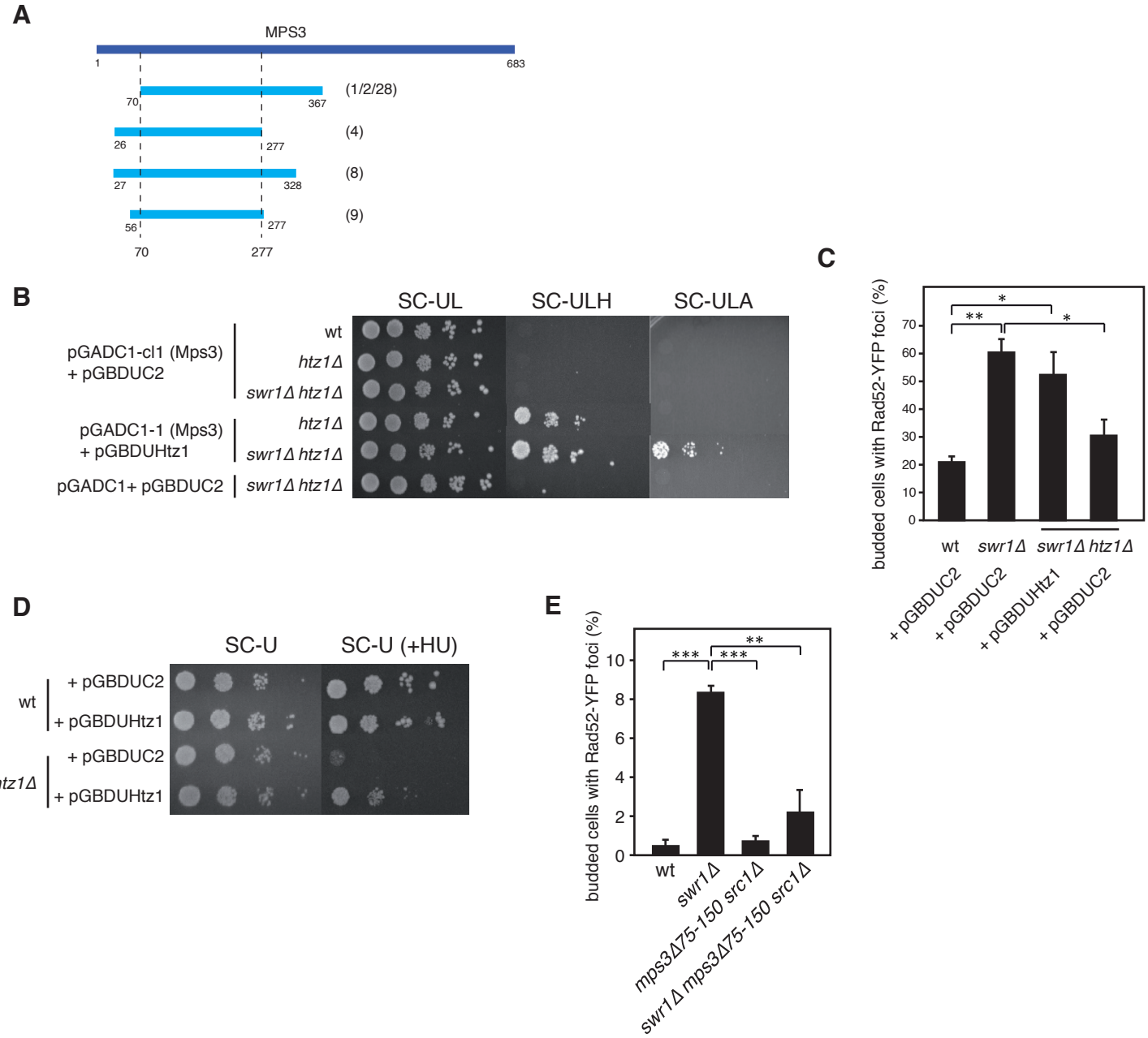
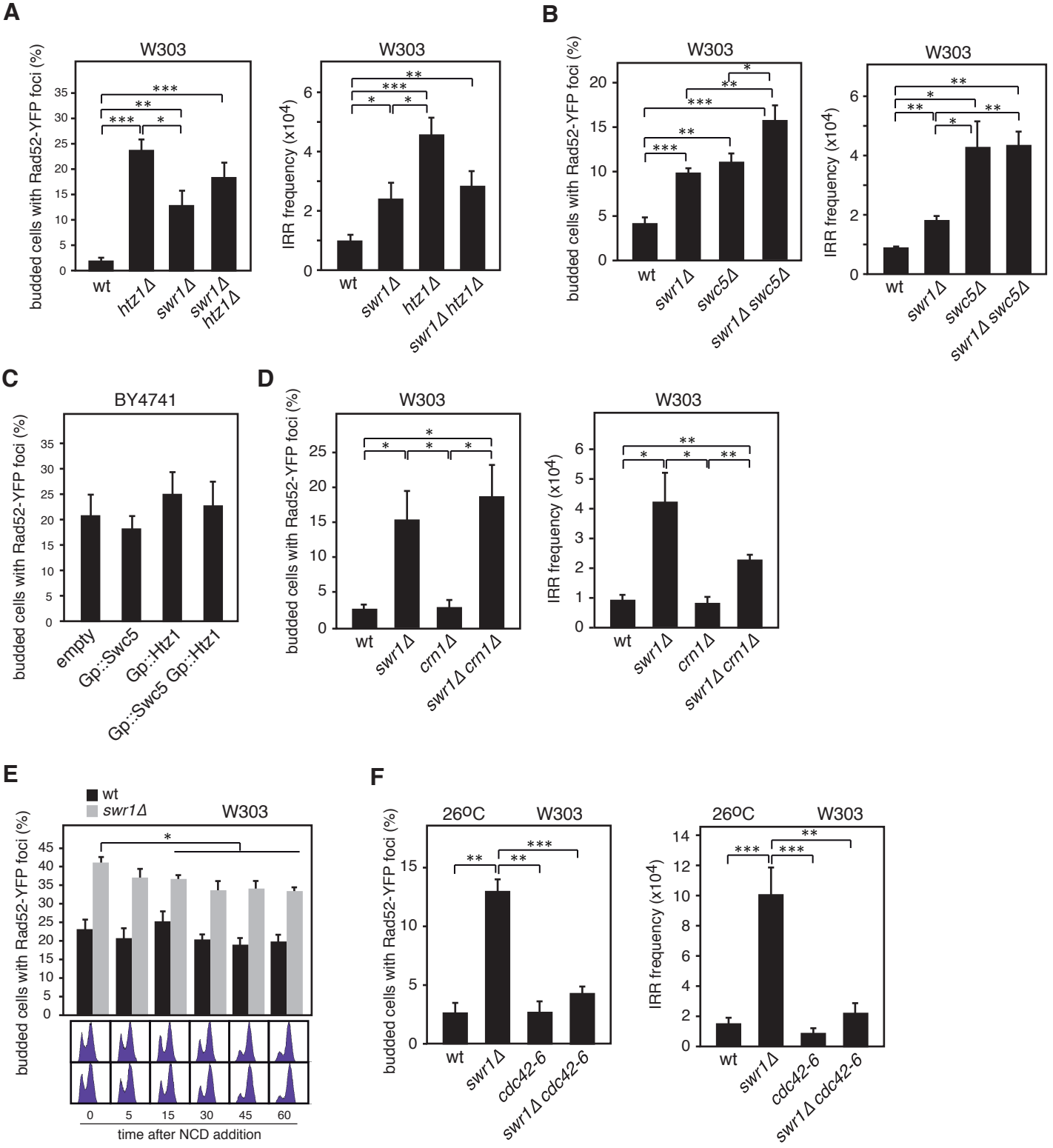
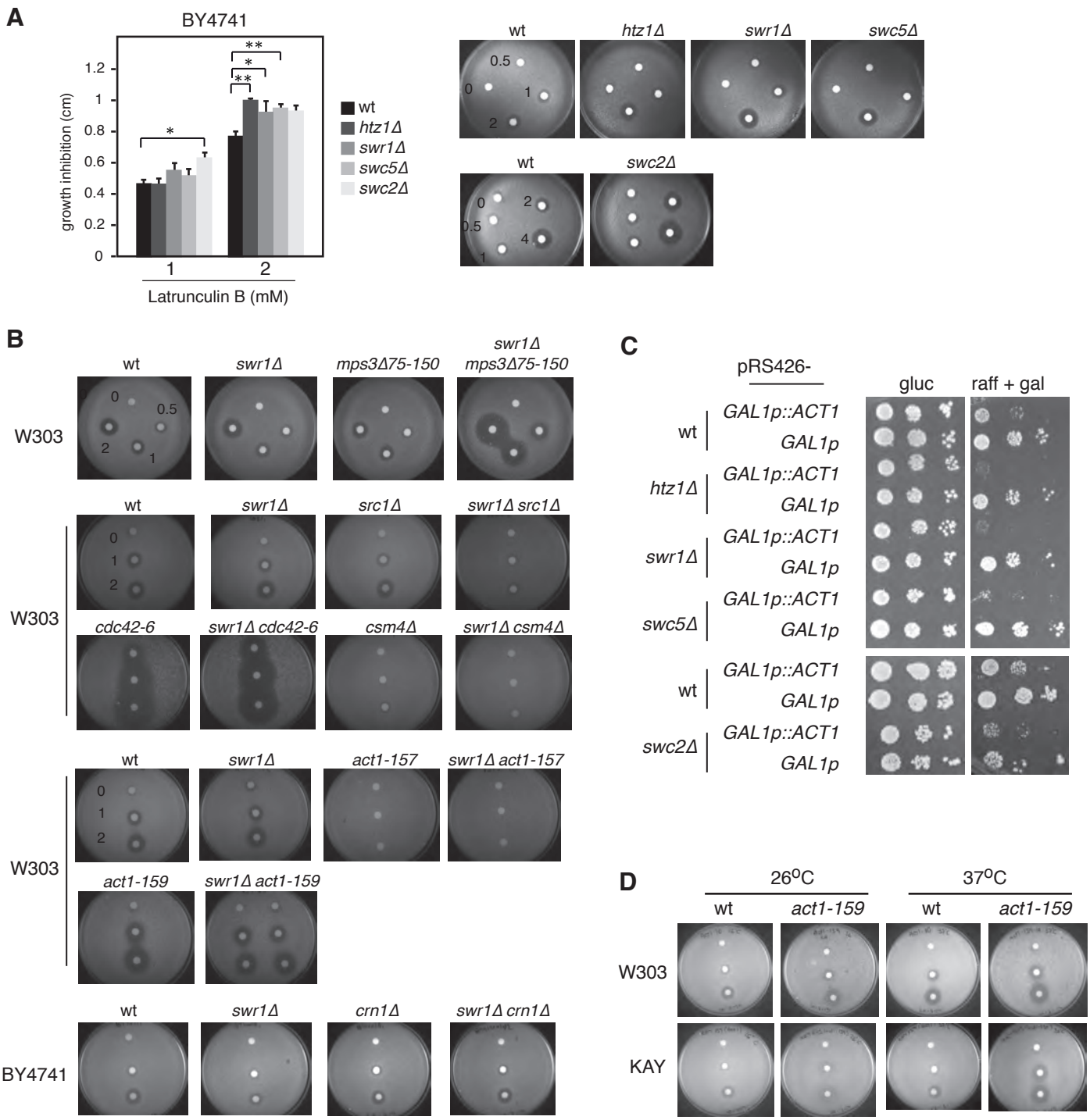
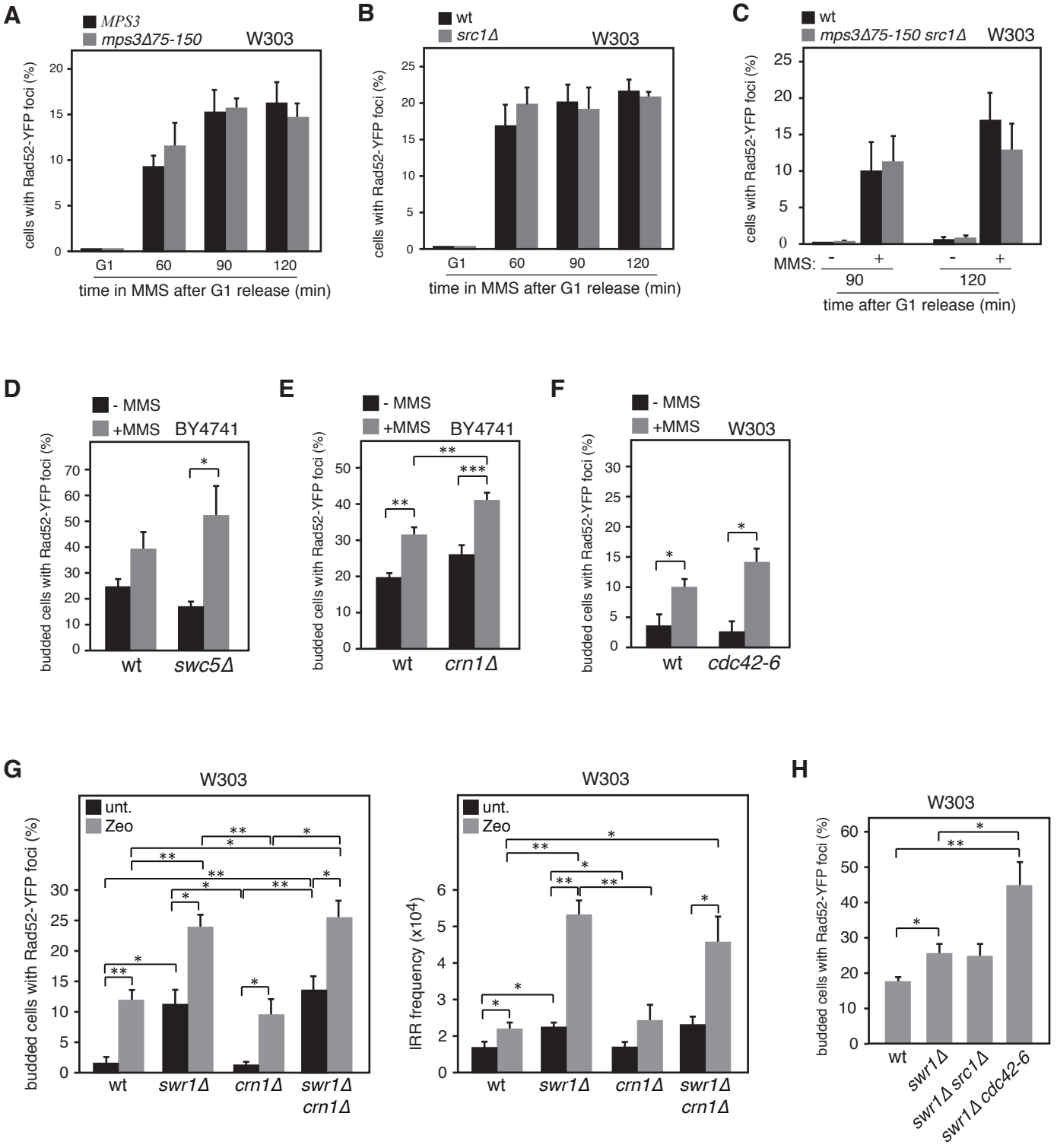
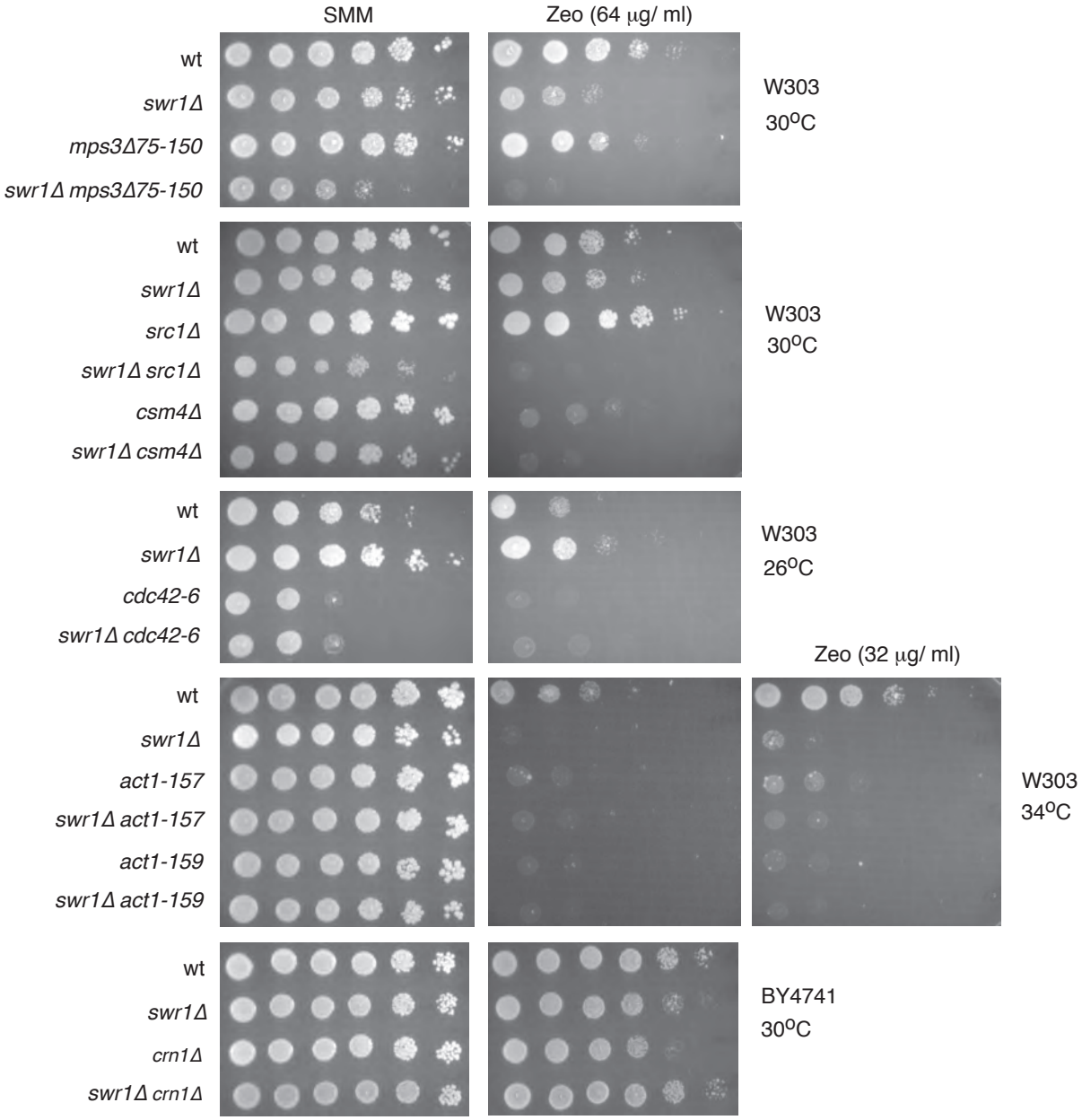

A
MPS3
1
683
70
367
(1/2/28)
26
277
(4)
27
328
(8)
56
277
(9)
70
277
B
SC-UL
SC-ULH
SC-ULA
pGADC1-cl1 (Mps3)
+ pGBDUC2
wt
htz1Δ
swr1Δ htz1Δ
pGADC1-1 (Mps3)
+ pGBDUHtz1
htz1Δ
swr1Δ htz1Δ
pGADC1+ pGBDUC2
swr1Δ htz1Δ
C
budded cells with Rad52-YFP foci (%)
0
10
20
30
40
50
60
70
*
**
*
wt
swr1Δ
swr1Δ htz1Δ
+ pGBDUC2
+ pGBDUC2
+ pGBDUHtz1
+ pGBDUC2
D
SC-U
SC-U (+HU)
wt
htz1Δ
+ pGBDUC2
+ pGBDUHtz1
+ pGBDUC2
+ pGBDUHtz1
E
budded cells with Rad52-YFP foci (%)
0
2
4
6
8
10
***
***
**
wt
swr1Δ
mps3Δ75-150 src1Δ
swr1Δ mps3Δ75-150 src1Δ

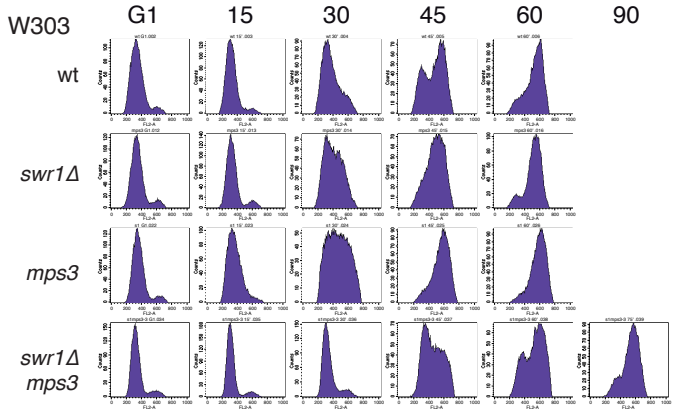

A
W303
budded cells with Rad52-YFP foci (%)
wt
htz1Δ
swr1Δ
swr1Δ htz1Δ
W303
IRR frequency (x10^4)
wt
swr1Δ
htz1Δ
swr1Δ htz1Δ
B
W303
budded cells with Rad52-YFP foci (%)
wt
swr1Δ
swc5Δ
swr1Δ swc5Δ
W303
IRR frequency (x10^4)
wt
swr1Δ
swc5Δ
swr1Δ swc5Δ
C
BY4741
budded cells with Rad52-YFP foci (%)
empty
Gp::Swc5
Gp::Htz1
Gp::Swc5 Gp::Htz1
D
W303
budded cells with Rad52-YFP foci (%)
wt
swr1Δ
crn1Δ
swr1Δ crn1Δ
W303
IRR frequency (x10^4)
wt
swr1Δ
crn1Δ
swr1Δ crn1Δ
E
wt
swr1Δ
W303
budded cells with Rad52-YFP foci (%)
0
5
15
30
45
60
time after NCD addition
F
26ºC
W303
budded cells with Rad52-YFP foci (%)
wt
swr1Δ
cdc42-6
swr1Δ cdc42-6
26ºC
W303
IRR frequency (x10^4)
wt
swr1Δ
cdc42-6
swr1Δ cdc42-6

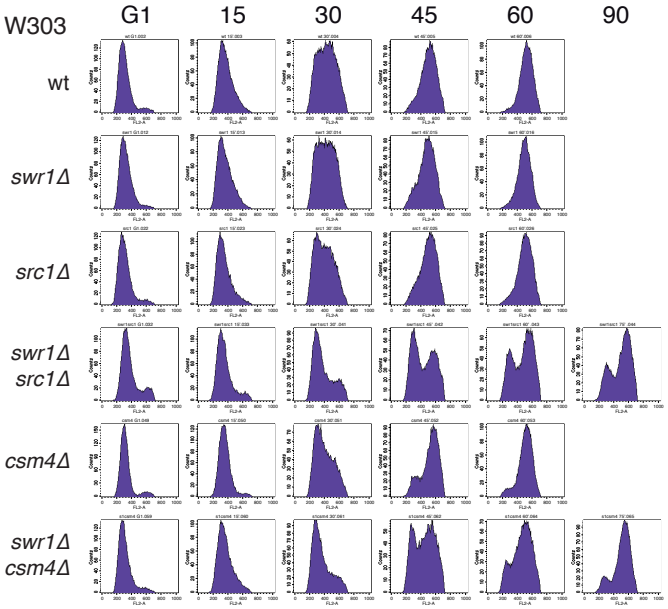

A
BY4741
growth inhibition (cm)
Latrunculin B (mM)
wt
htz1Δ
swr1Δ
swc5Δ
swc2Δ
B
W303
BY4741
mps3Δ75-150
swr1Δ mps3Δ75-150
src1Δ
swr1Δ src1Δ
cdc42-6
swr1Δ cdc42-6
csm4Δ
swr1Δ csm4Δ
act1-157
swr1Δ act1-157
act1-159
swr1Δ act1-159
crn1Δ
swr1Δ crn1Δ
C
pRS426-
gluc
raff + gal
GAL1p::ACT1
GAL1p
D
26ºC
37ºC
act1-159
KAY

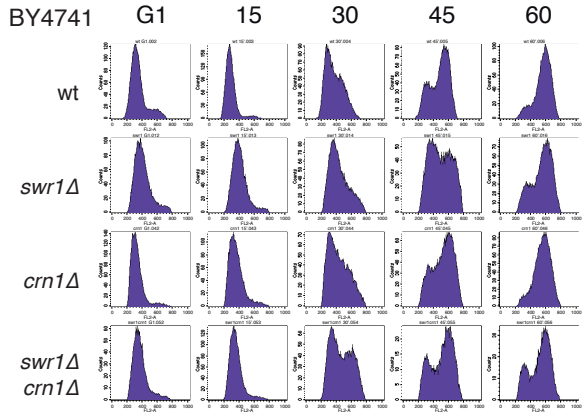
Morillo-Huesca_Figure S4

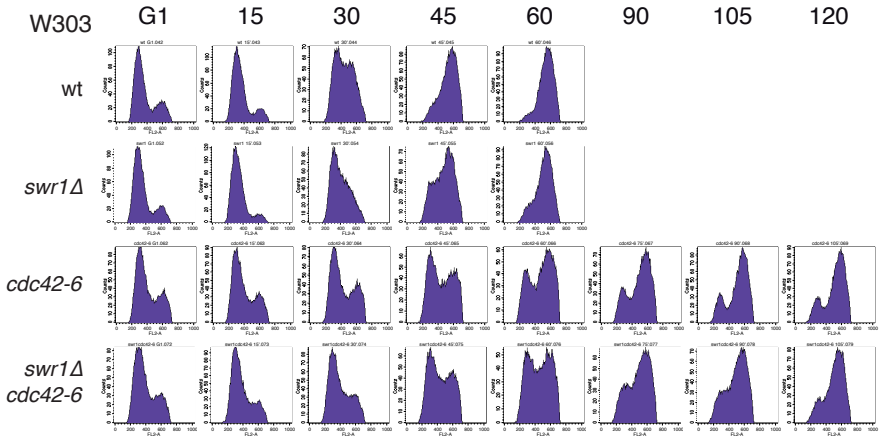


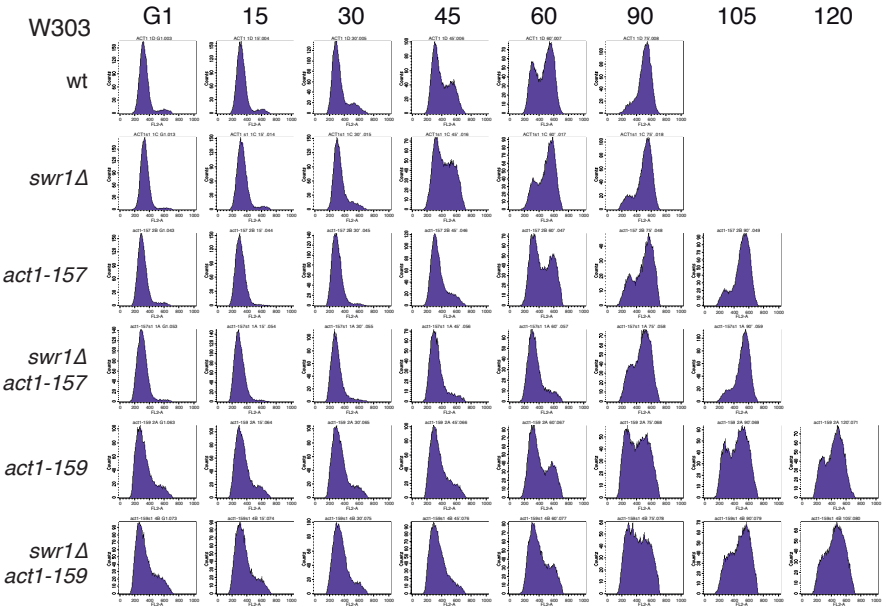

SMM
Zeo (64 μg/ ml)
wt
swr1Δ
mps3Δ75-150
swr1Δ mps3Δ75-150
W303
30°C
wt
swr1Δ
src1Δ
swr1Δ src1Δ
csm4Δ
swr1Δ csm4Δ
W303
30°C
wt
swr1Δ
cdc42-6
swr1Δ cdc42-6
W303
26°C
Zeo (32 μg/ ml)
wt
swr1Δ
act1-157
swr1Δ act1-157
act1-159
swr1Δ act1-159
W303
34°C
wt
swr1Δ
crn1Δ
swr1Δ crn1Δ
BY4741
30°C

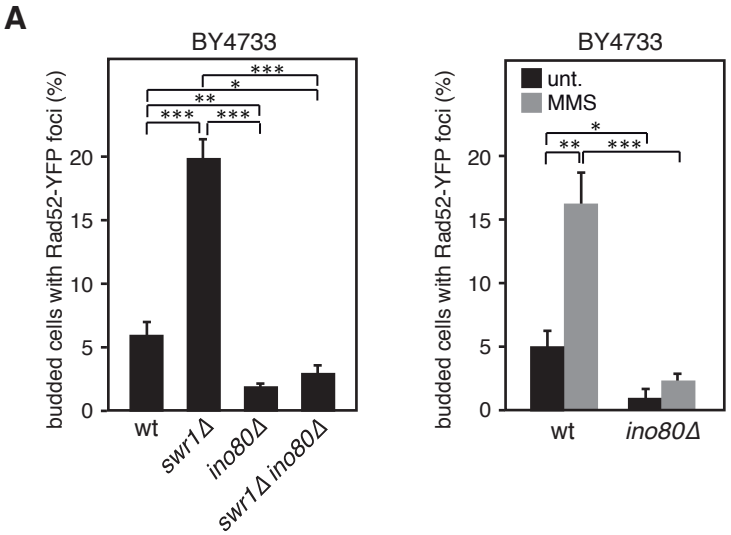

W303
G1
15
30
45
60
90
wt
swr1Δ
mps3
swr1Δ
mps3

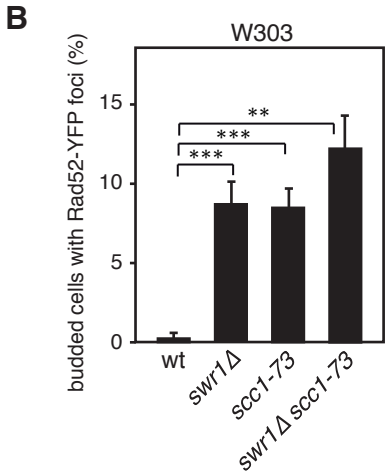

W303
G1
15
30
45
60
90
wt
swr1Δ
src1Δ
swr1Δ
src1Δ
csm4Δ
swr1Δ
csm4Δ


BY4741
G1
15
30
45
60
wt
swr1Δ
crn1Δ
swr1Δ
crn1Δ


W303
G1
15
30
45
60
90
105
120
wt
swr1Δ
cdc42-6
swr1Δ
cdc42-6


W303
G1
15
30
45
60
90
105
120
wt
swr1Δ
act1-157
swr1Δ
act1-157
act1-159
swr1Δ
act1-159


A
BY4733
budded cells with Rad52-YFP foci (%)
0
5
10
15
20
***
*
**
***
***
wt
swr1Δ
ino80Δ
swr1Δ ino80Δ
BY4733
unt.
MMS
*
**
***
wt
ino80Δ


B
W303
budded cells with Rad52-YFP foci (%)
0
5
10
15
**
***
***
wt
swr1Δ
scc1-73
swr1Δ scc1-73

SUPPLEMENTARY INFORMATION

Supplementary Figure Legends

Figure S1. The amino-terminal region of Mps3 interacts with Htz1. (A) Mps3 polypeptides found as interactors of Htz1. The shared region spans from amino acids 70 to 277. The number of the positive clones obtained in the screening is shown on the right. **(B)** Two-hybrid interaction between Htz1 (fused to the Gal4 DNA binding domain; plasmid pGBDUHtz1) and the amino-terminal region of Mps3 (clone 1: amino acids 70 to 367) (fused to the Gal4 activation domain; plasmid pGADC-cl1) as determined by growth in SMM medium lacking either histidine or adenine, which select cells able to express the markers *HIS3* and *ADE3* from the Gal4-dependent promoters *GAL1p* and *GAL2p*, respectively. Plasmids pGADC1 and pGBDUC2 were used as negative controls. The interactions were observed both in *swr1*Δ *htz1*Δ and *htz1*Δ strains. The interaction of one of the six clones is shown. **(C, D)** GBD-Htz1 functionality as determined by suppression of *swr1*Δ-induced Rad52 foci (C) and complementation of *htz1*Δ sensitivity to 150 mM hydroxyurea (HU) (D). (B-D) Strains are PJ69-4A background. **(E)** Effect of the double mutation *mps3*Δ*75-150 src1*Δ (W303 background) on *swr1*Δ-induced Rad52-YFP foci accumulation. (C, E) Approximately 100 budded cells per culture were analyzed for Rad52 foci. The average and SEM from 3-4 independent cultures per genotype/condition are shown. Statistically significant differences according to a two-tailed unpaired Student's *t*-test are shown; whereby one, two and three asterisks represent *P*-values of <0.05, <0.01 and <0.001, respectively.

Figure S2. The absence of Htz1, Swc5 and Crn1 do not suppress *swr1*Δ-mediated increase in IRR and Rad52 foci on W303 background. Effects of *htz1*Δ **(A)**, *swc5*Δ **(B)** and *crn1*Δ **(D)** (W303 background) on *swr1*Δ-induced Rad52-YFP foci accumulation and IRR increase. **(C) Htz1 and/or Swc5 overexpression does not affect Rad52 foci accumulation.** Wild-type cells (BY4741 background) transformed with plasmids pWJ1344 and pTL28HTZ1 and/or p426GAL1SWC5 were grown in galactose-containing medium till mid-log phase and the percentage of budded cells with Rad52 foci was determined by fluorescence microscopy. Cells transformed with pRS426GAL1 and/or pTL28 were used as control (empty). **(E) Microtubule depolymerization does not affect *swr1*Δ-induced recombination.** Effect of nocodazole (NCD) treatment for the indicated times on the accumulation of Rad52-YFP foci in wild type and *swr1*Δ cells (W303 background). Cell cycle arrest was followed by FACS analysis. **(F) *cdc42-6* supresses *swr1*Δ-associated recombination at semipermissive temperature**. Effects of *cdc42-6* (W303 background) on *swr1*Δ-induced Rad52-YFP foci accumulation and IRR increase at semipermissive temperature (26°C). Approximately 100 budded cells per culture were analyzed for Rad52 foci. The average and SEM from 8 (A), 3-4 (B), 4 (C, D), 4-6 (E) and 3-8 (F) independent cultures per genotype/condition are shown. IRR was determined from 3-5 (A), 3 (B, D) and 3-6 (F) fluctuation tests. Statistically significant differences according to a two-tailed unpaired Student's *t*-test are shown; one, two, and three asterisks represent *P*-values of <0.05, <0.01 and <0.001, respectively.

Figure S3. (A) Latrunculin B sensitivity of the indicated strains (BY4741 background) as determined by a halo assay. The diameter of the circle of growth inhibition minus the diameter of the paper disc (0.5 cm) is plotted for each drug concentration. The average and SEM from 12 (wild-type), 8 (*swr1*Δ) and 3 halos (rest) are shown. Statistically significant differences according to a two-tailed unpaired Student's *t*-test are shown; one, two, and three asterisks represent *P*-values of <0.05, <0.01 and <0.001, respectively. Representative images for each genotype are shown on the right. **(B)** Representative images from the analyses shown in Figure 5, A-D. **(C)** Actin over-expression sensitivity of wild type, *htz1*Δ, *swr1*Δ, *swc5*Δ and *swc2*Δ cells (BY4741 background)

transformed with either pRS426-GACT1 or pRS426-GAL1 as determined by ten-fold serial dilutions in SMM medium containing glucose (*GAL1p::ACT1* repression) or galactose (*GAL1p::ACT1* expression). The experiment was repeated twice with similar results. **(D)** Latrunculin B sensitivity of wild-type and *act1-159* strains in KAY and W303-1A background at 26°C and 37°C as determined by a halo assay.

Figure S4. (A–C) Effects of *mps3Δ75-150* (A), *src1Δ* (B) and *mps3Δ75-150 src1Δ* (C) (W303 background) on the accumulation of MMS-induced Rad52-YFP foci. Cells were synchronized in G1 and released in the absence or presence of 0.01% MMS for the indicated times. The percentage of total cells with Rad52 foci is presented, as all cells are released into S phase and can form Rad52 foci. **(D–F)** Effect of *swc5Δ* (D), *crn1Δ* (E) (BY4741 backgrounds) and *cdc42-6* (F) (W303 background) on the accumulation of Rad52-YFP foci after 2 hours in the absence or presence of 0.05% MMS. **(G)** Effects of *crn1Δ* (W303 background) on *swr1Δ*-specific accumulation of zeocin-induced Rad52-foci (8 μg/ml) and IRR (32 μg/ml). **(H)** Effect of *src1Δ* and *cdc42-6* (W303 background) on MMS (0.05%)-induced Rad52-foci accumulation in *swr1Δ*. Approximately 100 cells per culture were analyzed for Rad52 foci. The average and SEM from 3 (A–D, F), 6-10 (E), 3 (G) and 3-4 (H) independent cultures per genotype/condition are shown. IRR in (G) was determined from 3 fluctuation tests. The analysis in (G) was performed at pH7.4. Statistically significant differences according to a two-tailed unpaired Student's *t*-test are shown; one, two and three asterisks represent *P*-values of <0.05, <0.01 and <0.001, respectively.

Figure S5. Zeocin sensitivity of the indicated strains as determined by ten-fold serial dilutions on zeocin-containing medium (pH 7.4). At this pH, *cdc42-6* mutants did not grow at 30°C, and all cells, including the wild type, did not grow at 37°C in the presence of 32 or 64 μg/ml zeocin. Thus, all analyses were done at 30°C, except for *cdc42-6* (26°C) and *act1* (34°C) mutants. Note that at 34°C the *swr1Δ* mutant was highly sensitive to zeocin.

Figure S6. Cell growth analyses by FACS of the indicated strains. Cells were synchronized in G1 and released into fresh medium for the indicated times (minutes). All analyses were done at 30°C, except for *cdc42-6* (26°C), as this mutant did not synchronise properly in G1 at 30°C, and *act1* mutants (37°C).

Figure S7. (A) Effects of the absence of Ino80 (BY4733 background) on spontaneous, *swr1Δ* and MMS-induced Rad52 foci. Rad52 foci were analyzed in asynchronous mid-log phase cultures (left) or in G1-synchronyzed cells released in the absence or presence of 0.01% MMS for 60 min (right). **(B)** Effect of *scc1-73* (W303 background) on *swr1Δ*-induced Rad52-YFP foci accumulation in asynchronous mid-log phase cultures grown at 26°C. Approximately 100 cells per culture were analyzed for Rad52 foci. The average and SEM from 5-12 (A, left), 6 (A, right) or 4 (B) independent cultures per genotype/condition are shown. Statistically significant differences according to a two-tailed unpaired Student's *t*-test are shown; two and three asterisks represent *P*-values of <0.01 and <0.001, respectively.

Table S1A. ***Saccharomyces cerevisiae*** **strains used in this study**

Strain	Genotype	Ref.
W303-1aR5	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5*	(González-Prieto *et al.* 2013)
W303-1bR5	*MATα leu2-3,112 trp1-1ura3-1 ade2-1 can1-100 his3-11 RAD5*	(González-Prieto *et al.* 2013)
W303s1-3A	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swr1::kanMX4*	This work
Wr52-5a	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 rad52::HygMX4*	(Barrientos-Moreno *et al.* 2018)
Ws1r52-1A	*MATα leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 rad52::HygMX4 swr1Δ::kanMX4*	This work
Ws1r52-1C	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 rad52::HygMX4 swr1Δ::kanMX4*	This work
Ws1r52-2C	*MATα leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 rad52::HygMX4 swr1Δ::kanMX4*	This work
Wrfa1-23A	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 RFA1-8ala-YFP*	This work
Wrfa1-31D	*MATα leu2-3,112 trp1-1 ura3-1 can1-100 his3-11 RAD5 RFA1-8ala-YFP*	This work
Ws1rfa1-17C	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 RFA1-8ala-YFP swr1::kanMX4*	This work
Ws1rfa1-23B	*MATa leu2-3,112 trp1-1 ura3-1 can1-100 his3-11 RAD5 RFA1-8ala-YFP swr1::kanMX4*	This work
WMPS3-2D	*MATa ura3-1 trp1-1his3-11 lys2Δ RAD5 mps3::NATMX LEU2::MPS3- leu2-3,112*	This work
WMPS3s1-5C	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::MPS3- leu2-3,112 swr1::kanMX4*	This work
Wmps3-1C	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::mps3Δ75-150- leu2-3,112*	This work
Wmps3s1-1A	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
WMPS3l2-3D	*MATa ura3-1 trp1-1his3-11 lys2Δ RAD5 mps3::NATMX*	This work

	LEU2::HygMX4MX4::MPS3- leu2-3,112	
WMPS3s1l2-12	*MATa ura3-1 trp1-1his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::MPS3- leu2-3,112 swr1::kanMX4*	This work
Wmps3l2-3B	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112*	This work
Wmps3l2-8C	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112*	This work
Wmps3s1l2-1	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
Wmps3s1l2-3	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
Wmps3s1l2-5	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
Wmp3s1l2-1-1.2	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
Wmp3s1l2-3-1.2	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::HygMX4::mps3Δ75-150- leu2-3,112 swr1::kanMX4*	This work
Wmp3sr1-3a	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::mps3Δ75-150- leu2-3,112 src1::HygMX4*	This work
Wmp3sr1s1-3c	*MATa ura3-1 trp1-1ade2-1 his3-11 lys2Δ RAD5 mps3::NATMX LEU2::mps3Δ75-150- leu2-3,112 src1::HygMX4 swr1::kanMX4*	This work
W303csm4	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 csm4::HygMX4*	This work
W303csm4s1-1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 csm4::HygMX4 swr1::kanMX4*	This work
W303src1-9C	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 src1::HygMX4*	This work
W303src1s1-1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swr1::kanMX4 src1::HygMX4*	This work
WNUP49che-3	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 bar1::hisG NUP49::cherry-KanMX4*	This work
Ws1NUP49che-1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 bar1::hisG NUP49::cherry-KanMX4 swr1::HygMX4*	This work

Ws1NUP49che-4	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 bar1::hisG NUP49::cherry-KanMX4 swr1::HygMX4*	This work
Wc42-9a	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 cdc42-6*	This work
Wc42-6b	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 cdc42-6*	This work
Ws1c42R5-2A	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 cdc42-6 swr1Δ::kanMX4*	This work
Ws1c42R5-2B	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 cdc42-6 swr1Δ::kanMX4*	This work
Ws1c42R5-4B	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 cdc42-6 swr1Δ::kanMX4*	This work
WACT1-1D	*MATa ade2-1 ura3-1 leu2-3,112 his3-11 RAD5 tub2-201 ACT1::HIS3*	This work
WACT1-2A	*MATa trp1-1 ade2-1 ura3-1 leu2-3,112 his3-11 RAD5 tub2-201 ACT1::HIS3*	This work
WACT1s1-1C	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 RAD5 tub2-201 ACT1::HIS3 swr1Δ::kanMX4*	This work
WACT1s1-3C	*MATa ade2-1 ura3-1 leu2-3,112 his3-11 RAD5 tub2-201 ACT1::HIS3 swr1Δ::kanMX4*	This work
Wact1-157-2B	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-157::HIS3*	This work
Wact1-157-9A	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-157::HIS3*	This work
Wact1-157s1-1A	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-157::HIS3 swr1Δ::kanMX4*	This work
Wact1-157s1-3A	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-157::HIS3 swr1Δ::kanMX4*	This work
Wact1-159-2A	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-159::HIS3*	This work
Wact1-159-6A	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-159::HIS3*	This work
Wact1-159s1-1B	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-159::HIS3 swr1Δ::kanMX4*	This work
Wact1-159s1-4B	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5*	This work

	tub2-201 act1-159::HIS3 swr1Δ::kanMX4	
Wact1-159s1-6B	*MATa trp1-1 ura3-1 leu2-3,112 his3-11 ade2-1 ¿ade4? RAD5 tub2-201 act1-159::HIS3 swr1Δ::kanMX4*	This work
W303h1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 htz1::HygMX*	(Morillo-Huesca *et al.* 2010)
W303s1	*MATα leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swr1::kanMX4*	(Morillo-Huesca *et al.* 2010)
W303h1s1-1A	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 htz1::HygMX4 swr1::kanMX4*	(Morillo-Huesca *et al.* 2010)
W303h1s1-3C	*MATα leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 htz1::HygMX4 swr1::kanMX4*	(Morillo-Huesca *et al.* 2010)
W303h1s1-1C	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 htz1::HygMX4 swr1::kanMX4*	This work
Wswc5Δ-1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swc5::kanMX4*	This work
Wswc5Δ-2	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swc5::kanMX4*	This work
Ws1s5-4b	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swc5::kanMX4 swr1::kanMX4*	This work
Ws1s5-5c	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swc5::kanMX4 swr1::kanMX4*	This work
Wcrn1-1B	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 crn1::HygMX4*	This work
Wcrn1-2A	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 crn1::HygMX4*	This work
Ws1crn1-1	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swr1::kanMX4 crn1::HygMX4*	This work
Ws1crn1-2	*MATa leu2-3,112 trp1-1 ura3-1 ade2-1 can1-100 his3-11 RAD5 swr1::kanMX4 crn1::HygMX4*	This work
Wscc1-73-2c	*MATa leu2-3,112 ura3-1 ade2-1 can1-100 his3-11 RAD5 scc1_73*	This work
Wscc1-73-7b	*MATa leu2-3,112 ura3-1 ade2-1 can1-100 his3-11 RAD5 scc1_73*	This work

Ws1scc1-73-1A	*MATa leu2-3,112 trp1- ura3-1 ade2-1 can1-100 his3-11 RAD5 scc1_73 swr1::kanMX4*	This work
Ws1scc1-73-2D	*MATa leu2-3,112 trp1- ura3-1 ade2-1 can1-100 his3-11 RAD5 scc1_73 swr1::kanMX4*	This work
BY4741	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0*	Euroscarf
Y03693	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 swr1Δ::kanMX4*	Euroscarf
Y03371	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 swc5Δ::kanMX4*	Euroscarf
BYs1s5-1	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 swc5Δ::kanMX4 swr1::HygMX4*	This work
Y06032	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 crn1Δ::kanMX4*	Euroscarf
BYcrn1s1-1	*MATα his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 crn1Δ::kanMX4 swr1::HygMX4*	This work
BYcrn1s1-12	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 crn1Δ::kanMX4 swr1::HygMX4*	This work
BYcrn1s1-24	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 crn1Δ::kanMX4 swr1::HygMX4*	This work
Y01703	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 htz1Δ::kanMX4*	Euroscarf
Y04319	*MATa his3Δ1 leu2Δ0 ura3Δ0 met15Δ0 swc2Δ::kanMX4*	Euroscarf
BY4733	*MATa his3-200 leu2 met15 trp1-63 ura3*	Research Genetics
BY33s1	*MATa his3-200 leu2 met15 trp1-63 ura3 swr1::hyg*	(Morillo-Huesca *et al.* 2010)
GA-2264	*MATa his3-200 leu2 met15 trp1-63 ura3 ino80ΔTRP1*	Shen et al. 2000
BY33i80s1	*MATa his3-200 leu2 met15 trp1-63 ura3 ino80ΔTRP1swr1::hyg*	(Morillo-Huesca *et al.* 2010)
PJ69-4A	*MATa ura3-52 his3-200 leu2-3,112 trp1-901 gal4Δ gal80Δ LYS2::GAL1-HIS3 met2::GAL7-lacZ GAL2-ADE2*	(James *et al.* 1996)
508h1	*MATα ura3-52 his3-200 leu2-3,112 trp1-901 gal4Δ gal80Δ LYS2::GAL1-HIS3 met2::GAL7-lacZ GAL2-ADE2 htz1::kanMX4*	This work
5078h1s1	*MATa ura3-52 his3-200 leu2-3,112 trp1-901 gal4Δ gal80Δ LYS2::GAL1-HIS3 met2::GAL7-lacZ GAL2-ADE2 htz1::kanMX4 swr1::HygMX4*	This work
507s1	*MATa ura3-52 his3-200 leu2-3,112 trp1-901 gal4Δ gal80Δ LYS2::GAL1-HIS3 met2::GAL7-lacZ GAL2-ADE2 swr1::HygMX4*	This work

KAY159	*MATa ura3-52, leu2-3,112, cry1, tub2- 201, ACT1::HIS3, his3Δ200)*	(Gourlay *et al*. 2004)
KAY375	*MAT**a** ura3-52, leu2-3,112, ade4, ade2, tub2-201, act1-159::HIS3, his3Δ200*	(Gourlay *et al*. 2004)

All the strains are isogenic to W303-1A, BY4741, BY4733, PJ69-4A or KAY159

Table S1B. *Saccharomyces cerevisiae* strains used in each Figure

Figure	Strains
Figure1A	**wt** (W303-1aR5); ***swr1*Δ** (W303s1-3A); ***rad52Δ*** (Wr52-5a); ***swr1Δrad52Δ*** (Ws1r52-1A; Ws1r52-1C; Ws1r52-2C)
B	**wt** (Wrfa1-23A; Wrfa1-31D); ***swr1*Δ** (Ws1rfa1-17C; Ws1rfa1-23B)
C	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
Figure2B	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
C	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
D	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
E	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
F	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
G	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
H	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
I	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
J	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***rad52Δ*** (Wr52-5a)
Figure3A	**wt** (WMPS3-2D); ***swr1Δ*** (WMPS3s1-5C); ***mps3*Δ*75-150*** (Wmps3-1C); ***swr1Δmps3*Δ*75-150*** (Wmps3s1-1A) **wt** (WMPS3l2-3D); ***swr1Δ*** (WMPS3s1l2-12); ***mps3*Δ*75-150*** (Wmps3l2-3B; Wmps3l2-8C); ***swr1Δ mps3*Δ*75-150*** (Wmps3s1l2-1; Wmps3s1l2-3; Wmps3s1l2-5)
B	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***csm4*Δ** (W303csm4); ***swr1Δcsm4*Δ** (W303csm4s1-1)
C	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1*Δ** (W303src1-9C); ***swr1Δ src1*Δ** (W303src1s1-1)
D	**wt** (WNUP49che-3); ***swr1Δ*** (Ws1NUP49che-1; Ws1NUP49che-4)
Figure4A	**wt** (BY4741); ***swr1Δ*** (Y03693); ***swc5Δ*** (Y03371); ***swr1Δswc5Δ*** BYs1s5-1
B	**wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)
C	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***cdc42-6*** (Wc42-9a; Wc42-6b); ***swr1Δcdc42-6*** (Ws1c42R5-2A; Ws1c42R5-2B; Ws1c42R5-4B)
D	**wt** (WACT1-1D; WACT1-2A); ***swr1Δ*** (WACT1s1-1C; WACT1s1-3C); ***act1-157*** (Wact1-157-2B; Wact1-157-9A); ***swr1Δact1-157*** (Wact1-157s1-1A; Wact1-157s1-3A); ***act1-159*** (Wact1-159-2A; Wact1-159-6A); ***swr1Δact1-159*** (Wact1-159s1-1B; Wact1-159s1-4B; Wact1-159s1-6B)
Figure5A	**wt** (WMPS3-2D); ***swr1Δ*** (WMPS3s1-5C); ***mps3*Δ*75-150*** (Wmps3-1C); ***swr1Δmps3*Δ*75-150*** (Wmps3s1-1A)
B	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1*Δ** (W303src1-9C); ***swr1Δ src1*Δ** (W303src1s1-1); ***cdc42-6*** (Wc42-6b) ; ***swr1Δcdc42-6*** (Ws1c42R5-2A); ***csm4*Δ** (W303csm4); ***swr1Δcsm4*Δ** (W303csm4s1-1)
C	**wt** (WACT1-1D; WACT1-2A); ***swr1Δ*** (WACT1s1-1C; WACT1s1-3C); ***act1-157*** (Wact1-157-2B; Wact1-157-9A); ***swr1Δact1-157*** (Wact1-157s1-1A; Wact1-157s1-3A); ***act1-159*** (Wact1-159-2A; Wact1-159-6A); ***swr1Δact1-159*** (Wact1-159s1-1B; Wact1-159s1-4B; Wact1-159s1-6B)
D	**wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)
E	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
Figure6A	**wt** (WMPS3-2D); ***swr1Δ*** (WMPS3s1-5C); ***mps3*Δ*75-150*** (Wmps3-1C); ***swr1Δmps3*Δ*75-150*** (Wmps3s1-1A)
B	**wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)

C	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1***Δ (W303src1-9C); ***swr1Δ src1***Δ (W303src1s1-1); ***cdc42-6*** (Wc42-6b) ; ***swr1Δcdc42-6*** (Ws1c42R5-2A)
D	**wt** (WACT1-1D; WACT1-2A); ***swr1Δ*** (WACT1s1-1C; WACT1s1-3C); ***act1-159*** (Wact1-159-2A; Wact1-159-6A); ***swr1Δact1-159*** (Wact1-159s1-4B; Wact1-159s1-6B)
E	**wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)
FigureS1B	**wt** (PJ69-4A); ***htz1***Δ (508h1); ***swr1Δ htz1Δ*** (5078h1s1)
C	**wt** (PJ69-4A); ***swr1Δ*** (507s1); ***swr1Δ htz1Δ*** (5078h1s1)
D	**wt** (PJ69-4A); ***htz1***Δ (508h1)
E	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***mps3***Δ***75-150src1***Δ (Wmp3sr1-3a); ***swr1Δ mps3***Δ***75-150src1***Δ (Wmp3sr1s1-3c)
FigureS2A	**wt** (W303-1aR5; W303-1bR5); ***htz1***Δ (W303h1); ***swr1Δ*** (W303s1-3A; W303s1); ***swr1Δ htz1Δ*** (W303h1s1-1A; W303h1s1-3C; W303h1s1-1C)
B	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***swc5Δ*** (Wswc5Δ-1; Wswc5Δ-2); ***swr1Δ swc5Δ*** (Ws1s5-4b; Ws1s5-5c)
C	BY4741
D	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***crn1Δ*** (Wcrn1-1B; Wcrn1-2A); ***swr1Δcrn1Δ*** (Ws1crn1-1; Ws1crn1-2)
E	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A)
F	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***cdc42-6*** (Wc42-6b); ***swr1Δcdc42-6*** (Ws1c42R5-2A)
FigureS3A	**wt** (BY4741); ***htz1***Δ (Y01703); ***swr1Δ*** (Y03693); ***swc5Δ*** (Y03371); ***swc2Δ*** (Y04319)
B	**wt** (WMPS3-2D); ***swr1Δ*** (WMPS3s1-5C); ***mps3***Δ***75-150*** (Wmps3-1C); ***swr1Δmps3***Δ***75-150*** Wmps3s1-1A; **wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1***Δ (W303src1-9C); ***swr1Δ src1***Δ (W303src1s1-1); ***cdc42-6*** (Wc42-6b) ; ***swr1Δcdc42-6*** (Ws1c42R5-2A); ***csm4***Δ (W303csm4); ***swr1Δcsm4***Δ (W303csm4s1-1); **wt** (WACT1-1D; WACT1-2A); ***swr1Δ*** (WACT1s1-1C; WACT1s1-3C); ***act1-157*** (Wact1-157-2B; Wact1-157-9A); ***swr1Δact1-157*** (Wact1-157s1-1A; Wact1-157s1-3A); ***act1-159*** (Wact1-159-2A; Wact1-159-6A); ***swr1Δact1-159*** (Wact1-159s1-1B; Wact1-159s1-4B; Wact1-159s1-6B); **wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)
C	**wt** (BY4741); ***htz1***Δ (Y01703); ***swr1Δ*** (Y03693); ***swc5Δ*** (Y03371); ***swc2Δ*** (Y04319)
D	**wt** (WACT1-1D; KAY159); ***act1-159*** (Wact1-159-2A; KAY375)
FigureS4A	**wt** (WMPS3-2D); ***mps3***Δ***75-150*** (Wmps3-1C);
B	**wt** (W303-1aR5); ***src1***Δ (W303src1-9C)
C	**wt** (WMPS3-2D); ***mps3***Δ***75-150src1***Δ (Wmp3sr1-3a)
D	**wt** (BY4741); ***swc5Δ*** (Y03371)
E	**wt** (BY4741); ***crn1Δ*** (Y06032)
F	**wt** (W303-1aR5); ***cdc42-6*** (Wc42-6b)
G	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***crn1Δ*** (Wcrn1-1B; Wcrn1-2A); ***swr1Δcrn1Δ*** (Ws1crn1-1; Ws1crn1-2)
H	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***swr1Δ src1***Δ (W303src1s1-1); ***swr1Δcdc42-6*** (Ws1c42R5-2A)
FigureS5	**wt** (WMPS3l2-3D); ***swr1Δ*** (WMPS3s1l2-12); ***mps3***Δ***75-150*** (Wmps3l2-3B); ***swr1Δ mps3***Δ***75-150*** (Wmp3s1l2-1-1.2; Wmp3s1l2-3-1.2) **wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1***Δ (W303src1-9C); ***swr1Δ src1***Δ (W303src1s1-1); ***csm4***Δ (W303csm4); ***swr1Δcsm4***Δ (W303csm4s1-1) **wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***cdc42-6*** (Wc42-6b); ***swr1Δcdc42-6*** (Ws1c42R5-2A) **wt** (WACT1-1D); ***swr1Δ*** (WACT1s1-1C); ***act1-157*** (Wact1-157-2B); ***swr1Δact1-157*** (Wact1-157s1-1A); ***act1-159*** (Wact1-159-2A); ***swr1Δact1-159*** (Wact1-159s1-1B) **wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-1)
FigureS6	**wt** (WMPS3l2-3D); ***swr1Δ*** (WMPS3s1l2-12); ***mps3***Δ***75-150*** (Wmps3l2-3B); ***swr1Δ mps3***Δ***75-150*** (Wmp3s1l2-3-1.2) **wt** (BY4741); ***swr1Δ*** (Y03693); ***crn1Δ*** (Y06032); ***swr1Δcrn1Δ*** (BYcrn1s1-12; BYcrn1s1-24) **wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***cdc42-6*** (Wc42-6b) ; ***swr1Δcdc42-6*** (Ws1c42R5-2A) **wt** (WACT1-1D; WACT1-2A); ***swr1Δ*** (WACT1s1-1C; WACT1s1-3C); ***act1-157*** (Wact1-157-2B; Wact1-157-9A); ***swr1Δact1-157*** (Wact1-157s1-1A; Wact1-157s1-3A); ***act1-159*** (Wact1-159-2A; Wact1-159-6A); ***swr1Δact1-159*** (Wact1-159s1-1B; Wact1-159s1-4B; Wact1-159s1-6B); **wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***src1***Δ (W303src1-9C); ***swr1Δ src1***Δ (W303src1s1-1);

	***csm4*Δ** (W303csm4); ***swr1Δcsm4*Δ** (W303csm4s1-1);
FigureS7A	**wt** (BY4733); ***swr1Δ*** (BY33s1); ***ino80Δ*** (GA-2264); ***swr1Δ ino80Δ*** (BY33i80s1)
B	**wt** (W303-1aR5); ***swr1Δ*** (W303s1-3A); ***scc1-73*** (Wscc1-73-2c; Wscc1-73-7b); ***swr1Δscc1-73*** (Ws1scc1-73-1A; Ws1scc1-73-2D)

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