**Table S1. *Saccharomyces cerevisiae* strains used in this study**

|  |  |  |
| --- | --- | --- |
| **Strain** | **Relevant genotype** | **Source** |
| K699 | W303 *MATa ade2-1 can1-100 his3-11,15 leu2-3,112 trp1-1 ura3-1 rad5-535* | Baldo et al., 2008 |
| YLL3854 | W303 *MATa/α est2∆::KANMX4/EST2 tel1∆::HIS3/TEL1* | This study |
| YLL3855 | W303 *MATa/α est2∆::KANMX4/EST2*  *TEL1-hy184::LEU2/TEL1* | This study |
| YLL3905 | W303 *MATa/α est2∆::HPHMX/EST2 rad9∆::URA3/RAD9*  *TEL1-hy184::LEU2/TEL1* | This study |
| YLL3881 | W303 *MATa/α est2∆::HPHMX/EST2 mec1∆::HIS3/MEC1 sml1∆::KANMX4/SML1 TEL1-hy184::LEU2/TEL1* | This study |
| YLL4016 | W303 *MATa/α tlc1∆::KANMX4/TLC1 rad9∆::URA3/RAD9 TEL1-hy184::LEU2/TEL1* | This study |
| YLL3920 | W303 *MATa/α tlc1∆::HPHMX/TLC1 mec1∆::HIS3/MEC1 sml1∆::KANMX4/sml1∆::KANMX4*  *TEL1-hy184::LEU2/TEL1* | This study |
| YLL4039 | W303 *MATa/α est2∆::HPHMX/EST2 exo1∆::HIS3/EXO1 TEL1-hy184::LEU2/TEL1* | This study |
| YLL3918 | W303 *MATa/α est2∆::KANMX4/EST2 rif2∆::HIS3/RIF2 TEL1-hy184::LEU2/TEL1* | This study |
| YLL3988 | W303 *MATa/α est2∆::KANMX4/EST2 tel1-kd::LEU2/TEL1* | This study |
| YLL4142 | W303 *MATa/α TEL1-hy184-3N::KANMX4/TEL1 est2∆::HPHMX/EST2* | This study |
| YLL4141 | W303 *MATa/α TEL1-hy184-2C::KANMX4/TEL1 est2∆::HPHMX/EST2* | This study |
| YLL-D664 | W303 *MATa/α est2∆::KANMX4/EST2 exo1∆::HIS3/EXO1*  *sgs1-D644Δ::TRP/SGS1 TEL1-hy184::LEU2/TEL1* | This study |
| YLL490 | W303 *MATa mec1Δ::HIS3 sml1Δ::KANMX4* | This study |
| DMP5653/15C | W303 *MATa rad9∆::URA3* | Menin et al., 2018 |
| K699 *tel1∆* | W303 *MATa* *tel1∆::HIS3* | Menin et al., 2018 |
| *TEL1-hy184*/6C | W303 *MATa TEL1-hy184::LEU2* | Baldo et al., 2008 |
| DMP6901/4A | W303 *MATa TEL1-hy184::LEU2 rad9∆::URA3* | This study |
| DMP2045/4A | W303 *MATa cdc13-1* | Cesena et al., 2017 |
| DMP6516/2C | W303 *MATa TEL1-hy184::LEU2 cdc13-1* | This study |
| DMP6736/1D | W303 *MATa TEL1-hy184::LEU2 mec1∆::HIS3 sml1∆::KANMX4* | This study |
| YLL3930 | W303 *MATa TEL1-hy184-2C::LEU2 mec1∆::HIS3 sml1∆::KANMX4* | This study |
| YLL3936 | W303 *MATa TEL1-hy184-3N::LEU2 mec1∆::HIS3 sml1∆::KANMX4* | This study |
| YLL1139 | W303 *MATa MRE11-18MYC::TRP1* | Viscardi et al., 2007 |
| DMP6972/1C | W303 *MATa MRE11-18MYC::TRP1*  *TEL1-hy184-3N::LEU2* | This study |
| UCC5913 | *MATa-inc ade2-101 lys2-801 his3-Δ200 trp1-Δ63 ura3-52 leu2-Δ1::GAL1-HO-LEU2 VII-L::ADE2-TG(1-3)-HO site-LYS2* | Diede and Gottschling, 1999 |
| YLL2599 | *UCC5913 MATa bar1Δ::HPHMX* | This study |
| YLL3969 | *UCC5913 MATa bar1Δ::HPHMX TEL1-hy184::KANMX4* | This study |
| YLL2820 | *UCC5913 MATa bar1Δ::HPHMX tel1∆::HIS3* | This study |
| YLL4060 | *UCC5913 MATa bar1Δ::HPHMX tel1-kd::KANMX4* | This study |
| YLL3068 | *UCC5913 MATa bar1Δ::HPHMX TEL1-3HA::NATMX* | This study |
| YLL3970 | *UCC5913 MATa bar1Δ::HPHMX TEL1-3HA::NATMX-hy184::KANMX4* | This study |
| YLL4128 | *UCC5913 MATa bar1Δ::HPHMX TEL1-3HA::NATMX-hy184-3N:KANMX4* | This study |
| YLL4126 | *UCC5913 MATa bar1Δ::HPHMX TEL1-3HA::NATMX-hy184-2C:KANMX4* | This study |

Baldo, V., V. Testoni, G. Lucchini, and M. P. Longhese, 2008 Dominant *TEL1-hy* mutations compensate for Mec1 lack of functions in the DNA damage response. Mol Cell Biol. 28: 358-375. https://doi.org/10.1128/MCB.01214-07

Cesena, D., C. Cassani, E. Rizzo, M. Lisby, D. Bonetti, and M.P. Longhese, 2017 Regulation of telomere metabolism by the RNA processing protein Xrn1. Nucleic Acids Res. 45:3860-3874. https://doi.org/10.1093/nar/gkx072.

Diede, S. J., and D. E. Gottschling, 1999 Telomerase-mediated telomere addition in vivo requires DNA primase and DNA polymerases polymerases α and δ. Cell 99: 723–733. http://dx.doi.org/10.1016/S0092-8674(00)81670-0

Menin, L., S. Ursich, C. Trovesi, R. Zellweger, M. Lopes, M.P. Longhese, and M. Clerici, 2018 Tel1/ATM prevents degradation of replication forks that reverse after topoisomerase poisoning. EMBO Rep. 19. pii: e45535. http://dx.doi.org/10.15252/embr.201745535

Viscardi, V., D. Bonetti, H. Cartagena-Lirola, G. Lucchini, and M. P. Longhese, 2007 MRX-dependent DNA Damage Response to Short Telomeres. Mol Biol Cell. 18: 3047–3058. https://doi.org/10.1091/mbc.E07-03-0285