-inducible Ser/Thr kinases	UBA	IPR015940	IPR034672	Q9Y2K2	23387	KIAA0999 QSK	1321	144851
BRSK1	Serine/threonine-protein kinase BRSK1	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	IPR015940	IPR000719	Q8TDC3	84446	KIAA1811 SAD1 SADB	778	85087
BRSK2	Serine/threonine-protein kinase BRSK2	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	cd14340	IPR000719	Q8IWQ3	9024	C11orf7 PEN11B SADA STK29	736	81633
LATS1	Serine/threonine-protein kinase LATS1	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	IPR015940, IPR009060	IPR000961	O95835	9113	WARTS	1130	126870
LATS2	Serine/threonine-protein kinase LATS2	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	IPR015940, IPR009060	IPR000961	Q9NRM7	26524	KPM	1088	120136
TNK1	Non-receptor tyrosine-protein kinase TNK1	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	cd14328	IPR020635	Q13470	8711		666	72468
TNK2	Activated CDC42 kinase 1	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	IPR030220	IPR020635	Q07912	10188	ACK1	1038	114569
SNRK	SNF-related serine/threonine-protein kinase	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	UBA	IPR015940	IPR000719	Q9NRH2	54861	KIAA0096 SNFRK	765	84276
RIOK3	Serine/threonine-protein kinase RIO3	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	MIU	MIU @ 41-55, 76-92 (unpublished)	IPR011009	O14730	8780	SUDD	519	59093
EIF2AK4	eIF-2-alpha kinase GCN2	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	RWD domain	IPR016135, IPR006575	IPR000719	Q9P2K8	440275	GCN2 KIAA1338	1649	186911
CDK2	Cyclin-dependent kinase 2	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	SIM	PMID: 27163259 (SIM)	IPR000719	P24941	1017	CDKN2	298	33930
HIPK2	Homeodomain-interacting protein kinase 2	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	SIM	PMID: 21192925 (SIM)	IPR000719	Q9H2X6	28996		1198	130966
PLK1	Serine/threonine-protein kinase PLK1	UPS	ubiquitin and UBL binding	protein kinases & regulators	other Ser/Thr kinase	SIM	PMID: 27230136 (SIM)	IPR000719	P53350	5347	PLK	603	68255
WDR59	GATOR complex protein WDR59	UPS	ubiquitin and UBL binding	protein kinases & regulators	GATOR2 complex	RWD domain	IPR016135, IPR006575	(none noted)	Q6PJI9	79726	KIAA1923	974	109793
		UPS	**ubiquitin and UBL binding**	**protein phosphatases**									
UBASH3B	Ubiquitin-associated and SH3 domain-containing protein B	UPS	ubiquitin and UBL binding	protein phosphatases	Tyr phosphatase	UBA	IPR015940, IPR009060	IPR029033	Q8TF42	84959	KIAA1959 STS1	649	72696
UBASH3A	Ubiquitin-associated and SH3 domain-containing protein A	UPS	ubiquitin and UBL binding	protein phosphatases	Tyr phosphatase	UBA	IPR015940, IPR009060	IPR029033	P57075	53347	STS2	661	74123
		UPS	**ubiquitin and UBL binding**	**other protein modifiers**									
DPP9	Dipeptidyl peptidase 9	UPS	ubiquitin and UBL binding	other protein modifiers	dipeptidyl peptidase	SIM	PMID: 31417085 (SIM)		Q86TI2	91039	DPRP2	863	98263
HDAC6	Histone deacetylase 6	UPS	ubiquitin and UBL binding	other protein modifiers	histone deacetylase	UBP-associated ZnF	IPR001607	IPR023801	Q9UBN7	10013	KIAA0901	1215	131419
HYPK	Huntingtin-interacting protein K	UPS	ubiquitin and UBL binding	other protein modifiers	N-terminal acetylation	UBA	IPR044034, IPR038922	(none noted)	Q9NX55	25764	C15orf63	121	13651
PARP10	Protein mono-ADP-ribosyltransferase PARP10	UPS	ubiquitin and UBL binding	other protein modifiers	ADP ribosyltransferase	UIM	PMID: 15674325 (UIM)	IPR012317	Q53GL7	84875		1025	109998
				cytoskeletal associated									
CENPE	Centromere-associated protein E	UPS	ubiquitin and UBL binding	cytoskeletal associated	SIM		PMID: 18374647 (SIM)	IPR001752	Q02224	1062		2701	316415
ZMYM3	Zinc finger MYM-type protein 3	UPS	ubiquitin and UBL binding	cytoskeletal associated	SIM		PMID: 25133527 (SIM)	(none noted)	Q14202	9203	DXS6673E KIAA0385 ZNF261	1370	152379
		UPS	**ubiquitin and UBL binding**	**NPC subunit**									
NUP153	Nuclear pore complex protein Nup153	UPS	ubiquitin and UBL binding	NPC subunit	RanBP2-type ZnF		IPR001876, IPR036443	IPR013913	P49790	9972		1475	153938
		UPS	**ubiquitin and UBL binding**	**DNA repair**									
POLH	DNA polymerase eta	UPS	ubiquitin and UBL binding	DNA repair	DNA polymerase	UBZ	IPR041298	IPR036775	Q9Y253	5429	RAD30 RAD30A XPV	713	78413
POLK	DNA polymerase kappa	UPS	ubiquitin and UBL binding	DNA repair	DNA polymerase	UBZ	IPR006642	IPR036775	Q9UBT6	51426	DINB1	870	98809
POLI	DNA polymerase iota	UPS	ubiquitin and UBL binding	DNA repair	DNA polymerase	UBM	PMID: 16357261 (UBM)	IPR036775	Q9UNA4	11201	RAD30B	740	83006
REV1	DNA repair protein REV1	UPS	ubiquitin and UBL binding	DNA repair	dCTP transferase	UBM	PMID: 16357261 (UBM)	IPR036775	Q9UBZ9	51455	REV1L	1251	138248
ERCC5	DNA excision repair protein ERCC-5	UPS	ubiquitin and UBL binding	DNA repair	DNA endonuclease	UBM	PMID: 19213613, PMID: 22815677 (UBM)	(none noted)	P28715	2073	ERCM2 XPG XPGC	1186	133108

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
SLX4	Structure-specific endonuclease subunit SLX4	UPS	ubiquitin and UBL binding	DNA repair	DNA endonuclease cofactor	UBZ & UIM & SIM	IPR006642, UIM @ 413-433 (unpublished), PMID: 25533188 (SIM)	(none noted)	Q8IY92	84464	BTBD12 KIAA1784 KIAA1987	1834	200012
DCLRE1A	DNA cross-link repair 1A protein	UPS	ubiquitin and UBL binding	DNA repair	DNA exonuclease	UBZ	IPR006642	IPR011084	Q6PJP8	9937	KIAA0086 SNM1 SNM1A	1040	116400
FAN1	Fanconi-associated nuclease 1	UPS	ubiquitin and UBL binding	DNA repair	DNA exonuclease	UBZ	IPR006642	(none noted)	Q9Y2M0	22909	KIAA1018 MTMR15	1017	114225
FAAP20	Fanconi anemia core complex-associated protein 20	UPS	ubiquitin and UBL binding	DNA repair	DNA repair accessory	UBZ	IPR031490	IPR031491	Q6NZ36	199990	C1orf86	180	19869
XRCC4	DNA repair protein XRCC4	UPS	ubiquitin and UBL binding	DNA repair	DNA repair accessory	SIM	PMID: 33503430, PMID: 35420136 (SIM)	(none noted)	Q13426	7518		336	38287
NEIL3	Endonuclease 8-like 3	UPS	ubiquitin and UBL binding	DNA repair	DNA glycosylase	RanBP2-type ZnF	IPR001876, IPR036443	IPR012319	Q8TAT5	55247		605	67769
TDG	G/T mismatch-specific thymine DNA glycosylase	UPS	ubiquitin and UBL binding	DNA repair	DNA glycosylase	SIM	PMID: 26917720 (SIM)		Q13569	6996		410	46053
ERCC6L	DNA excision repair protein ERCC-6-like	UPS	ubiquitin and UBL binding	DNA repair	DNA helicase	SIM	PMID: 27230136 (SIM)		Q2NKX8	54821	PICH	1250	141103
TDP2	Tyrosyl-DNA phosphodiesterase 2	UPS	ubiquitin and UBL binding	DNA repair	5'-tyrosyl DNA phosphodiesterase	UBA	IPR009060	IPR005135	O95551	51567	EAP2 TTRAP	362	40930
UBAP2	Ubiquitin-associated protein 2	UPS	ubiquitin and UBL binding	DNA repair	RNA polymerase II removal	UBA	IPR015940, IPR009060	(none noted)	Q5T6F2	55833	KIAA1491	1119	117116
UBAP2L	Ubiquitin-associated protein 2-like	UPS	ubiquitin and UBL binding	DNA repair	RNA polymerase II removal	UBA	IPR015940, IPR009060	(none noted)	Q14157	9898	KIAA0144 NICE4	1087	114535
		UPS	**ubiquitin and UBL binding**	**DNA replication**									
RFC1	Replication factor C subunit 1	UPS	ubiquitin and UBL binding	DNA replication	DNA polymerase clamp loader	MIU	https://doi.org/10.1101/2023.01.10.523363 (MIU)	IPR003593	P35251	5981	RFC140	1148	128255
WRNIP1	ATPase WRNIP1	UPS	ubiquitin and UBL binding	DNA replication	DNA polymerase accessory	UBZ	IPR006642, IPR040539	IPR003593	Q96S55	56897	WHIP	665	72133
ZRANB3	DNA annealing helicase and endonuclease ZRANB3	UPS	ubiquitin and UBL binding	DNA replication	DNE endonuclease and helicase	RanBP2-type ZnF	IPR001876, IPR036443	IPR014001	Q5FWF4	84083		1079	123248
		UPS	**ubiquitin and UBL binding**	**assorted DNA dependent processes**									
N4BP2	NEDD4-binding protein 2	UPS	ubiquitin and UBL binding	DNA dependent processes	DNA nicking endonuclease	UBA	IPR009060, IPR003892, IPR041801	(none noted)	Q86UW6	55728	B3BP KIAA1413	1770	198801
SMARCAD1	SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A containing DEAD/H box 1	UPS	ubiquitin and UBL binding	DNA dependent processes	chromatin remodeling	UBA	IPR003892	IPR014001	Q9H4L7	56916	KIAA1122	1026	117402
		UPS	**ubiquitin and UBL binding**	**DNA & RNA dependent processes**									
FUS	RNA-binding protein FUS	UPS	ubiquitin and UBL binding	DNA & RNA dependent processes	DNA/RNA binding protein	RanBP2-type ZnF	IPR001876, IPR036443	IPR000504, IPR035979	P35637	2521	TLS	526	53426
		UPS	**ubiquitin and UBL binding**	**transcription**									
TAF15	TATA-binding protein-associated factor 2N	UPS	ubiquitin and UBL binding	transcription	initiation	RanBP2-type ZnF	IPR001876, IPR036443	IPR000504, IPR035979	Q92804	8148	RBP56 TAF2N	592	61830
EWSR1	RNA-binding protein EWS	UPS	ubiquitin and UBL binding	transcription	repression	RanBP2-type ZnF	IPR001876, IPR036443	IPR000504, IPR035979	Q01844	2130	EWS	656	68478
RYBP	RING1 and YY1-binding protein	UPS	ubiquitin and UBL binding	transcription	repression	RanBP2-type ZnF	IPR001876, IPR036443	IPR033774	Q8N488	23429	DEDAF YEAF1	228	24822
TEX13A	Testis-expressed protein 13A	UPS	ubiquitin and UBL binding	transcription	repression	RanBP2-type ZnF	IPR001876, IPR036443	(none noted)	Q9BXU3	56157		409	45583
TEX13C	Putative testis-expressed protein 13C	UPS	ubiquitin and UBL binding	transcription	repression	RanBP2-type ZnF	IPR001876	(none noted)	A0A0J9YWL9	100129520		993	109806
TEX13D	Testis-expressed protein 13D	UPS	ubiquitin and UBL binding	transcription	repression	RanBP2-type ZnF	IPR001876	(none noted)	A0A0J9YYS4	100132015		714	78886
YAF2	YY1-associated factor 2	UPS	ubiquitin and UBL binding	transcription	coactivation and corepression	RanBP2-type ZnF	IPR001876, IPR036443	IPR033774	Q8IY57	10138		180	19901
ATXN7	Ataxin-7	UPS	ubiquitin and UBL binding	transcription	activation	SCA7	IPR013243	(none noted)	O15265	6314	SCA7	892	95451
ATXN7L3	Ataxin-7-like protein 3	UPS	ubiquitin and UBL binding	transcription	activation	SCA7	IPR013243	(none noted)	Q14CW9	56970		347	38651
DMRT3	Doublesex- and mab-3-related transcription factor 3	UPS	ubiquitin and UBL binding	transcription	activation (probable)	UBA	IPR009060, IPR005173	IPR001275	Q9NQL9	58524	DMRTA3	472	51199
DMRTA1	Doublesex- and mab-3-related transcription factor A1	UPS	ubiquitin and UBL binding	transcription	DNA binding	UBA	IPR009060, IPR005173	IPR001275	Q5VZB9	63951	DMO	504	53125
DMRTA2	Doublesex- and mab-3-related transcription factor A2	UPS	ubiquitin and UBL binding	transcription	DNA binding	UBA	IPR009060, IPR005173	IPR001275	Q96SC8	63950	DMRT5	542	53356
TDRD3	Tudor domain-containing protein 3	UPS	ubiquitin and UBL binding	transcription	activation	UBA	IPR015940, IPR009060, IPR041915	(none noted)	Q9H7E2	81550		651	73185
ATF7IP	Activating transcription factor 7-interacting protein 1	UPS	ubiquitin and UBL binding	transcription	activation and repression	SIM	PMID: 18842587 (SIM)		Q6VMQ6	55729	MCAF MCAF1	1270	136394
CREBBP	CREB-binding protein	UPS	ubiquitin and UBL binding	transcription	activation	SIM	PMID: 27129204 (SIM)	new to UPS PN	Q92793	1387	CBP	2442	265351
MYB	Transcriptional activator Myb	UPS	ubiquitin and UBL binding	transcription	activation	SIM	PMID: 20802522 (SIM)	new to UPS PN	P10242	4602		640	72341
ZCCHC12	Zinc finger CCHC domain-containing protein 12	UPS	ubiquitin and UBL binding	transcription	coactivation	SIM	PMID: 19416967 (SIM)	new to UPS PN	Q6PEW1	170261	SIZN1	402	45369
KLF4	Krueppel-like factor 4	UPS	ubiquitin and UBL binding	transcription	activation and repression	SIM	PMID: 20584900 (SIM)	new to UPS PN	O43474	9314	EZF GKLF	513	54671
MTA1	Metastasis-associated protein MTA1	UPS	ubiquitin and UBL binding	transcription	coactivation and corepression	SIM	PMID: 21965678 (SIM)	new to UPS PN	Q13330	9112		715	80786
YAP1	Transcriptional coactivator YAP1	UPS	ubiquitin and UBL binding	transcription	coactivation and corepression	SIM	PMID: 30472188 (SIM)	new to UPS PN	P46937	10413	YAP65	504	54462
SETDB1	Histone-lysine N-methyltransferase SETDB1	UPS	ubiquitin and UBL binding	transcription	repression	SIM	PMID: 23782009 (SIM)	new to UPS PN	Q15047	9869	ESET KIAA0067 KMT1E	1291	143157
ZMYM2	Zinc finger MYM-type protein 2	UPS	ubiquitin and UBL binding	transcription	repression	SIM	PMID: 25133527 (SIM)	new to UPS PN	Q9UBW7	7750	FIM RAMP ZNF198	1377	154911
RCOR1	REST corepressor 1	UPS	ubiquitin and UBL binding	transcription	corepression	SIM	PMID: 19394292 (SIM)	new to UPS PN	Q9UKL0	23186	KIAA0071 RCOR	485	53327
		UPS	**ubiquitin and UBL binding**	**mRNA maturation**									
RBM5	RNA-binding protein 5	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	RanBP2-type ZnF	IPR001876, IPR036443	IPR000504, IPR035979	P52756	10181		815	92154
RBM6	RNA-binding protein 6	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	RanBP2-type ZnF	RanBP2-type ZnF: by analogy with Hs RBM5	IPR000504, IPR035979	P78332	10180	DEF3	1123	128644
RBM10	RNA-binding protein 10	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	RanBP2-type ZnF	IPR001876, IPR036443	IPR000504, IPR035979	P98175	8241	DXS8237E GPATC9 GPATCH9 KIAA0122	930	103533
ZRANB2	Zinc finger Ran-binding domain-containing protein 2	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	RanBP2-type ZnF	IPR001876, IPR036443	(none noted)	O95218	9406	ZIS ZNF265	330	37404
RBM44	RNA-binding protein 44	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	UBA	UBA @ 994-1046 (unpublished)	IPR000504, IPR035979	Q6ZP01	375316		1051	117985

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
SMN1	Survival motor neuron protein	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	SIM	PMID: 24413165 (SIM)	IPR002999	Q16637	6606	SMN SMNT	294	31849
PRPF8	Pre-mRNA-processing-splicing factor 8	UPS	ubiquitin and UBL binding	mRNA maturation	mRNA splicing	idiosyncratic	PMID: 16428608 (MPN)	IPR037518	Q6P2Q9	10594	PRPC8	2335	273600
		UPS	**ubiquitin and UBL binding**	**mRNA export**									
NXF1	Nuclear RNA export factor 1	UPS	ubiquitin and UBL binding	mRNA export	UBA		IPR009060, IPR005637	IPR015245, IPR035979	Q9UBU9	10482	TAP	619	70182
NXF2	Nuclear RNA export factor 2	UPS	ubiquitin and UBL binding	mRNA export	UBA		IPR009060, IPR005637	IPR015245, IPR035979	Q9GZY0	56001	TAPL2	626	71627
		UPS	**ubiquitin and UBL binding**	**mRNA decay**									
ZC3H12A	Endoribonuclease ZC3H12A	UPS	ubiquitin and UBL binding	mRNA decay	UBA		IPR040546	IPR021869	Q5D1E8	80149	MCPIP MCPIP1	599	65699
ZC3H12B	Probable ribonuclease ZC3H12B	UPS	ubiquitin and UBL binding	mRNA decay (putative)	UBA		IPR040546	IPR021869	Q5HYM0	340554	CXorf32 MCPIP2	836	94205
ZC3H12C	Probable ribonuclease ZC3H12C	UPS	ubiquitin and UBL binding	mRNA decay (putative)	UBA		IPR040546	IPR021869	Q9C0D7	85463	KIAA1726 MCPIP3	883	99340
ZC3H12D	Probable ribonuclease ZC3H12D	UPS	ubiquitin and UBL binding	mRNA decay (putative)	UBA		IPR040546	IPR021869	A2A288	340152	C6orf95 MCPIP4 TFL	527	58078
		UPS	**ubiquitin and UBL binding**	**translation**									
TNRC6C	Trinucleotide repeat-containing gene 6C protein	UPS	ubiquitin and UBL binding	translation	repression	UBA	IPR015940, IPR009060, IPR041917	IPR034927, IPR035979	Q9HCJ0	57690	KIAA1582	1690	175964
ASCC2	Activating signal cointegrator 1 complex subunit 2	UPS	ubiquitin and UBL binding	translation	ribosome QC & DNA repair	UBA	IPR009060, IPR003892	(none noted)	Q9H1I8	84164	ASC1P100, RQT3	757	86360
TRIP4	Activating signal cointegrator 1	UPS	ubiquitin and UBL binding	translation	ribosome QC & transcriptional activation	idiosyncratic	by analogy with yeast RQT4 (PMID: 36627279)		Q15650	9325	RQT4	581	66146
HBS1L	HBS1-like protein	UPS	ubiquitin and UBL binding	translation	translation QC factor	UBA	IPR015033	(none noted)	Q9Y450	10767	HBS1 KIAA1038	684	75473
NACA	Nascent polypeptide-associated complex subunit alpha	UPS	ubiquitin and UBL binding	translation	nascent peptide binding	UBA	IPR044034	IPR002715	Q13765	4666		215	23384
NACA	Nascent polypeptide-associated complex subunit alpha	UPS	ubiquitin and UBL binding	translation	nascent peptide binding	UBA	IPR044034	IPR002715	E9PAV3	4666		2078	205422
NACAD	NAC-alpha domain-containing protein 1	UPS	ubiquitin and UBL binding	translation	nascent peptide binding	UBA	IPR044034, IPR041907	IPR002715	O15069	23148	KIAA0363	1562	161101
NACA2	Nascent polypeptide-associated complex subunit alpha-2	UPS	ubiquitin and UBL binding	translation	nascent peptide binding	UBA	IPR044034	IPR002715	Q9H009	342538	NACAL	215	23223
TSFM	Elongation factor Ts	UPS	ubiquitin and UBL binding	translation	mitochondrial	UBA	IPR009060	IPR014039	P43897	10102		325	35391
HEMK1	MTRF1L release factor glutamine methyltransferase	UPS	ubiquitin and UBL binding	translation	mitochondrial	UBA	IPR040758	IPR007848	Q9Y5R4	51409	HEMK	338	38231
IMPACT	Protein IMPACT	UPS	ubiquitin and UBL binding	translation	translational upregulation	RWD domain	IPR016135, IPR006575	IPR001498	Q9P2X3	55364		320	36476
		UPS	**ubiquitin and UBL binding**	**NF-kappaB signalling**									
IKBKG	NF-kappa-B essential modulator	UPS	ubiquitin and UBL binding	NF-kappaB signalling	UBAN & NEMO-type ZnF		IPR032419, IPR034735	(none noted)	Q9Y6K9	8517	FIP3 NEMO	419	48198
TNIP2	TNFAIP3-interacting protein 2	UPS	ubiquitin and UBL binding	NF-kappaB signalling	UBAN & NEMO-type ZnF		PMID: 18212736 (UBAN), IPR034735	(none noted)	Q8NFZ5	79155	ABIN2 FLIP1	429	48700
TNIP1	TNFAIP3-interacting protein 1	UPS	ubiquitin and UBL binding	NF-kappaB signalling	UBAN		PMID: 18212736 (UBAN)	(none noted)	Q15025	10318	KIAA0113 NAF1	636	71864
TNIP3	TNFAIP3-interacting protein 3	UPS	ubiquitin and UBL binding	NF-kappaB signalling	UBAN		IPR032419	(none noted)	Q96KP6	79931	ABIN3 LIND	325	38943
TBKBP1	TANK-binding kinase 1-binding protein 1	UPS	ubiquitin and UBL binding	NF-kappaB signalling	UBZ		IPR041641	(none noted)	A7MCY6	9755	KIAA0775 SINTBAD	615	67702
TAB2	TGF-beta-activated kinase 1 and MAP3K7-binding protein 2	UPS	ubiquitin and UBL binding	NF-kappaB signalling	RanBP2-type ZnF		IPR003892, IPR041911, IPR001876, IPR036443	(none noted)	Q9NYJ8	23118	KIAA0733 MAP3K7IP2	693	76494
TAB3	TGF-beta-activated kinase 1 and MAP3K7-binding protein 3	UPS	ubiquitin and UBL binding	NF-kappaB signalling	RanBP2-type ZnF		IPR003892, IPR041911, IPR001876, IPR036443	(none noted)	Q8N5C8	257397	MAP3K7IP3	712	78653
		UPS	**ubiquitin and UBL binding**	**assorted processes**									
ATXN7L1	Ataxin-7-like protein 1	UPS	ubiquitin and UBL binding	assorted processes	SCA7		IPR013243	(none noted)	Q9ULK2	222255	ATXN7L4 KIAA1218	861	91514
ATXN7L2	Ataxin-7-like protein 2	UPS	ubiquitin and UBL binding	assorted processes	SCA7		IPR013243	(none noted)	Q5T6C5	127002		722	77181
RWDD1	RWD domain-containing protein 1	UPS	ubiquitin and UBL binding	assorted processes	RWD domain		IPR016135, IPR006575, IPR040213	(none noted)	Q9H446	51389	DFRP2	243	27940
RWDD2A	RWD domain-containing protein 2A	UPS	ubiquitin and UBL binding	assorted processes	RWD domain		IPR016135, IPR006575	(none noted)	Q9UIY3	112611	RWDD2	292	33893
RWDD2B	RWD domain-containing protein 2B	UPS	ubiquitin and UBL binding	assorted processes	RWD domain		IPR016135, IPR006575	(none noted)	P57060	10069	C21orf6	319	36332
RWDD4	RWD domain-containing protein 4	UPS	ubiquitin and UBL binding	assorted processes	RWD domain		IPR016135, IPR006575, IPR042770	(none noted)	Q6NW29	201965	FAM28A RWDD4A	188	21251
DHX57	Putative ATP-dependent RNA helicase DHX57	UPS	ubiquitin and UBL binding	assorted processes	UBA, RWD domain		IPR015940, IPR009060, IPR042615, IPR006575	IPR011545, IPR014001	Q6P158	90957		1386	155604
N4BP1	NEDD4-binding protein 1	UPS	ubiquitin and UBL binding	assorted processes	UBA		PMID: 33654074 (UBA)	IPR021869	O75113	9683	KIAA0615	896	100379
KHNYN	Protein KHNYN	UPS	ubiquitin and UBL binding	assorted processes	UBA		PMID: 36633408 (UBA)	IPR021869	O15037	23351	KIAA0323	678	74534
UBAC2	Ubiquitin-associated domain-containing protein 2	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR015940, IPR009060, IPR041928	(none noted)	Q8NBM4	337867	PHGDHL1	344	38964
CUEDC1	CUE domain-containing protein 1	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060, IPR003892, IPR040195	(none noted)	Q9NWM3	404093		386	42258
CUEDC2	CUE domain-containing protein 2	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR003892, IPR039805	(none noted)	Q9H467	79004	C10orf66	287	32009
ILRUN	Protein ILRUN	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060, IPR039517	(none noted)	Q9H6K1	64771	C6orf106	298	32872
SPATS2	Spermatogenesis-associated serine-rich protein 2	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060	(none noted)	Q86XZ4	65244	SCR59 SPATA10	545	59545
SPATS2L	SPATS2-like protein	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060	(none noted)	Q9NUQ6	26010	DNAPTP6	558	61729
UBALD1	UBA-like domain-containing protein 1	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060	(none noted)	Q8TB05	124402	FAM100A	177	18954
UBALD2	UBA-like domain-containing protein 2	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR009060	(none noted)	Q8IYN6	283991	FAM100B	164	17877
UBAP1L	Ubiquitin-associated protein 1-like	UPS	ubiquitin and UBL binding	assorted processes	UBA		IPR042575	(none noted)	F5GYI3	390595		381	40592
RHBDD3	Rhomboid domain-containing protein 3	UPS	ubiquitin and UBL binding	assorted processes	UBA & UIM		IPR015940, IPR009060, UIM @ 292-311 (unpublished)	(none noted)	Q9Y3P4	25807	C22orf3	386	40484
UBE2DNL	Putative ubiquitin-conjugating enzyme E2 D2-like protein	UPS	ubiquitin and UBL binding	assorted processes	UEV		IPR016135, IPR000608	(none noted)	Q8IWF7	100131816	UBE2D2L	75	8761
UBE2NL	Putative ubiquitin-conjugating enzyme E2 N-like	UPS	ubiquitin and UBL binding	assorted processes	UEV		IPR016135, IPR000608	(none noted)	Q5JXB2	389898		153	17377

Gene Symbol	Protein Name	Branch	Class	Group	Type	Subtype	Class Domains	Auxilliary domains	UniProt ID	GeneID	Gene Synonyms	Length (aa)	Mass (Da)
RGS17	Regulator of G-protein signaling 17	UPS	ubiquitin and UBL binding	assorted processes	SIM		PMID: 22163035 (SIM)	(none noted)	Q9UGC6	26575	RGSZ2	210	24359
PROKR1	Prokineticin receptor 1	UPS	ubiquitin and UBL binding	assorted processes	SIM		PMID: 29070839 (SIM)	(none noted)	Q8TCW9	10887	GPR73 PKR1	393	44770