**Table S1: strains used in this study**

Dash (/) in genotype separates mat a and mat α in diploids: mat a genotype / mat α genotype

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Strain name** | **Genotype** | **Source** |
| 1 | S. cer diploid WT | BY4743 |  |
| 2 | S. par diploid WT | OS142 (Diploid) hoΔ::natNT2 / hoΔ::natNT2 |  |
| 3 | Hybrid | Hybrid hoΔ::kanMX4/OS142 hoΔ::natNT2 |  |
| 4 | S. cer ace2Δ | BY4743 ace2Δ::kanMX4 hoΔ::natNT2/ace2Δ::kanMX4hoΔ::hphNT1 | Krieger et al. 2020 |
| 5 | S. cer swi5Δ | BY4743 swi5Δ::kanMX4 hoΔ::natNT2/swi5Δ::kanMX4hoΔ::hphNT1 |
| 6 | S. par ace2Δ | OS142 ace2Δ::kanMX4 hoΔ::natNT2/ace2Δ::kanMX4hoΔ::hphNT1 |
| 7 | S. par swi5Δ | OS142 swi5Δ::kanMX4 hoΔ::natNT2/swi5Δ::kanMX4hoΔ::hphNT1 |
| 8 | Hybrid ace2Δ | Hybrid ace2Δ::kanMX4 hoΔ::natNT2/ace2Δ::kanMX4hoΔ::hphNT1 |
| 9 | Hybrid swi5Δ | Hybrid swi5Δ::kanMX4 hoΔ::natNT2/swi5Δ::kanMX4hoΔ::hphNT1 |
| 10 | S. cer Ace2-MNase | BY4741 Ace2-Mnase-KanMX4, hoΔ::natNT2 | this study |
| 11 | S. cer Swi5-MNase | BY4741 Swi5-Mnase-KanMX4, hoΔ::natNT2 | this study |
| 12 | S. cer Fkh1-MNase | BY4741 Fkh1-Mnase-KanMX4, hoΔ::natNT2 | this study |
| 13 | S. cer Fkh2-MNase | BY4741 Fkh2-Mnase-KanMX4, hoΔ::natNT2 | this study |
| 14 | S. par Ace2-MNase | OS142 (mat α) Ace2-Mnase-KanMX4, hoΔ::hphNT1 | this study |
| 15 | S. par Swi5-MNase | OS142 (mat α) Swi5-Mnase-KanMX4, hoΔ::hphNT1 | this study |
| 16 | S. par Fkh1-MNase | OS142 (mat α) Fkh1-Mnase-KanMX4, hoΔ::hphNT1 | this study |
| 17 | S. par Fkh2-MNase | OS142 (mat α) Fkh2-Mnase-KanMX4, hoΔ::hphNT1 | this study |
| 18 | S. cer Ace2-Mnase fkh1Δ | BY4741 Ace2-Mnase-KanMX4, hoΔ::natNT2,fkh1Δ::hphNT1 | this study |
| 19 | S. cer Ace2-Mnase fkh2Δ | BY4741 Ace2-Mnase-KanMX4, hoΔ::natNT2,fkh2Δ::hphNT1 | this study |
| 20 | S. cer Ace2-Mnase fkh1Δ fkh2Δ | BY4741 Ace2-Mnase-KanMX4, hoΔ::natNT2,fkh1Δ::hphNT1, fkh2Δ::LEU2 | this study |
| 21 | S. cer Swi5-Mnase fkh1Δ | BY4741 Swi5-Mnase-KanMX4, hoΔ::natNT2,fkh1Δ::hphNT1 | this study |
| 22 | S. cer Swi5-Mnase fkh2Δ | BY4741 Swi5-Mnase-KanMX4, hoΔ::natNT2,fkh2Δ::hphNT1 | this study |
| 23 | S. cer Swi5-Mnase fkh1Δ fkh2Δ | BY4741 Swi5-Mnase-KanMX4, hoΔ::natNT2,fkh1Δ::hphNT1, fkh2Δ::LEU2 | this study |
| 24 | S. cer Ace2-Mnase fkh1Δ S.par Fkh2 | BY4741 Ace2-Mnase-KanMX4 ,fkh1Δ::hphNT1, S. parFkh2 | this study |
| 25 | S. cer Ace2-Mnase diploid | BY4743 Ace2-Mnase-KanMX4 ,hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 26 | S. par Ace2-Mnase diploid | OS142 (Diploid) Ace2-Mnase-KanMX4 ,hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 27 | Hybrid S.cer Ace2-MNase | Hybrid S.cer Ace2-Mnase-KanMX4, hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 28 | Hybrid S.par Ace2-MNase | Hybrid hoΔ::natNT2 / S.par Ace2-Mnase-KanMX4 hoΔ::hphNT1 | this study |
| 29 | Hybrid S.cer Swi5-MNase | Hybrid S.cer Swi5-Mnase-KanMX4, hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 30 | Hybrid S.par Swi5-MNase | Hybrid hoΔ::natNT2 / S.par Swi5-Mnase-KanMX4 hoΔ::hphNT1 | this study |
| 31 | Hybrid S.cer Fkh1-MNase | Hybrid S.cer Fkh1-Mnase-KanMX4, hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 32 | Hybrid S.par Fkh1-MNase | Hybrid hoΔ::natNT2 / S.par Fkh1-Mnase-KanMX4 hoΔ::hphNT1 | this study |
| 33 | Hybrid S.cer Fkh2-MNase | Hybrid S.cer Fkh2-Mnase-KanMX4, hoΔ::natNT2 / hoΔ::hphNT1 | this study |
| 34 | Hybrid S.par Fkh2-MNase | Hybrid hoΔ::natNT2 / S.par Fkh2-Mnase-KanMX4 hoΔ::hphNT1 | this study |
| 35 | S. cer Cln3 mutation | BY4741 CLN3 promoter SNP, CDC10-YFP-natNT2,ACS2-CFP-KanMX4 | this study |