**Supplementary Table 3.**  List of yeast strains.

|  |  |  |  |
| --- | --- | --- | --- |
| **Strain** | **Mutation** | **Genotype** | **Reference** |
| W303-1a |  | *Mat a ade2-1 leu2-2,112 his3-11,15 trp1 ura3-1 can1-100* | ([Thomas and Rothstein, 1989](#_ENREF_54)) |
| RAY160  | rtt106Δ | *Mat a ade2-1 leu2-2,112 his3-11,15 trp1 ura3-1 can1-100 rtt106::HIS3* | This study |
| RAY165  | rtt106Δcac1Δ | *Mat a ade2-1 leu2-2,112 his3-11,15 trp1 ura3-1 can1-100 rtt106::HIS3 cac1::KANMX* | This study |
| RAY187  | mPIP | RAY160 *CAC1 F233A/F234A* | This study |
| RAY180  | mWHD | RAY160 *CAC1 K564E/K568E* | This study |
| RAY192  | mPIP + mWHD | RAY160 *CAC1 F233A/F234A/K564E/K568E* | This study |
| RAY264  | ΔKER) | RAY160 *CAC1 Δ136-225* | This study |
| RAY265  | ΔKER + mPIP | RAY264 *CAC1 F233A/F234A* | This study |
| RAY266  | ΔKER + mWHD | RAY264 *CAC1 K564E/K568E* | This study |
| RAY221  | Δmiddle-AKER | RAY160 *CAC1 Δ155-204* | This study |
| RAY222  | Δmiddle-AKER + mPIP | RAY221 *CAC1 F233A/F234A* | This study |
| RAY223  | Δmiddle-AKER + mWHD | RAY221 *CAC1 K564E/K568E* | This study |
| RAY245  | 2xKER) | RAY160 *CAC1 dup(136-225)* | This study |
| RAY258  | 2xKER + mPIP | RAY245 *CAC1 F233A/F234A* | This study |
| RAY247  | 2xKER + mWHD | RAY245 *CAC1 K564E/K568E* | This study |
| RAY233  | yeast KER::human KER | RAY160 *CAC1 136-225::hCHAF1A 331-441* | This study |
| RAY256  | yeast KER::human KER + mPIP | RAY233 *CAC1 F233A/F234A* | This study |
| RAY243  | yeast KER::human KER + mWHD | RAY233 *CAC1 K564E/K568E* | This study |
| RAY226  | Δ225-226 | RAY160 *CAC1 Δ225-226* | This study |
| RAY239  | Δ225-226 + mPIP | RAY226 *CAC1 F223A/F234A* | This study |
| RAY241  | Δ225-226 + mWHD | RAY226 *CAC1 K564E/K568E* | This study |
| RAY207  | ∆145-149 | RAY160 *CAC1 Δ145-149* | This study |
| RAY216  | ∆145-149 + mPIP | RAY207 *CAC1 F233A/F234A* | This study |
| RAY218  | ∆145-149 + mWHD | RAY207 *CAC1 K564E/K568E* | This study |
| BY4741 |  | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0* | ([Baker Brachmann et al., 1998](#_ENREF_3)) |
| aRAY156 |  | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0 hmr::PURA3-GFP/URA3 TRP::BrdU-Inc(TRP) bar1::LEU2* | This study |
| aRAY152  | *sir2∆* | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0 hmr::PURA3-GFP/URA3 TRP::BrdU-Inc(TRP) sir2::KANMX* | This study |
| aRAY177  | *rtt106∆* | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0 hmr::PURA3-GFP/URA3 TRP::BrdU-Inc(TRP) bar1::LEU2 rtt106::HIS3* | This study |
| aRAY179  | *cac1∆* | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0 hmr::PURA3-GFP/URA3 TRP::BrdU-Inc(TRP) bar1::LEU2 cac1::KANMX* | This study |
| aRAY189  | *rtt106∆cac1∆* | *Mat a his3∆1 leu2∆0 met15∆0 ura3∆0 hmr::PURA3-GFP/URA3 TRP::BrdU-Inc(TRP) bar1::LEU2 rtt106::HIS3 cac1::KANMX* | This study |
| RAY193  | mPIP | RAY177 *CAC1 F233A/F234A* | This study |
| RAY194  | mWHD | RAY177 *CAC1 K564E/K568E* | This study |
| RAY199  | mPIP + mWHD | RAY177 *CAC1 F233A/F234A/K564E/K568E* | This study |
| RAY205  | ∆KER | RAY177 *CAC1 Δ136-225* | This study |
| RAY212  | ∆KER + mPIP | RAY205 *CAC1 F233A/F234A* | This study |
| RAY206  | ∆KER + mWHD | RAY205 *CAC1 K564E/K568E* | This study |
| RAY219  | ∆middle-A | RAY177 *CAC1 Δ155-204* | This study |
| RAY259  | ∆middle-A + mPIP | RAY219 *CAC1 F233A/F234A* | This study |
| RAY230  | ∆middle-A + mWHD | RAY219 *CAC1 K564E/K568E* | This study |
| RAY244  | 2xKER | RAY177 *CAC1 dup(136-225)* | This study |
| RAY263  | 2xKER + mPIP | RAY244 *CAC1 F233A/F234A* | This study |
| RAY246  | 2xKER + mWHD | RAY244 *CAC1 K564E/K568E* | This study |
| RAY232  | yeast KER::human KER | RAY177 *CAC1 136-225::hCHAF1A 331-441* | This study |
| RAY257  | yeast KER::human KER + mPIP | RAY232 *CAC1 F233A/F234A* | This study |
| RAY242  | yeast KER::human KER + mWHD | RAY232 *CAC1 K564E/K568E* | This study |
| RAY225  | ∆225-226 | RAY177 *CAC1 Δ225-226* | This study |
| RAY238  | ∆225-226 + mPIP | RAY225 *CAC1 F223A/F234A* | This study |
| RAY240  | ∆225-226 + mWHD | RAY225 *CAC1 K564E/K568E* | This study |
| RAY208  | ∆145-149 | RAY177 *CAC1 Δ145-149* | This study |
| RAY209  | ∆145-149 + mPIP | RAY208 *CAC1 F233A/F234A* | This study |
| RAY231  | ∆145-149 + mWHD | RAY208 *CAC1 K564E/K568E* | This study |
| RAY191  | CAC1-FLAG | *Mat a ade2-1 leu2-2,112 his3-11,15 trp1 ura3-1 can1-100 rtt106::HIS3 CAC1-3xFLAG* | This study |
| RAY195  | CAC1-FLAG mPIP | RAY191 *CAC1 F233A/F234A* | This study |
| RAY196  | CAC1-FLAG mWHD | RAY191 *CAC1 K564E/K568E* | This study |
| RAY197  | CAC1-FLAG mPIP + mWHD | RAY191 *CAC1 F233A/F234A/K564E/K568E* | This study |
| RAY203  | CAC1-FLAG ∆KER | RAY191 *CAC1 Δ136-225* | This study |
| RAY214  | CAC1-FLAG ∆KER + mPIP | RAY214 *CAC1 F233A/F234A* | This study |
| RAY207  | CAC1-FLAG ∆KER + mWHD | RAY214 *CAC1 K564E/K568E* | This study |
| RAY220  | CAC1-FLAG Δmiddle-A | RAY191 *CAC1 Δ155-204* | This study |
| RAY250  | CAC1-FLAG ∆middle-A + mPIP | RAY250 *CAC1 F233A/F234A* | This study |
| RAY224  | CAC1-FLAG ∆middle-A + mWHD | RAY250 *CAC1 K564E/K568E* | This study |
| RAY254  | CAC1-FLAG 2xKER | RAY191 *CAC1 dup(136-225)* | This study |
| RAY255  | CAC1-FLAG 2xKER + mPIP | RAY254 *CAC1 F233A/F234A* | This study |
| RAY261  | CAC1-FLAG 2xKER + mWHD | RAY254 *CAC1 K564E/K568E* | This study |
| RAY262  | CAC1-FLAG yeast KER::human KER | RAY191 *CAC1 136-225::hCHAF1A 331-441* | This study |
| RAY260  | CAC1-FLAG yeast KER::human KER + mPIP | RAY262 *CAC1 F233A/F234A* | This study |
| RAY253  | CAC1-FLAG yeast KER::human KER + mWHD | RAY262 *CAC1 K564E/K568E* | This study |
| RAY229  | CAC1-FLAG ∆225-226 | RAY191 *CAC1 Δ225-226* | This study |
| RAY248  | CAC1-FLAG ∆225-226 + mPIP | RAY248 *CAC1 F223A/F234A* | This study |
| RAY249  | CAC1-FLAG ∆225-226 + mWHD | RAY229 *CAC1 K564E/K568E* | This study |
| RAY215  | CAC1-FLAG ∆145-149 | RAY191 *CAC1 Δ145-149* | This study |
| RAY251  | CAC1-FLAG ∆145-149 + mPIP | RAY251 *CAC1 F233A/F234A* | This study |
| RAY217  | CAC1-FLAG ∆145-149 + mWHD | RAY251 *CAC1 K564E/K568E* | This study |
| YDS12 | tetO7-CDC9 | *Mat ⍺ ade2-1 trp 1-1 cac1-100 leu2-3,112 his3-11,15 ura3-1 cdc9::tetO7-CDC9 cmv-Laci-NAT* | ([Yeung and Smith, 2020](#_ENREF_64)) |
| NAY001 | tetO7-CDC9 | *Mat a ade2-1 trp 1-1 cac1-100 leu2-3,112 his3-11,15 ura3-1 cdc9::tetO7-CDC9 cmv\_Laci-NAT* | This study |
| NAY002 | tetO7-CDC9 + *rtt106Δ* | *Mat a ade2-1 trp 1-1 cac1-100 leu2-3,112 his3-11,15 ura3-1 cdc9::tetO7-CDC9 cmv\_Laci-NAT rtt106::HIS* | This study |
| NAY003 | tetO7-CDC9 + *cac1Δ* | *Mat a ade2-1 trp 1-1 cac1-100 leu2-3,112 his3-11,15 ura3-1 cdc9::tetO7-CDC9 cmv\_Laci-NAT cac1::KAN* | This study |
| NAY004 | tetO7-CDC9 + *cac1Δ + rtt106Δ* | *Mat a ade2-1 trp 1-1 cac1-100 leu2-3,112 his3-11,15 ura3-1 cdc9::tetO7-CDC9 cmv\_Laci-NAT rtt106::HIS cac1::KAN* | This study |
| NAY005 | tetO7-CDC9 + ΔKER | NAY001 *CAC1 Δ136-225* | This study |
| NAY006 | tetO7-CDC9 + *rtt106Δ* + ΔKER | NAY002 *CAC1 Δ136-225* | This study |
| NAY007 | tetO7-CDC9 + Δmiddle-AKER | NAY001 *CAC1 Δ155-204* | This study |
| NAY008 | tetO7-CDC9 + *rtt106Δ* + Δmiddle-AKER | NAY002 *CAC1 Δ155-204* | This study |
| NAY009 | tetO7-CDC9 + 2xKER | NAY001 *CAC1 dup(136-225)* | This study |
| NAY010 | tetO7-CDC9 + *rtt106Δ* + 2xKER | NAY002 *CAC1 dup(136-225)* | This study |

*a BrdU-Inc(*[Viggiani and Aparicio, 2006](#_ENREF_56)*); hmr::PURA3-GFP/URA3(*[Laney and Hochstrasser, 2003](#_ENREF_30)*).*

**Supplementary References**

Laney, Jeffrey D., and Mark Hochstrasser. 2003. 'Ubiquitin-dependent degradation of the yeast Matα2 repressor enables a switch in developmental state', *Genes and Development*, 17: 2259-70.

Viggiani, Christopher J., and Oscar M. Aparicio. 2006. 'New vectors for simplified construction of BrdU-Incorporating strains of Saccharomyces cerevisiae', *Yeast*, 23: 1045-51.