Supporting Information for:

Nrf1-mediated transcriptional regulation of the proteasome requires a functional TIP60 complex

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Figure S1

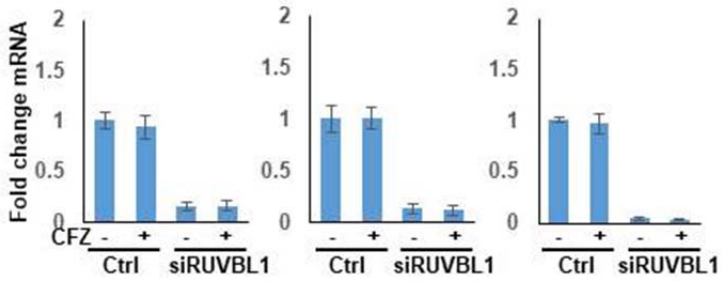

Figure S1. Knock-down efficiency of siRNAs targeting RUVBL1. The cell lines HCT116, MDA-MB-231, and MIA-PaCa2 were either control transfected or with siRUVBL1. Forty-eight hours later, the cells were treated with 200 nM carfilzomib (CFZ) or DMSO control for 8 hours. The cells were then harvested and subjected to quantitative RT-PCR to measure transcript levels of RUVBL1.

Figure S2

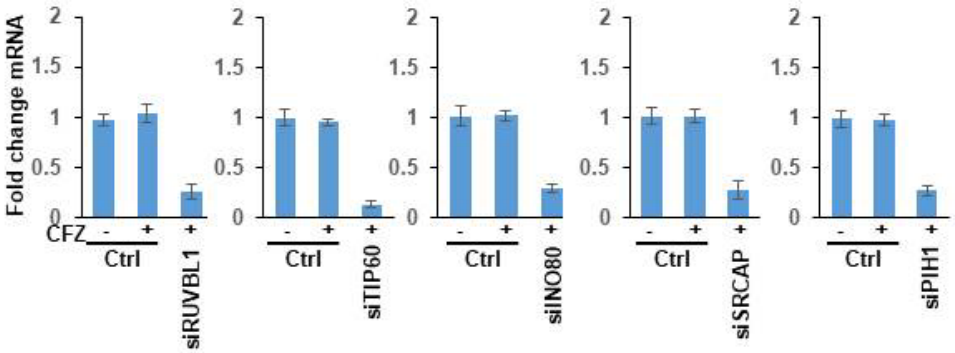

Figure S2. Knock-down efficiency of siRNAs targeting components of various RUVBL1-containing complexes. NIH-3T3 cells were either control transfected or with siRNAs targeting RUVBL1, TIP60, INO80, SRCAP, or PIH1. Forty-eight hours later, the cells were treated with 200 nM carfilzomib (CFZ) or DMSO control for 8 hours. The cells were then harvested and subjected to quantitative RT-PCR to measure indicated transcript levels.

Table S1. Results from an siRNA screen in WT 8xARE-Luc screening system

siRNA target	Treatment	Mean normalized Luciferase Activity	SD (n=3)
-	DMSO	1.00	0.12
-	Carfilzomib (CFZ)	17.72	0.84
DDI2	CFZ	3.27	0.33
Nrf1	CFZ	3.17	0.35
p97	CFZ	3.39	0.28
RUVBL1	CFZ	3.89	0.35
Hsp90aa1	CFZ	12.86	0.65
Baz1a	CFZ	13.19	0.74
Baz1b	CFZ	13.80	0.82
Ash1l	CFZ	13.91	0.56
Zmynd8	CFZ	13.99	0.42
Klf4	CFZ	14.05	0.36
Brd1	CFZ	14.42	0.59
Usp46	CFZ	14.51	0.87
Brd4	CFZ	14.67	0.66
Sqstm1	CFZ	14.82	0.95
Hspb1	CFZ	14.32	0.39
Hcfc1	CFZ	14.60	0.90
Ipo11	CFZ	14.63	0.65
Rbx1	CFZ	14.70	1.53
Sp110	CFZ	14.77	0.88
Smarca2	CFZ	14.87	1.12
Sp140	CFZ	14.88	0.69
Usp44	CFZ	14.89	0.37
Hspa4	CFZ	14.99	0.45
Trim28	CFZ	15.13	0.62
Tsc1	CFZ	15.36	0.57
Ubxn11	CFZ	15.46	0.64
Crebbp	CFZ	15.73	0.53
Plk1	CFZ	15.80	1.36
Brd9	CFZ	15.86	2.14
Baz2a	CFZ	15.90	0.65
Ssrp1	CFZ	15.97	1.46
Brwd3	CFZ	16.23	1.52
Atad2	CFZ	16.32	0.95
Brpf3	CFZ	16.42	0.35
Brd7	CFZ	16.58	1.33
E2f7	CFZ	16.66	1.87
Hspa1a	CFZ	16.70	0.54
Elk1	CFZ	16.84	0.66
Bptf	CFZ	17.39	0.39
Ep300	CFZ	17.75	0.28

Fli1	CFZ	17.77	0.59
Hspa2	CFZ	17.78	1.33
Uba3	CFZ	17.79	2.65
Cecr2	CFZ	17.85	1.95
Ctcf	CFZ	18.28	1.37
Ewsr1	CFZ	18.40	0.87
Pign	CFZ	18.55	2.57
Sp100	CFZ	18.68	3.56
Phip	CFZ	18.71	0.64
Hectd1	CFZ	18.82	1.22
Baz2b	CFZ	18.92	0.94
Brd8	CFZ	19.44	0.67
Fbxo5	CFZ	19.49	1.62
Dnaja2	CFZ	19.75	1.25
Kmt2a	CFZ	19.81	0.68
Zmynd11	CFZ	19.91	1.75
Kat2b	CFZ	20.35	0.69
Hspa8	CFZ	20.51	1.52
Usp9x	CFZ	20.69	0.53
Trim66	CFZ	21.15	2.51
Trim33	CFZ	21.22	0.39
Trim24	CFZ	21.40	0.95
Brd3	CFZ	21.51	3.43
Capn9	CFZ	21.55	1.36
Hsf1	CFZ	21.92	1.41
Ube2m	CFZ	22.32	2.16
Smarca4	CFZ	22.35	2.40
Dnajc17	CFZ	22.60	0.98
Kat2a	CFZ	22.80	1.43
Atad2b	CFZ	22.81	1.67
Brwd1	CFZ	22.98	2.29
Rpn1	CFZ	23.27	1.71
Brdt	CFZ	23.31	3.64
Brd2	CFZ	23.53	1.58
Bag6	CFZ	23.82	0.80
Pbrm1	CFZ	23.92	1.69
Brpf1	CFZ	24.59	2.87
Taf1	CFZ	24.79	1.65
Hsp90ab1	CFZ	25.09	2.36

Table S2. siRNA sequences for the genes targeted in the RNAi screen

Gene	siRNA sequences
Ash1l	GCGAAACAAUGGACAAUUA
	CAAGUAAGCUCGAGUCUGA
	GCUUAAGUAUUGAGUGUAA
	UAGUUGGACUGGUUAAUAA
Atad2	GUAAUCAGCCAGUGUAUUU
	CCUCUAAUAUUGAGAAUGA
	CCGAAGACAGUGAAUCAAA
	AGAAAAGACAGGAUUGUUU
Atad2b	GCACAACUCUGCAAAUAAA
	GAAGAACAGUACCGAGUAU
	GAAAAUACGUUACGAGAGU
	GCGCUACCCUCAGAUCUAU
Bag6	GAUCUGCGCUGCAAUCUAG
	GAGUAUCGCUGCCUUCAUC
	CUGAAUGGGUCCCUAUUAU
	GCACGUGGUUCGGCCUAUG
Baz1a	GACCAAAGCUCAAGGCUGU
	GAAACUCGAUCCCUAAGAG
	GCGCACAGCUUGCCCACUU
	CCAAAUCGGUGGUGCUUUU
Baz1b	GAACGCAUUUGGACGUGUA
	GAGGAGUGAUCUUAUUGAA
	GAACGAAUGCGGAAACACA
	GAGAUACUUCGAUACUUUA
Baz2a	CUUAACAGCUCCACCAUUA
	GUUAAUGGCUUAUCUACUG
	CCAAAGAUGUUCCUAGUCU
	UUCCAGAAGUUAUCAAGUA
Baz2b	GGUAUAAAUGGGUCGGUUA
	CGAUAAUGGCUGCGGAAGA
	CAGAGUAAGAUUAACGAAA
	GGAACAAGGACGUCGCUAU
Bptf	GCAAGACACCGUACGAUGA
	GAACGGAGGAUUCGACAAU
	GAAUAAACCCUACGUUCGA
	CCAAUGAUGCACCGGAUUA
Brd1	GACCGAAGCGAGCUGAUAU
	GGGAGGAACUCUAGCAUCC
	AGACCAAGUCCGAGGAGAA
	GCGGAUUGCAUUUGAUCGA
Brd2	GGAAAGGGCUCAUCGCCUA
	CGGAAGCCCUACACUAUUA
	GAAUUGGGAUCGAUGAAGA

	GAGCUUGAGCGAUAUGUUU
Brd3	GGAGAGAUAUGUCAAGUCU
	GCCCACAGAUGAUAUAGUG
	GCGAAAGACUAACCAACUG
	GGUUAAUGUUCUCGAAUUG
Brd4	GAACCUCCCUGAUUACUAU
	CAACAAACUUCCUGGUGAG
	AAGGAAACCUCAAGCUGAA
	ACAAUCAAGUCUAAACUAG
Brd7	CAAGAUUACCCGUAUGUUA
	GCUACUCCAUGAUUAUUAA
	AGCCAGAGACCAUUUAUUA
	GCUAAUGUGUACUAAUGCA
Brd8	GAUAGUAGCUGGAGUUGGU
	CCAGUGAGCCGCCAGUUAA
	CCUAUGGAUUUGUCAACUA
	GAGAAGGCUAUUUGUCUGA
Brd9	GGACAGGAUUAACCGGUUU
	GCUCCUGGGUAUUCAAUGA
	GCUUUAAGAUGAUGAGCAA
	GUGAUAAUGCGAUGACGUA
Brdt	CAAGAAACAUUUGCCGUAU
	UAAAGCAAGUAGCGAAUCU
	CAGUCAAAGUAACGGAGCA
	CCAACAAAAGAUAGCGGUU
Brpf1	GCAACUGCCUAAAGUAUAA
	GUAAGUACCCUCACCCAAA
	GCAACUAAGCCACCAUAUG
	GCAUGCAUAUCCCUCACAA
Brpf3	CCAACUGCAUGAAGUAUAA
	GCAAGACUGCGUAUUGUGA
	GGACUUUAACCUUAUAGUU
	CUACACCGCUUUCCACGUG
Brwd1	CGAAGAGGUUGGACUGGGA
	UCAUCGAGUCGGAGCUGUA
	UGACCACCUACUACAGAUA
	GGUCUUGUCCAAUAAACAU
Brwd3	GAACAUAGAGCAUAAUUCA
	GGUGAUAGAUUCCGCAGUA
	GCAAUUAACCGGAUGUAGU
	AGACGGAACAGCAAGAAUA
Capn9	GAAGCAAGACGUUCAUCAA
	CCAGAGGAUUUCUUUGAGA
	GGACGGCACUGAAAGCUGC
	CUGGGAUGCUCCAUAGAUA
Cecr2	GAACAGUUGCCACCGCAUA
	CAGGUGCACUCUACUGGUA

	GAGUAGAGAUCCUGCAUCG
	GGAGGUUUAUAUUGUAACA
Crebbp	GGACAGCUGUUUACCAUGA
	GGAAUGAAGUCAAGGUUUG
	GAAAGCAGCUGUGUACAAU
	GCACAAGGAGGUAUUCUUU
Ctcf	GAUGAUAUGUCACACCUUA
	GACGAUACCCAGAUCAUAA
	GGUCGAAGAUCAGAAUACA
	AAAUUUGGAUCGUCACAUG
Ddi2	CAAGAACGGAUUCGUCUGU
	GCAGAAAGGUGUAACAUAA
	GGACAUACGGCCAGAGGAA
	AGAAUUAGCAGAAGCCAUU
Dnaja2	GGGAAUGAUUUGCAUAUGA
	CGUGAAGCCUAUAAUGAUA
	GUCAGAUUGUGGUGAAAUA
	GGUCGAGGUGUGCGCAUUA
Dnajc17	GCAAUGCCAUAGUGGAGUU
	UCAAAGGGCUCAGUGCUGU
	GAGAAGAGGGUUCCCGUCA
	GCAGGAGAUUGCUCGACUU
E2f7	GCAUCUAUGACAUCGUAAA
	AGAAUAAGGAGGAUGCGUU
	CGUCAGUCUCGGCGUGGAA
	CAGUAAAGCCGGUCGACAG
Elk1	CGAAGCAGCCGGAAUGAAU
	GCUCGGGCCUCUAUUCUAC
	GAACUUCCACUUAGCCCAA
	UGUCAAAGCUGAACCAGAA
Ep300	GGACUACCCUAUCAAGUAA
	CGAGAGUACUGAUGUAACA
	CGGCAUGCAUGUUCAAGAA
	CAAGAGCCCUGGCAAUAUA
Ewsr1	GGAGAGAACCGGAGCUUGA
	CGAAAGAAGCCUCCAAUGA
	CUUCACAGCCGACUAGUUA
	GACAACCCAUGAUCCAUAU
Fbxo5	CAAAUCAAGUCCUCCAGUC
	GCAUGGACUUAGUAAAUCU
	GAGAGGAUAUGUUGUGGGC
	CCUAAAGUGGAUCGAGAAA
Fli1	GGAGUGGGCUAUAAAGGAA
	UAUAAUAGCUACAUGGAUG
	GUUCACUGCUGGCCUAUAA
	GGACGGGACUAUUAAGGAG
Hcfc1	GAGAAGGAGUGGAAGUGUA

	AGAACAACAUUCCGAGGUA
	UGAAGUAGACCAGUUAUCA
	CCGGCAAGAUCAUCGAGUA
Hectd1	GGAAGGGACUGCUUAUAUA
	GUAGGGAACUGGUCAUUAA
	GAAGGUGGAUCGGAUAGUU
	GGAGAAAUUGCUAUUCAUA
Hsf1	GCUAAGUGAUCACCUGGAU
	CAAGUAUGGUCGACAGUAC
	AGAACGAGCUAAGUGAUCA
	UGCGGCAGCUCAACAUGUA
Hsp90aa1	GAGCUUAACUAACGAUUGG
	GGAAUUAAUCCCUGAGUAU
	GAACCAAUGGGUCGUGGAA
	CAUCGGACGCUCUGGAUAA
Hsp90ab1	CAUCAACACUUUCUAUUCA
	GAAACAUUCGCAGUUCAUA
	UGACUGAGCCUAUUGACGA
	GAUAUGAGAGCCUGACGGA
Hspa1a	GAUCGCCGGUCUAAACGUG
	CAUCAUCAGUGGGCUGUAC
	GCGACAAGCCCAAGGUGCA
	GCUACAAGGCCGAGGACGA
Hspa2	ACAAUAACCUCUUGGGCAA
	CCACAGUGCAGUCCGAUAU
	GCUGCGCGAUGCCAAGCUA
	GCGAACGGGCCAUGACCAA
Hspa4	GCAAGUUUAUGUAGACAAA
	GACGAUCGCUAACGAGUAU
	GUAAAGAACUCAGCACAAC
	GGGCAUAAAGGUUACAUAU
Hspa8	CGAUGAAGCUGUUGCCUAU
	CAAGAGAGCUGUCCGCCGU
	AGUCACAGAUCCAUGAUAU
	UUGCUGAGUUCAAGCGAAA
Hspb1	GGAGAUCACUGGCAAGCAC
	CCAAAGCAGUCACGCAGUC
	GGAGAUCACCAUUCCGGUU
	CCUCUUCGAUCAAGCUUUC
Ipo11	GAUAAUGUGUGUCGAGAUA
	CACCAGAGCUGCUUCGUAU
	CGAUUAGUCUCUCAUUAUU
	GGACACGAGUUUAAUCAGG
Kat2a	AGAAAGAGAUCAUCAAGAA
	CCAUGGAGCUGGUCAAUGA
	GGACUCAGCUGCUUCAAAG
	GGAUGUCGCUACCUACAAA

Kat2b	GCAGUAACCUCAAAUGAAC
	UCACAUAUGCAGAUGAGUA
	GAAGAACCAUCCAAAUGCU
	AAACAAGCCCAGAUUCGAA
Klf4	GAGGAACUCUCUCACAUGA
	GACCUAGACUUUAUCCUUU
	GGUCAUCAGUGUUAGCAAA
	CACCUUGCCUUACACAUGA
Kmt2a	CGGCAAAUGGAGCGAGUUU
	CCACCAAACCCACGAAGAA
	AGACAAAGCCCUCGAAGGA
	GCACAGUGGUCUCACGAUU
Nfe2l1 (Nrf1)	GAAGAUCCCAUUCACCAAU
	GAGGACUUGCAGCGAGAUA
	CAGUAGGGAUAGAAAGCGU
	CAUCCUAAACCUAGAACGU
Pbrm1	CAACAUGAGUGGCUACAUU
	GAGAGCCGCUAUAAUGAGA
	CAUUGAAGCUCCAUCUCUA
	GGGAUUUAAUGCUUCGAGA
Phip	UAGCAAGUAUGACAAGAUA
	GAGUCAAAGUUCGAUCUUA
	UAUCAUCGGUGUACUGUGU
	UGAGAAUGGCCUAACGUUA
Pign	GGAAUGUUAUAAUGCAUGA
	CAUUUAAGUUGCUUUCUGA
	GCACAAUUGCUCACAACAA
	GGACAUGCUCAUCGACCAU
Plk1	CAACACGCCUGAUUCUCUA
	UCACUCUCCUCAACUAUUU
	GCAAGAUCGUGCCUAAGUC
	CAGCGACUUUGUAUUUGUA
Rbx1	CAAGAAGCGCUUUGAAGUU
	GGAACCACAUUAUGGAUCU
	GGGACAUUGUGGUUGAUAA
	GUAUCGAAUGUCAGGCCAA
Rpn1	GUACAUUACGAGAACAAUA
	CAACCUAGAAGUACGAGAA
	CAUUAUACCUACCUAGACA
	CACCUAGGCGUGCAGAUAA
RUVBL1	GCCAUUGGGUUGCGGAUAA
	AGACUAAGGAGGUUUAUGA
	CUCAGGAGCUGGGCAGUAA
	GAUCAUAGGGCUCAAGACU
Smarca2	GGAGAAAGACGUCAUGCUU
	AGACUUACCAGAAUACUAU
	GAGGAGGUACGGCUUAAGA

	CCAAACCCGUCGUGAGCGA
Smarca4	GGUCAACGGUGUCCUCAAA
	GAUAAUGGCCUACAAGAUG
	GAGCGAAUGCGGAGGCUUA
	CAACGGGCCUUUCCUCAUC
Sp100	GAAGGAAACUCCACGAAAC
	GGGCAAGACAGGGCGGUUA
	UCUAAUGCGAUAAGAAGUA
	CGAGGAUACAAGCGAGCAA
Sp110	GGAAAUGGCCAGGGAAGUA
	CCACACAAGUUCCAGAGAA
	GAAGCGCUCCGGGACAAUU
	AGACUGGAAGGGCGUUAUA
Sp140	GUGCCGGGAUGGAGGAUUA
	GUAUUCAGAACUCAGAUAA
	CAAUGAGUGUACAGAGAAA
	GAGACAAGAAGCAGGAGCA
Sqstm1	GCAUUGAGGUUGACAUUGA
	GAACAGAUGGAGUCGGGAA
	GGCUAUGUCCUAUGUGAAA
	CGCUAUAAGUGCAGUGUGU
Ssrp1	GAUGGGAGGCUUCGAUUGA
	GCGAAUCGGAGUUUGAGAA
	CCAAACUCGUUACCACUUC
	GCGUACAUGCUGUGGCUUA
Taf1	CAACAGAGGUCUUAUCAAC
	GGAUACGGAUGGAAGAUAU
	GAGAGUCAGUAUACUAAGA
	GAGGAUAAGUUGGCACGUU
Trim24	GCAAGCGGCUGAUUACAUA
	GAUCAGCCUAGCUCAGUUA
	CCAAUACGUUCACCUAGUG
	AAACUGACCUGUCGAGACU
Trim28	CUAAGAAGCUGAUCUAUUU
	GGACAAACAUGCCACACUU
	CAAGAGUGCUGAAGCCUUU
	GAACCAACGUAAACUCUUG
Trim33	CAACUAACCUUCACCUAGA
	GAACAUAGGUAUCAGUUUU
	CGAGAGACCAGUACAUAUA
	CCUCUAUUGUCACGAAUUA
Trim66	GAGGAGACCCUGCAGGUUA
	GGACGUAUCUGGCGAGAGU
	GAGAGAUGCCUGUGUUUAA
	CAUAAGAAAUCCAGCCUAC
Tsc1	ACACGUUGGUUGAUUAUUA
	CGGGAGCUGUUCCGUAAUA

	GUCAAACGACCGAGGAUUA
	UCACAUCCGUAUAGUAAAG
Uba3	GAUCCAAGCUCCAUUGUAC
	GGGAAUGCCCGAGUGAUUU
	CGAACCAGGCCCAAUCUUU
	CAUGUAAAGUUCUAGUCAU
Ube2m	GGAUUCAGAAGGACAUUAA
	GAAGCCAGUCCUUACGAUA
	GUAUUCAGCUUUAAGGUGG
	ACAUUGACCUCGAGGGCAA
Ubxn11	GAACAGGCUUCCCAAGUGU
	GAGACUGGAUGAAGGCCAA
	GGGAUAAGAGUCUACGGAA
	CGACGUGCGGAAACUCUUA
Usp44	GCGGAAGAGUUUACGCUUA
	GAAUAGAUUUCUUUCACGA
	GAUAAGAUACAACGUGAAC
	GGUACUGUAUGGUCUGCAA
Usp46	AGAACGAUCUCUUUGAUAA
	GGUCUAACGUCAGAUAUAU
	AAUAGACGCUCAAGCCAUU
	GGAACACUCACUAACGAAA
Usp9x	CGUAAUGUAUGCCAAUUUA
	GAAUUUAGCUUCGCGGGUU
	GAAUGUACAUGAUCUACUG
	CUAACGAUCUCAUUUACAA
Vcp (p97)	GUAGAGGUGCCACAAGUAA
	UGAAUAGAGUUGUUCGGAA
	UAAAGUAUGGCAAACGUAU
	ACGAUGACCUGUAUGGCUA
Zmynd11	GCACGGAUGUUAUAUAAAG
	GCAAAGAAAGGACGACGUA
	GGAGCGGGCUAUAGACCUU
	GCAUGUGCCACGACAAGUA
Zmynd8	CGAGAUGAAUGAAAUCGAA
	GGACAAAGACGGGCAGGUU
	GAUGGAAGUUUACGUGGAG
	AAACCCGGCUUACUCAACA

Table S3. siRNA sequences for the genes targeted in experiments other than the RNAi screen

Gene	siRNA sequences
Mouse RUVBL1	GCCAUUGGGUUGCGGAUAA
	AGACUAAGGAGGUUUAUGA
	CUCAGGAGCUGGGCAGUAA
	GAUCAUAGGGCUCAAGACU
Mouse RUVBL2	GAAGACAGCCAUUGCCAUG
	CACAGUACAUGAAGGAGUA
	GCUCAAAGGCGAAACAAUG
	UGACAAGAAUCGAGCGAAU
Mouse TIP60	UGAGAUUGAUGGACGGAAA
	GGACAUCAGUGGCCGAAAG
	UCUACGUAAUGACGGAGUA
	CCUGGACGGAAGCGGAAAU
Mouse INO80	CGAACAAGGUCAUUUGAUG
	UGAACUGGUUAGCAAAUUU
	GAAUCAACUCUCUCGUUUA
	GCAGCUGCCCUUUGUUAAA
Mouse SRCAP	CCGCAUACUGUUAGAGAUA
	CGUAAGAACUGGCGGUAUC
	CGAAAGGCCAAGACGUGAA
	GCUUAUCAGUGAACGGACA
Mouse PIH1	GGAGAGAACCGCCUGGUGA
	GAACAGUGAUUUCUUGCGG
	GAAGAGACGGUGCGGUUUC
	AGUAUGGCCUACAGCUAAA
Human RUVBL1	GCAGAAAGAGCGAGUAGAA
	CAAAGGAACCAAACAGUUG
	GCCAUUGGGCUGCGAAUAA
	AGAGGCAUGUGGCGUCAUA
Human RUVBL2	UAACAAGGAUUGAGCGAAU
	CGCAGUACAUGAAGGAGUA
	UCAACGAACUCAAAGGCGA
	ACGCAAGGGUACAGAAGUG
Human TIP60	GGACAGCUCUGAUGGAAUA
	CACAGGAACUCACCACAUU
	GAACAAGAGUUAUUCCCAG
	CCACAGAUCACCAUCAAUG

Table S4. Primers used in quantitative RT-PCR (qRT-PCR) and chromatin immunoprecipitation (ChIP)-qPCR assays

Experiment	Gene	Forward Primer (5'-3')	Reverse Primer (5'-3')
qRT-PCR	Human RUVBL1	TTGCTCAGGAGCTGGGTAGT	CCCATGGGATTCTCTGTCTC
	Human TIP60	ATCCTGAGCGTGAAGGACAT	TCTCTCTGGAGAGCCAGGAC
	Human PSMA7	CTGTGCTTTGGATGACAACG	CGATGTAGCGGGTGATGTACT
	Human PSMB7	TGCAAAGAGGGGATACAAGC	GCAACAACCATCCCTTCAGT
	Human PSMC4	GGAAGACCATGTTGGCAAAG	AAGATGATGGCAGGTGCATT
	Human PSMD12	GTGCGCGACTGACTAAAACA	TAGGCAGAGCCTCATTTGCT
	Human 18S rRNA	ATGGCCGTTCTTAGTTGGTG	CGCTGAGCCAGTCAGTGTAG
	Mouse RUVBL1	GAGAGCGGCCTAGCCAAG	TCTCCATCAGCACCTCTGTC
	Mouse TIP60	GATGAATGGGTGACTCACGA	TTGAAGCGGAGTGTGATCTG
	Mouse INO80	TTTCTGCGACAAACATCAGC	ACAACCCAGAACTGCTTGCT
	Mouse SRCAP	CAGATTCTAGTGGGGCAGGA	TTCATGTTTGGCTTGCTCTG
	Mouse PIH1	GACCAACTCATCGGAAGGAA	CAGCGACGTCATAGGCAGTA
	Mouse PSMA7	AACGTCTGTATGGCCTTTGC	GTCACTGGGTCCTCCACTGT
	Mouse PSMB7	CTGTCTTGGAAGCGGATTTC	GCAACAACCATCCCTTCAGT
	Mouse PSMC4	TGGTCATCGGTCAGTTCTTG	CGGTCGATGGTACTCAGGAT
	Mouse PSMD12	TCACAGACCTGCCAGTCAAG	AGGTTTTAGTCAGCCGAGCA
	Mouse 18S rRNA	CGCGGTTCTATTTTGTTGGT	AGTCGGCATCGTTTATGGTC
ChIP-qPCR	Mouse PSMA7	CGGTAGCCGGTACACCGCC	ACTTGGAAGAGGTGGCCGTC
	Mouse PSMB7	GTGTCCAAGACAAAGGATGAG	GACTGGGAACCTCGAGGAGA
	Mouse PSMD12	GCCCATTCTTGGGCCTGCC	ATCGGCCCGCTCCGAGCCA