

Supplementary Figure 1. Source gel images

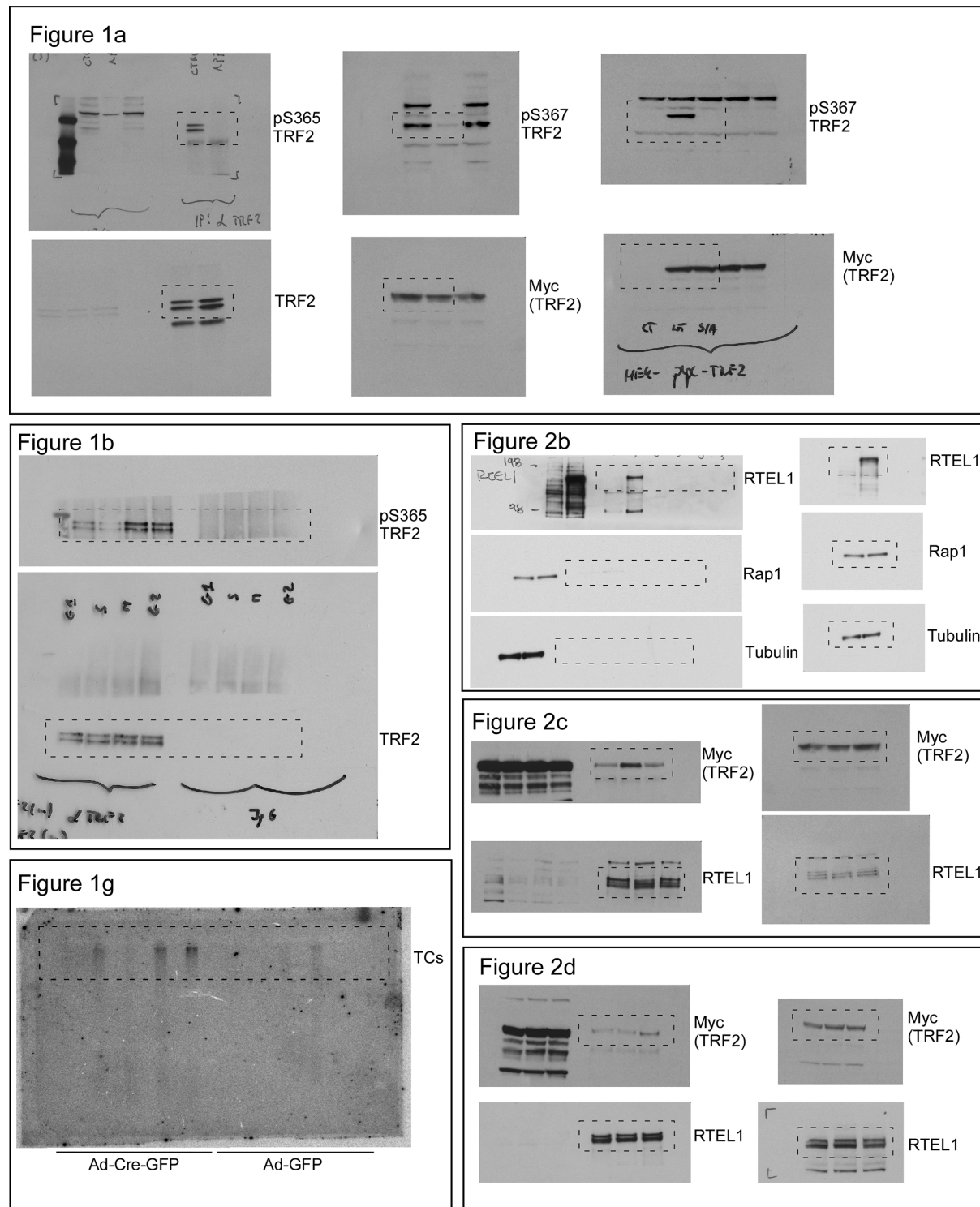


Figure 2e

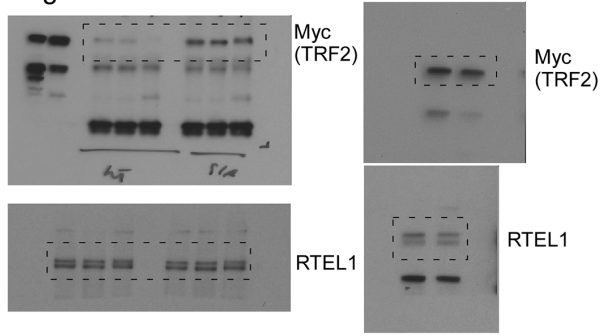


Figure 2h

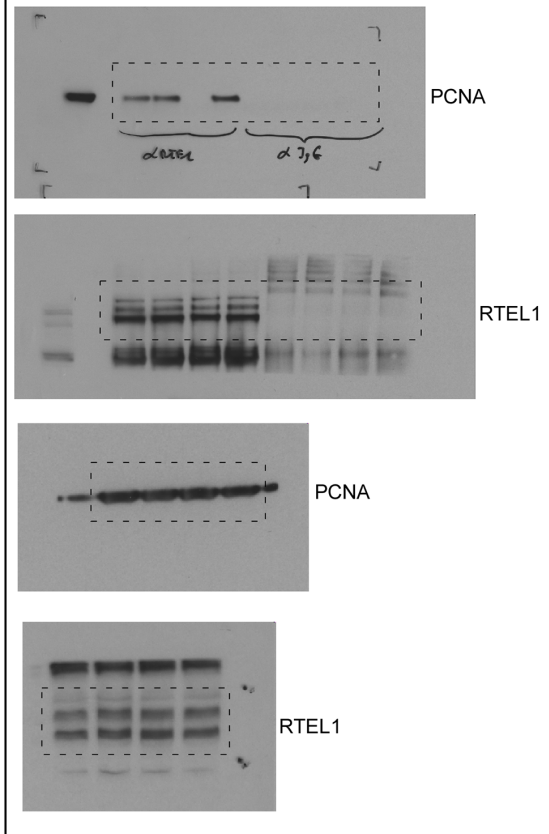


Figure 2f

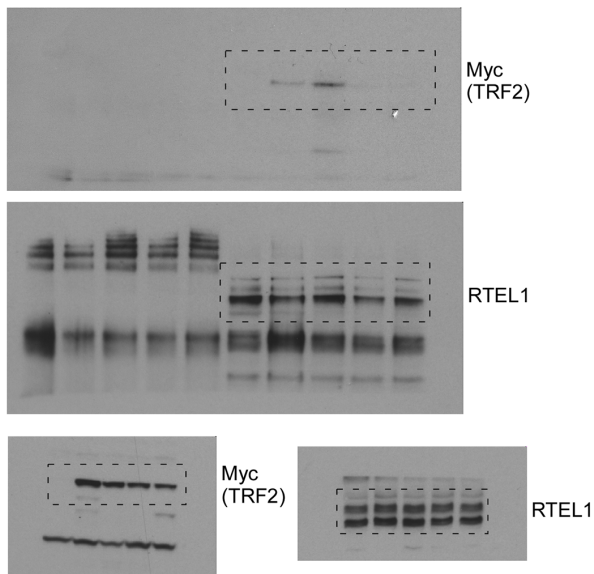


Figure 4a

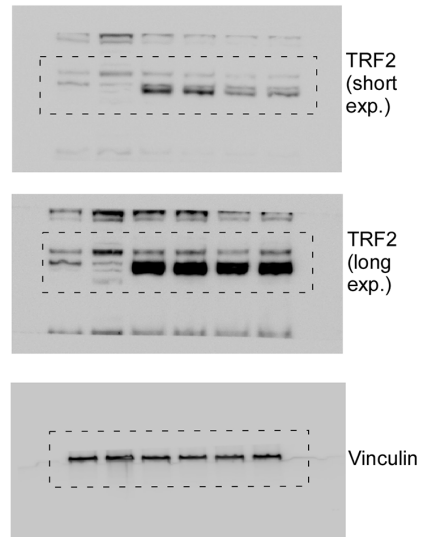
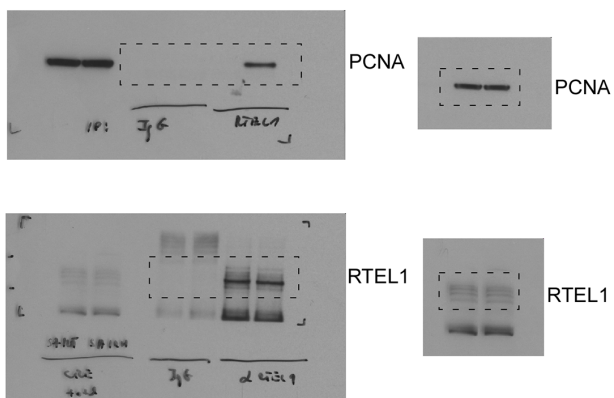
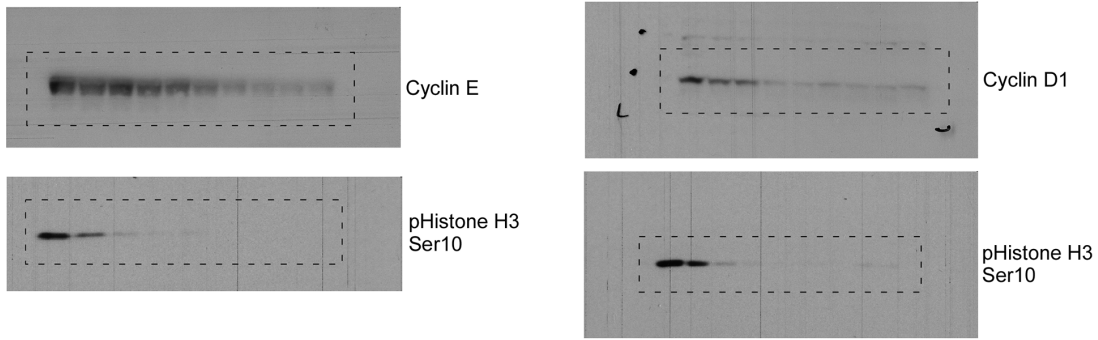


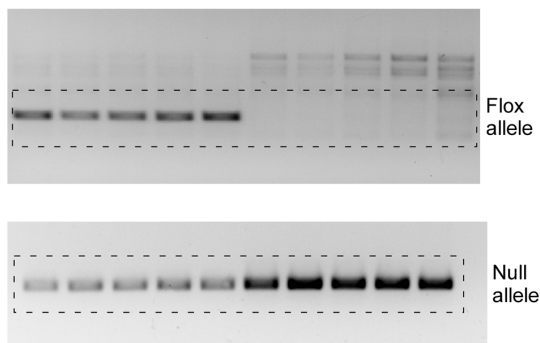
Figure 3b



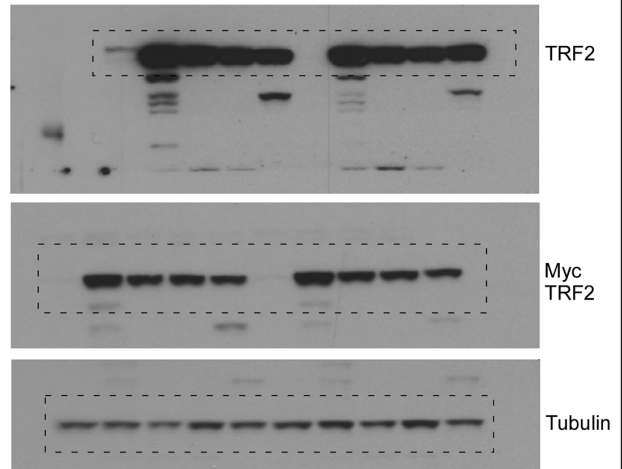
Extended data fig. 1b



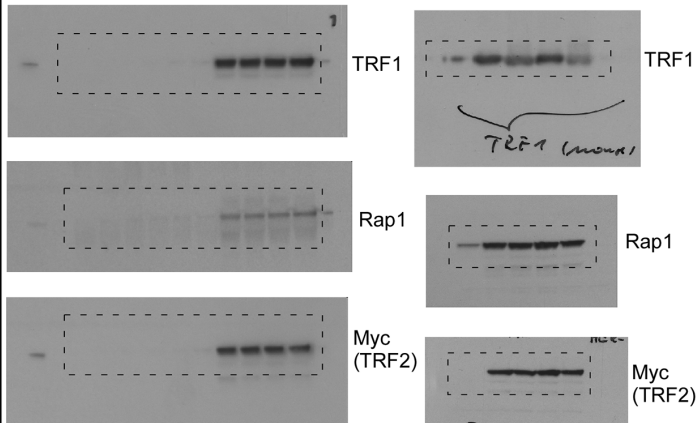
Extended data fig. 1c



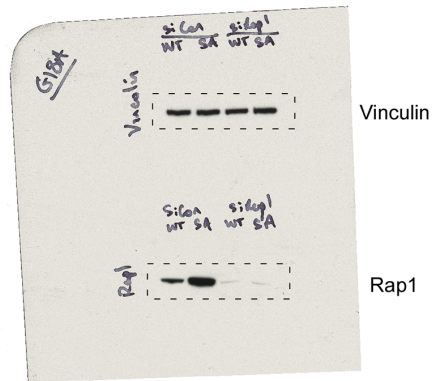
Extended data fig. 1d



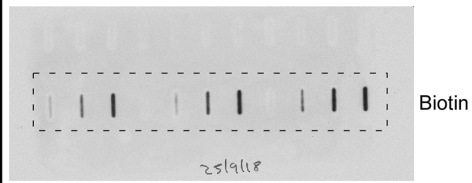
Extended data fig. 2a



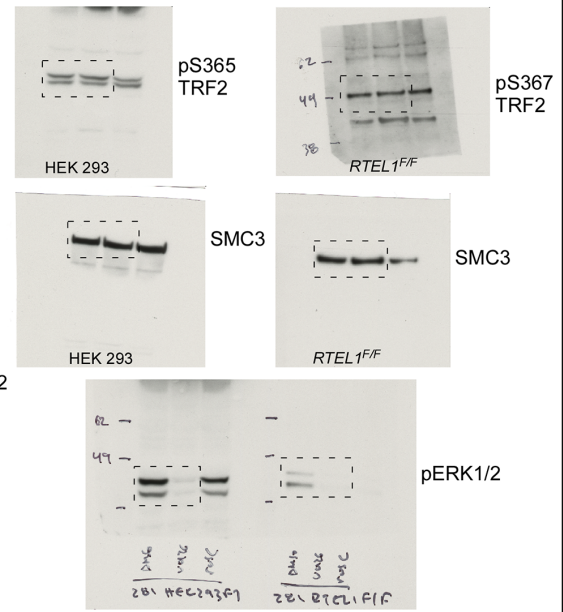
Extended data fig. 2b



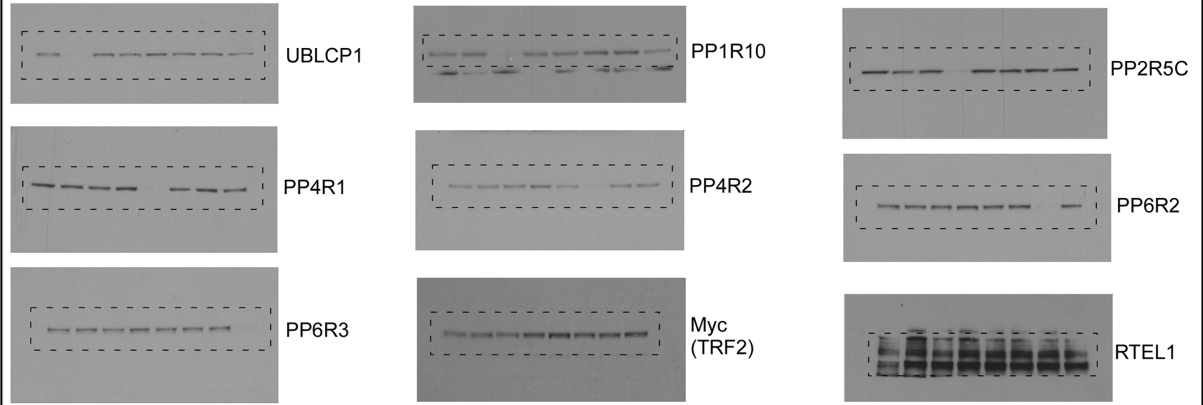
Extended data fig. 3a



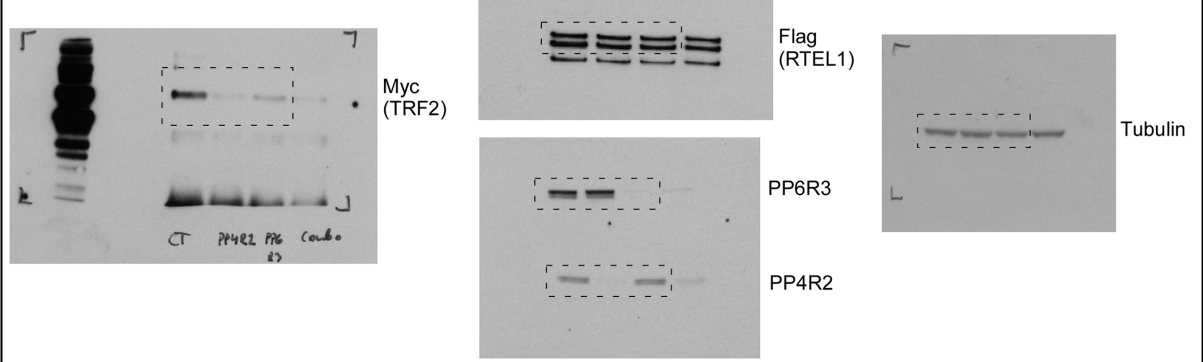
Extended data fig. 3b



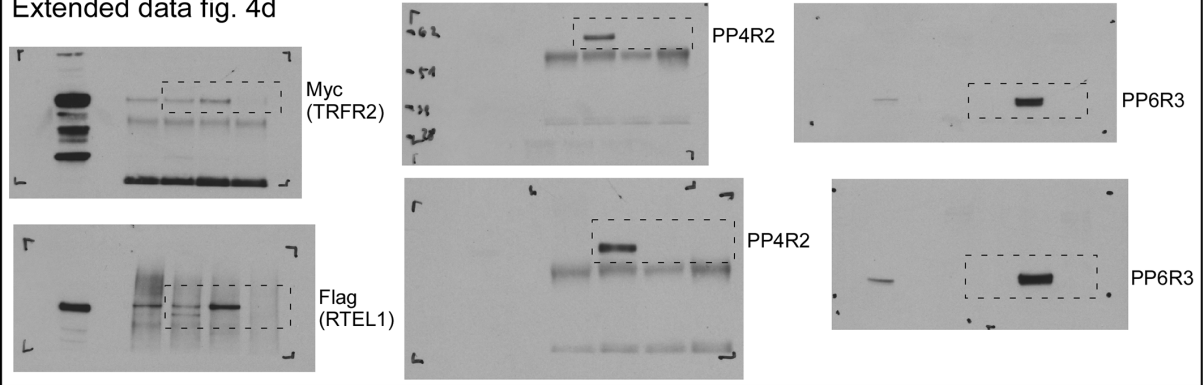
Extended data fig. 4b



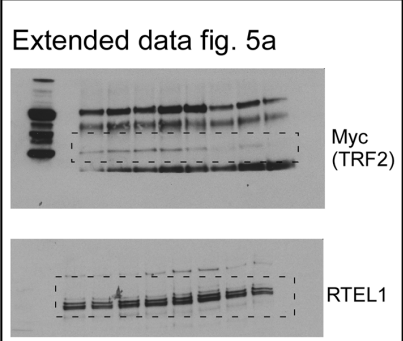
Extended data fig. 4c



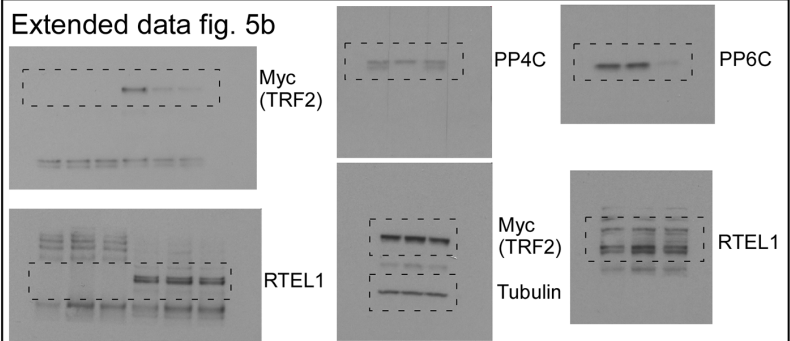
Extended data fig. 4d



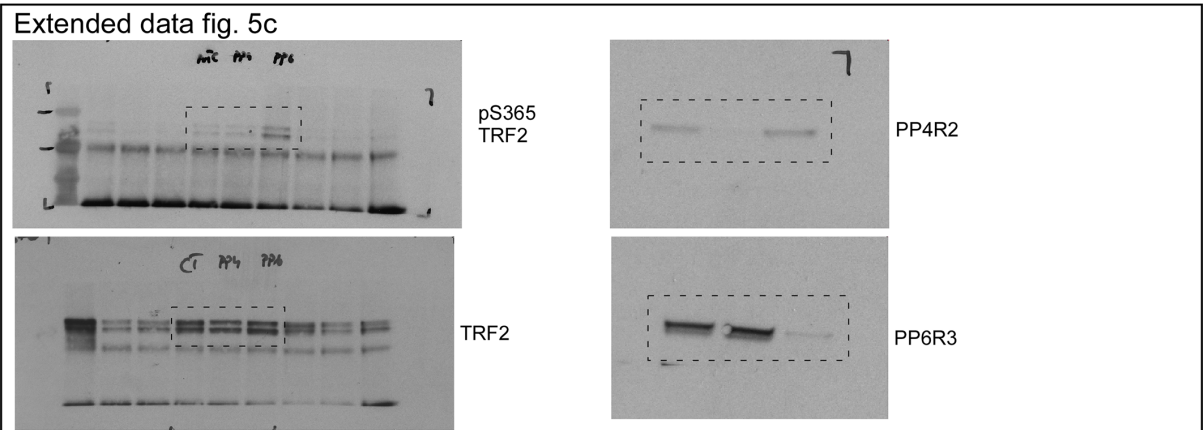
Extended data fig. 5a



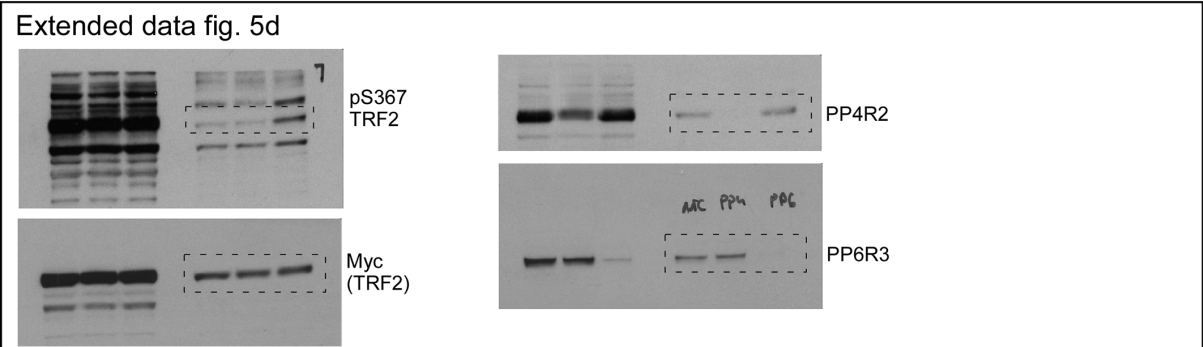
Extended data fig. 5b



Extended data fig. 5c



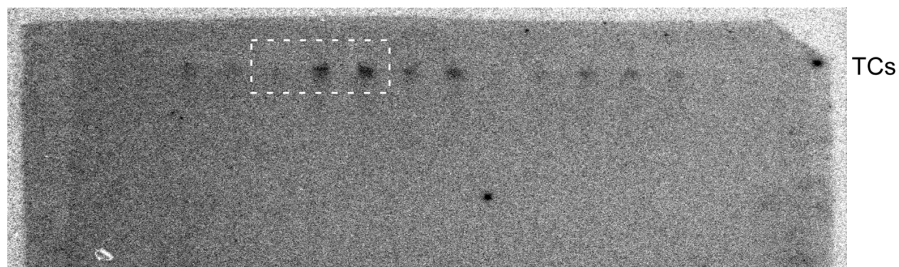
Extended data fig. 5d



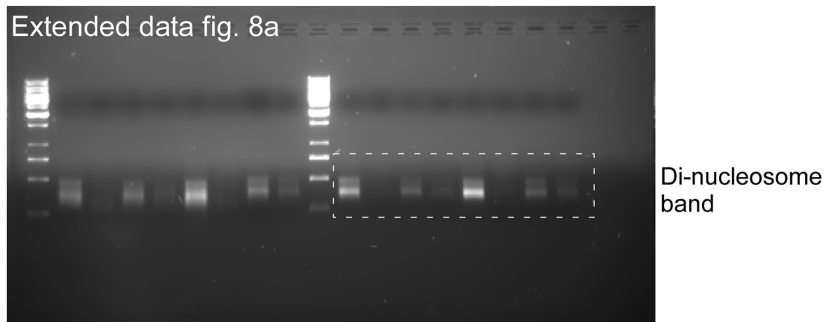
Extended data fig. 5e



Extended data fig. 5f



Extended data fig. 8a



Supplementary Table 1. List of antibodies used in the paper

Donkey Anti-Rabbit IgG (H+L) Antibody, Alexa Fluor488 Conjugated	Thermo Fisher	Cat# A-21206
Goat Anti-Rat IgG (H+L) Antibody, Alexa Fluor594 Conjugated	Thermo Fisher	Cat# A-11007
Mouse Anti-BrdU Monoclonal Antibody, FITC Conjugated, Clone B44	BD Biosciences	Cat# 347583
Mouse monoclonal anti-53BP1	BD Bioscience	Cat# 612523
Mouse monoclonal anti-ERK1/2 (C-9)	Santa Cruz	Cat# sc-514302
Mouse monoclonal anti-Myc	Abcam	Cat# ab-32
Mouse Monoclonal anti-PCNA	Santa Cruz Biotechnology	Cat# sc-56
Mouse monoclonal anti-TRF1	Abcam	Cat# ab-10579
Mouse Monoclonal anti-Tubulin	Sigma-Aldrich	Cat# T6074
Mouse monoclonal anti-Vinculin	Sigma	Cat# V9131
Mouse monoclonal anti- γ H2AX	Millipore	Cat# 05-636
Peroxidase-conjugated Goat anti-Mouse IgG (H+L)	Thermo Fisher Scientific	Cat# G-21040;
Peroxidase-conjugated Goat anti-Rabbit IgG (H+L)	Thermo Fisher Scientific	Cat# G-21234
Peroxidase-conjugated Polyclonal Goat Anti-Rabbit Immunoglobulins	Dako	Cat#P0448
Peroxidase-conjugated Polyclonal Goat Anti-Rabbit Immunoglobulins	Dako	Cat#P0447
Rabbit Anti-Mouse IgG (H+L) Antibody, Alexa Fluor488 Conjugated	Thermo Fisher	Cat# A-11059
Rabbit monoclonal anti-Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204)	Cell Signaling	Cat# 4370
Rabbit monoclonal anti-TRF2	Cell Signaling Technology	Cat# 13136
Rabbit polyclonal anti-53BP1	Novus Biologicals	Cat# NB100-304
Rabbit polyclonal anti-Cyclin D1	Cell Signaling Technology	Cat# 2922
Rabbit polyclonal anti-Cyclin E	Santa Cruz Biotechnology	Cat# sc-247
Rabbit polyclonal anti-HA	Abcam	Cat# ab-9110
Rabbit polyclonal anti-Myc	Sigma	Cat# c-3956
Rabbit polyclonal anti-Phospho Histone H3 (Ser10)	Cell Signaling Technology	Cat# 9701
Rabbit polyclonal anti-PP1R10	Abcam	Cat# ab-134291
Rabbit polyclonal anti-PP2R5C	Abcam	Cat# ab-94633
Rabbit polyclonal anti-PP4C	Abcam	Cat# ab-16475
Rabbit polyclonal anti-PP4R1	Abcam	Cat# ab-70624
Rabbit polyclonal anti-PP4R2	Abcam	Cat# ab-70631
Rabbit polyclonal anti-PP6C	Abcam	Cat# ab-131335
Rabbit polyclonal anti-PP6R2	Abcam	Cat# ab-72032
Rabbit polyclonal anti-PP6R3	Millipore	Cat# 071381
Rabbit polyclonal anti-PP6R3	Bethyl	Cat# A300-971A
Rabbit polyclonal anti-PP6R3	Aviva Systems	Cat# ARP62362_P050
Rabbit polyclonal anti-Rap1	Bethyl	Cat# A300-306A
Rabbit polyclonal anti-RTEL1	Novus Biologicals	Cat# NBP2-22360

Rabbit polyclonal anti-SMC3	Abcam	Cat# ab-9263
Rabbit polyclonal anti-TRF1	Abcam	Cat# ab-1423
Rabbit polyclonal anti-TRF2	Cell Signaling Technology	Cat# 2645
Rabbit polyclonal anti-TRF2	Novus Biologicals	Cat# NB100-56694
Rabbit polyclonal anti-TRF2	Millipore	Cat# 05-521
Rabbit polyclonal anti-TRF2	Santa Cruz Biotechnology	Cat# sc-9143
Rabbit polyclonal anti-TRF2	Novus Biologicals	Cat# NB110-57130
Rabbit polyclonal anti-UBLCP1	Novus Biologicals	Cat# NBP1-85468
Rabbit polyclonal recognizing human Phospho TRF2 (Ser365)	This paper	N/A
Rabbit polyclonal recognizing mouse Phospho TRF2 (Ser367)	This paper	N/A
Rat polyclonal anti-BrdU	Santa Cruz Biotechnology	Cat# sc-56258

Supplementary Table 2. List of oligonucleotides used in the paper

Amino acid substitution mutant RTEL1R1237H	Sigma-Aldrich	5'cctgtgacttctaccactgttgggctgttg3' 5'caacaggcccaacagtggtagaagtccacagg3'
Amino acid substitution mutant TRF2S367A	Sigma-Aldrich	5'gtttgtgggctggctgatggggatgccag3' 5'ctggcatcccatcagcaccagccacaaac3'
Amino acid substitution mutant TRF2S367D	Sigma-Aldrich	5'tgtttgtgggctggatctgatggggatgccagattagc aagtac3' 5'gtacttgctaactctggcatcccatcagatccagccca caaaca3'
Amino acid substitution mutant TRF2S367E	Sigma-Aldrich	5'tgtttgtgggctggctctgatggggatgccagattagc aagtac3' 5'gtacttgctaactctggcatcccatcagagccagccc acaaaca3'
Non-targeting Pool Accel	Dharmacon	Cat# D-001910-10-05
Non-targeting Pool ON-TARGETplus	Dharmacon	Cat# D-001810-10-05
SMARTpool: Accell Ppp4r2 (mouse) siRNA	Dharmacon	Cat# E-056976-00-0010
SMARTpool: Accell Ppp6r3 (mouse) siRNA	Dharmacon	Cat# E-040027-00-0010
SMARTpool: ON-TARGETplus PPP1R10 (human) siRNA	Dharmacon	Cat# L-011358-00-0010
SMARTpool: ON-TARGETplus PPP4C (human) siRNA	Dharmacon	Cat# L-008486-00-0010
SMARTpool: ON-TARGETplus PPP4R1 (human) siRNA	Dharmacon	Cat# L-019912-00-0010
SMARTpool: ON-TARGETplus PPP4R2 (human) siRNA	Dharmacon	Cat# L-017750-00-0010
SMARTpool: ON-TARGETplus PPP6C (human) siRNA	Dharmacon	Cat# L-009935-00-0010
SMARTpool: ON-TARGETplus PPP6R2 (human) siRNA	Dharmacon	Cat# L-021331-01-0010
SMARTpool: ON-TARGETplus PPP6R3 (human) siRNA	Dharmacon	Cat# L-014646-01-0010
SMARTpool: ON-TARGETplus Terf2ip (mouse) siRNA	Dharmacon	Cat# L-050184-01-0005
SMARTpool: ON-TARGETplus UBLCP1 (human) siRNA	Dharmacon	Cat# L-016328-02-0010