**Table S1. Yeast strains used in this study**

|  |  |  |
| --- | --- | --- |
| **Strain** | **Genotype** | **Source** |
| BY4741 | *MAT***a** *his3∆1 leu2∆O met15∆O ura3∆O* | Open Biosystems |
| TSA131 | *MAT***a** *his3∆1 leu2∆O met15∆O ura3∆O cdc7-4::KanR* | (Tong and Boone 2006) |
| TSA161 | *MAT***a** *his3∆1 leu2∆O met15∆O ura3∆O dbf4-1::KanR* | (Tong and Boone 2006) |
| TSA162 | *MAT***a** *his3∆1 leu2∆O met15∆O ura3∆O dbf4-2::KanR* | (Tong and Boone 2006) |
| RSY299 | *MAT***α** *leu2 trp1 his3 ura3* | (Hoang *et al.* 2007) |
| RSY302 | *MAT***α** *leu2 trp1 his3 ura3 cdc7-7* | (Hoang *et al.* 2007) |
| RSY847 | *MAT***α***leu2 trp1 his3 ura3 cdc7-7 mcm5-P83L (mcm5–bob1-2)* | (Hoang *et al.* 2007) |
| RSY867 | *MAT***α** *leu2 trp1 his3 ura3 mcm5-P83L (mcm5-bob1-2)* | (Hoang *et al.* 2007) |
| YMB9337 | *MAT***α** *leu2 trp1 his3 ura3 CSE4Δ::6HIS-3HA-Cse4::mx4NAT* | This Study |
| YMB9338 | *MAT***α** *leu2 trp1 his3 ura3 cdc7-7 CSE4Δ::6HIS-3HA-Cse4::mx4NAT* | This Study |
| YMB10040 | *MAT***a** *cse4::∆Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112, his3-11, trp1-1, can1-100, ade2-1, bar∆ cdc7-7:KanMX* | This Study |
| YMB10041 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112:pGal-3Flag-Cse4:Leu2, his3-11, trp1-1, can1-100, ade2-1, bar∆ cdc7-7:KanMX* | This Study |
| YMB10043 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112, his3-11, trp1-1, can1-100, ade2-1, bar∆ CDC7:KanMX* | This Study |
| YMB10044 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112:pGal-3Flag-Cse4:Leu2, his3-11, trp1-1, can1-100, ade2-1, bar∆ CDC7:KanMX* | This Study |
| YMB10124 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112, his3-11, trp1-1, can1-100, ade2-1, bar∆ cdc7-7:KanMX psh1∆::hphMX* | This Study |
| YMB10125 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112:pGal-3Flag-Cse4:Leu2, his3-11, trp1-1, can1-100, ade2-1, bar∆ cdc7-7:KanMX psh1∆::hphMX* | This Study |
| YMB10126 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112, his3-11, trp1-1, can1-100, ade2-1, bar∆ CDC7:KanMX psh1∆::hphMX* | This Study |
| YMB10127 | *MAT***a** *cse4∆::Nat, Ura3-1::3Flag-Cse4:Ura, leu2-3,112:pGal-3Flag-Cse4:Leu2, his3-11, trp1-1, can1-100, ade2-1, bar∆ CDC7:KanMX psh1∆::hphMX* | This Study |

**Table S2. Plasmids used in this study**

|  |  |  |
| --- | --- | --- |
| **Name** | **Promoter, Gene and Marker** | **Source** |
| pRS425 | *LEU2* | (Christianson *et al.* 1992) |
| SB878 | *GAL HA-CSE4 LEU2* | Sue Biggins |
| pMB433 | *pRS426 GAL1 URA3* | (Mumberg *et al.* 1994) |
| pMB1058 | *pRS415-MTW1-GFP LEU2/CEN* | (Kerscher *et al.* 2003) |
| pMB1597 | *GAL1 HA-CSE4 URA3* | (Au *et al.* 2008) |
| pMB1604 | *MoBy UBI4 2µ LEU2* | (Ho *et al.* 2009) |
| pMB1722 | *pGEM-T-Easy cdc7-7:KanMX* | This Study |
| pMB1898 | *MoBy CDC7 2µ LEU2* | (Ho *et al.* 2009) |

CITATIONS

Au, W. C., M. J. Crisp, S. Z. DeLuca, O. J. Rando and M. A. Basrai, 2008 Altered dosage and mislocalization of histone H3 and Cse4p lead to chromosome loss in Saccharomyces cerevisiae. Genetics 179**:** 263-275.

Christianson, T. W., R. S. Sikorski, M. Dante, J. H. Shero and P. Hieter, 1992 Multifunctional yeast high-copy-number shuttle vectors. Gene 110**:** 119-122.

Ho, C. H., L. Magtanong, S. L. Barker, D. Gresham, S. Nishimura *et al.*, 2009 A molecular barcoded yeast ORF library enables mode-of-action analysis of bioactive compounds. Nat Biotechnol 27**:** 369-377.

Hoang, M. L., R. P. Leon, L. Pessoa-Brandao, S. Hunt, M. K. Raghuraman *et al.*, 2007 Structural changes in Mcm5 protein bypass Cdc7-Dbf4 function and reduce replication origin efficiency in Saccharomyces cerevisiae. Mol Cell Biol 27**:** 7594-7602.

Kerscher, O., L. B. Crotti and M. A. Basrai, 2003 Recognizing chromosomes in trouble: association of the spindle checkpoint protein Bub3p with altered kinetochores and a unique defective centromere. Mol Cell Biol 23**:** 6406-6418.

Mumberg, D., R. Muller and M. Funk, 1994 Regulatable promoters of Saccharomyces cerevisiae: comparison of transcriptional activity and their use for heterologous expression. Nucleic Acids Res 22**:** 5767-5768.

Tong, A. H., and C. Boone, 2006 Synthetic genetic array analysis in Saccharomyces cerevisiae. Methods Mol Biol 313**:** 171-192.