S2 (table) | **Receptors and substrates of cullin–RING ligases that have been implicated in diverse biological processes**

Organism	Cullin	Receptor	Implicated substrate	Biological Process	References
S. cerevisiae	Cul1	Cdc4	Cdc6	DNA replication	1–3
			Ctf13	Cell cycle	4
			Far1	Cell cycle	5–7
			Gcn4	Transcription	8–10
			Sic1	Cell cycle	11–14
			Cdc4	Autoregulation	15,16
		Grr1	Cln1/2	Cell cycle	13,17,18
			Gic2	Cell polarity	6,19,20
			Grr1	Autoregulation	15,16
		Met30	Met4	Transcription	21–25
			Met30	Autoregulation	24,26
			Swe1	Cell cycle	27,28
		Mdm30	Fzo1	Mitochondrial shape	29
		Ufo1	Ho	Signal transduction	30,31
		?	Cln3	Cell cycle	11,32
		?	Ste7	Signal transduction	33
		?	Clb5	Cell cycle	11
S. pombe	Cul1	Pop1/Pop2	Cdc18	DNA replication	34–36
			Rum1	Cell cycle	34–36
			Cig2	Cell cycle	37
		?	Mid2p	Cell cycle	38
	Cul3	Btb3	Btb3	Autoregulation	39
	Cul4	?	Spd1	DNA replication	40
C. elegans	Cul1	SEL-10	LIN-12	Signal transduction	41
	Cul2	VHL	HIF-1	Transcription	42
		ZIF-1	PIE-1, POS-1, MEX-1/-5/-6	Development	43
		?	CKI-1	Cell cycle	44
	Cul3	MEL-26	MEI-1	Cell cycle	45–49
	Cul4	?	CDT-1	DNA replication	50
D. melanogaster	Cul1	Archipelago	Cyclin E	Cell cycle	51
			dMyc	Transcription	52
		Morgue	Diap1	Apoptosis	53
		Partner of Paired	Paired	Transcription	54,55
		Slimb	Armadillo	Development	56–59
			Cactus	Transcription	60,61
			Cubitus interruptus	Transcription	56,57,59,62

			Dorsal	Transcription	60
			E2F	DNA replication	63
			Period	Circadian-clock regulation	64,65
			Relish	Transcription	66
			Timeless	Circadian-clock regulation	65
	Cul4	?	Cdt1	DNA replication	67
X. laevis	Cul1	β-TrCP	β-catenin	Development	68–71
			Xom	Development	72
		Tome-1	Wee1	Cell cycle	73,74
		?	Xic1	Cell cycle	75–77
A. thaliana	Cul1	COI1	RPD3b	Transcription	78
			Rubisco (small subunit)	Photorespiration	78
		EBF1/EBF2	EIN3	Transcription	79–81
		SLF-S2	S-RNases	Signal transduction	82
		SLY1	RGA	Signal transduction	83,84
		SKP2	E2Fc	Transcription	85
		TLP9	?	Signal transduction	86
		TIR1	AUX/IAA proteins	Transcription	87–89
		UFO	AGAMOUS	Development	90
		ZTL	TOC1	Circadian-clock regulation	91
	Cul3	ETO1	ACS5	Signal transduction	92
H. sapiens/ M. musculus	Cul1	β-TrCP1 and 2 (FBW1, HOS)	ATF4	Transcription	93,94
			β-catenin	Signal transduction	58,95–98
			CDC25a	Cell cycle	99,100
		+ HIV: Vpu	CD4	Viral modulation	101
			EMI1	Cell cycle	102,103
			IκBα	Transcription	60,95,98, 104–111
			NFκB1/p105, NFκB2/p100	Transcription	112–118
			Prolactin receptor	Signal transduction	119
			SMAD3/4	Signal transduction	120,121

			Type-I interferon receptor (IFNAR1)	Signal transduction	122
			WEE1	Cell cycle	123
		CDC4 (FBW7, SEL10)	Cyclin E	Cell cycle	124,125
			Jun	Transcription	126
			Myc	Transcription	127,128
			Notch1/4	Signal transduction	129,130
			Presenilin-1	Regulation	131
		FBS1 (FBX2, NFB42)	Glycoproteins	Protein quality control	132
			Herpes simplex virus type 1: UL9	Viral modulation	133
		FBS2	*N*-glycans	Protein quality control	134
		FBX4	αB-crystallin	Heat-shock protein	135
		SKP2	B-MYB	Transcription	136
		+ Cyclin T1	CDK9	Transcription	137,138
			CDT1	Cell cycle	50,67, 139–141
			Cyclin D	Cell cycle	142–144
			Cyclin E	Cell cycle	145,146
			Papilloma virus: E7	Viral modulation	147
			E2A	Development	148
			E2F1	Transcription	149
			Myc	Transcription	150
			ORC1	DNA replication	151
			p57	Cell cycle	152
		+CKS1	p130	Cell cycle	153,154
		+CKS1	p21	Cell cycle	142,144,155, 156
		+CKS1	p27	Cell cycle	142,145, 157–160
	Cul2	SOCS1/3	IRS1/2	Signal transduction	161
		SOCS1	TEL-JAK2	Cell cycle	162,163
			VAV	Signal transduction	164
		VHL	HIF1α, HIF2α	Transcription	165–175
			RPB7	Transcription	176
			RPB1	Transcription	177
			VDU1/2	Protein quality control	178,179
			hnRNP A2	Transcription	180
			PKCλ	Signal transduction	181

			STRA13	Transcription	182
	Cul3	RhoBTB2	RhoBTB2	Cell cycle	183
		?	TOP1	DNA replication	184
		KEAP1	NRF2	Transcription	185,186
	Cul4	DET1/COP1	Jun	Transcription	187
		Paramyxovirus: V proteins	STAT1/2	Viral modulation	188
		?	CDT1	DNA replication	67
	Cul5	Adenovirus: E1B-55K, E4ORF6	p53	Viral modulation	189
		HIV: Vif	APOBEC3G	Viral modulation	190

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