SUPPLEMENTAL INFORMATION

SUPPLEMENTAL Table 1. Yeast strains used in this study.

Strains	Genotype
HY1279	*his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2 ::KAN*
HY1294C	*arg4-Nsp, ura3, leu2, his4, lys2, ho::LYS2/ura3::tetOx224::URA3, leu2::tetR-GFP::LEU2, lys2, ho::LYS2*
HY1336	*arg4-Nsp, ura3, lys2, ho::LYS2, DEC82-URA3-DED81, PCLB2-SCC2 ::KAN/ura3, lys2, ho::LYS2, arg4-Bgl, P_{CLB2}-SCC2 ::KAN*
HY1370	*ura3, leu2, his3, SCC2-3HA::HIS5/ura3, leu2, his3, SCC2-3HA::HIS5*
HY1499	*his4, leu2, spo11-Y135F::HB, REC8-3HA::URA3, lys2, ho::LYS2/his4, leu2, spo11-Y135F::HB, REC8-3HA::URA3, lys2, ho::LYS2*
HY1503C	*arg4, his4, leu2, REC8-3HA::URA3/leu2, REC8-3HA::URA3*
HY1586	*leu2, ura3, his4-x, trp1, REC8-3HA::URA3,P_{CLB2}-SCC2 ::KAN/leu2, ura3, his4-x, trp1, REC8-3HA::URA3, P_{CLB2}-SCC2 ::KAN*
HY1644	*leu2, SCC2-V5::HIS5, REC8-3HA::URA3, ndt80Δ::CLONAT, lys2, ho::LYS2/leu2, SCC2-V5::HIS5, REC8-3HA::URA3, ndt80Δ::CLONAT, lys2, ho::LYS2*
HY1750	*leu2, ura3, SMC3-3HA::HIS5, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, lys2, ho::LYS2*
HY1750C	*leu2, ura3, SMC3-3HA::HIS5, lys2, ho::LYS2 /his4, ura3, leu2, lys2, ho::LYS2*
HY1975	*leu2, REC8-3HA::URA3, spo11-Y135F::HB, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2/leu2, arg4, his4, REC8-3HA::URA3, spo11-Y135F::HB, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2*
HY2020	*arg4, leu2, SCC2-GFP::HIS5, REC8-3HA::URA3, lys2, ho::LYS2/arg4, leu2, SCC2-GFP::HIS5, REC8-3HA::URA3, lys2, ho::LYS2*
HY2107	*his4, ura3, leu2::PREC8-GFP::REC8, P_{CLB2}-SCC2 ::KAN/arg4-Nsp, ura3, leu2::PREC8-GFP::REC8, P_{CLB2}-SCC2 ::KAN*
HY2109	*his4, ura3, leu2::PREC8-GFP::LEU2, rec8Δ::KAN, lys2, ho::LYS2/arg4, ura3, leu2::P_{REC8}-GFP::LEU2, rec8Δ::Kan, lys2, ho::LYS2*
HY2113	*his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, lys2, ho::LYS2/ura3::tetOx224::URA3, leu2::tetR-GFP::LEU2, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2*
HY2115	*ura3::tetOx224::URA3, leu2::tetR-GFP::LEU2, P_{CLB2}-SCC2 ::CLONAT, ndt80Δ::HB, lys2, ho::LYS2/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, ndt80Δ::CLONAT, lys2, ho::LYS2*
HY2122	*leu2, ura3, his4, trp1, P_{CUP1}-REC8-3HA::URA3, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2/leu2, ura3, his4-x , trp1, P_{CUP1}-REC8-3HA::URA3, P_{CLB2}-SCC2 ::CLONAT, lys2, ho::LYS2*
HY2130	*ura3::tetOx224::URA3, leu2::tetR-GFP::LEU2, ndt80::HB/his4, ura3, leu2, ndt80::Kan*

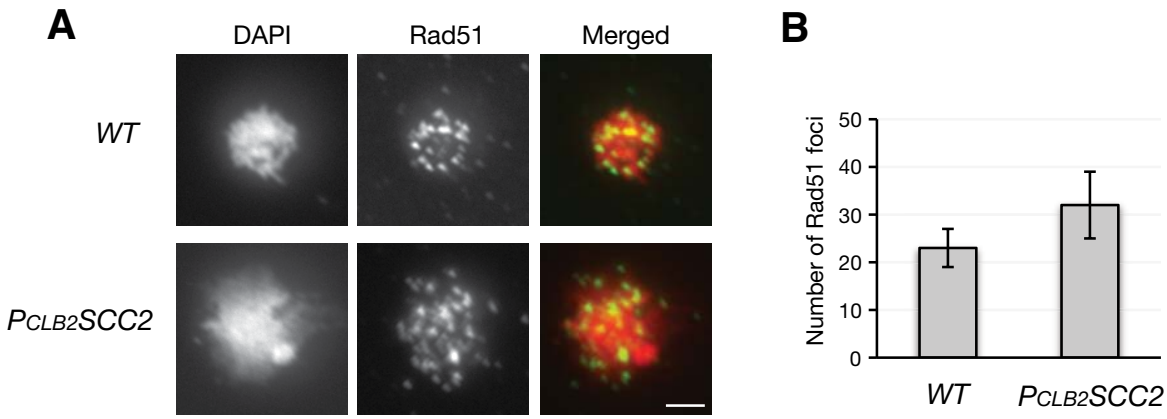
HY2157	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{REC8}-GFP::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{REC8}-GFP::LEU2*
HY2203	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{REC8}-GFP::REC8/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{REC8}-GFP::REC8*
HY2229	*his4, ura3, leu2, rec8Δ::Kan, leu2::P_{REC8}-GFP::LEU2/arg4-Nsp, ura3, leu2, rec8Δ::KAN, leu2::P_{REC8}-GFP::LEU2*
HY2279	*his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, PREC8-GFP::LEU2, lys2, ho::LYS2/arg4-Nsp, ura3, leu2,PCLB2-SCC2 ::KAN, P_{REC8}-GFP::LEU2, lys2, ho::LYS2*
HY2280	*his4-x, ura3, lys2, ho::LYS2, P_{REC8}-GFP::LEU2/arg4-Nsp, ura3, lys2, ho::LYS2, P_{REC8}-GFP::LEU2*
HY2285	*his4, ura3, P_{CLB2}SCC3::KAN, lys2, ho::LYS2, leu2::P_{REC8}-GFP::LEU2/arg4, ura3, lys2, ho::LYS2, P_{CLB2}SCC3::KAN, leu2::P_{REC8}-GFP::LEU2*
HY2301	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{REC8}-GFP::LEU2, P_{CLB2}-SCC2 ::KAN/his3Ä200, leu2-k, ura3, lys2, ho::LYS2, TUB4-mApple::HIS5, P_{REC8}-GFP::LEU2, P_{CLB2}-SCC2*
HY2464	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-GFP::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{DMC1}-GFP::LEU2*
HY2465	*arg4-Nsp, ura3, leu2,P_{CLB2}-SCC2 ::KAN, P_{DMC1}-GFP::LEU2/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, P_{DMC1}-GFP::LEU2*
HY2471	*leu2, ura3, SCC2-GFP::HIS5, rec8Δ::KAN/leu2, ura3, SCC2-GFP::HIS5, rec8Δ::KAN*
HY2500	*arg4-Nsp, ura3, leu2, P_{REC8}-MCD1::rec8Δ, lys2, ho::LYS2/his4, ura3, leu2, P_{REC8}-MCD1::rec8Δ, lys2, ho::LYS2*
HY2502	*arg4-Nsp, ura3, leu2,P_{CLB2}-SCC2 ::KAN, P_{REC8}-MCD1::rec8Δ, lys2, ho::LYS2/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, P_{REC8}-MCD1::rec8Δ, lys2, ho::LYS2*
HY2636	*arg4, ura3, leu2, P_{CLB2}SCC3::KAN, tetR-SCC3::URA3/his4, ura3, leu2, P_{CLB2}SCC3::KAN, tetR-SCC3::URA3*
HY2664	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, $P_{REC8\text{-}2158}$-GFP::LEU2*
HY2665	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, $P_{REC8\text{-}1297}$-GFP::LEU2*
HY2666	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, $P_{REC8\text{-}698}$-GFP::LEU2*
HY2684	*leu2, ura3, his4-x, REC8-3HA::URA3, P_{CLB2}-SCC2 ::NAT, 10xtetO-PREC8-GFP::LEU2/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, tetR-SCC3::URA3*
HY2685	*his4, ura3, leu2, PCLB2-SCC2 ::KAN/arg4-Nsp, ura3, leu2,P_{CLB2}-SCC2 ::KAN, 10xtetO-P_{REC8}-GFP::LEU2*
HY2692	*his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN, tetR-SCC3::URA3/arg4-Nsp, ura3, leu2,PCLB2-SCC2 ::KAN, P_{REC8}-GFP::LEU2*
HY2930	*leu2, ura3, his4-x, trp1, KAN::P_{DMC1}-REC8-3HA::URA3, P_{CLB2}-SCC2 ::NAT/his4, ura3, leu2, P_{CLB2}-SCC2 ::KAN*
HY2931	*leu2, ura3, his4-x, trp1, KAN:P_{DMC1}-REC8-3HA::URA3/leu2-k, arg4-*

	Nsp, ura3
HY2952	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/his3Ä200, leu2-k, ura3, lys2, ho::LYS2, P_{REC8}-GFP::bud3::HIS5*
HY2953	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{REC8}-GFP::dcc1::LEU2*
HY3044	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{DMC1}-mApple::LEU2/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2::KAN, 10xtetO-P_{REC8}-GFP::LEU2*
HY3045	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{URA3}-tetR-SCC3::URA3, P_{DMC1}-mApple::LEU2/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2::KAN, 10xtetO-P_{REC8}-GFP::LEU2*
HY3046	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{DMC1}-mApple::LEU2/arg4-Nsp, ura3, leu2,P_{CLB2}-SCC2::KAN, P_{REC8}-GFP::DCC1, 10xtetO::LEU2*
HY3047	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{URA3}-tetR-SCC3::URA3, P_{DMC1}-mApple::LEU2/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{REC8}-GFP::DCC1, 10xtetO::LEU2*
HY3100	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{DMC1}-mApple::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, 10xtetO-P_{REC8}-GFP::LEU2*
HY3214	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{HIM1}-GFP::HIM1/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{HIM1}-GFP::HIM1*
HY3215	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{HIM1}-GFP::HIM1/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{HIM1}-GFP::HIM1*
HY3231	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{HIM1}-GFP::LEU2/leu2-k, arg4-Nsp, ura3, lys2, ho::LYS2, P_{HIM1}-GFP::LEU2*
HY3233	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{HIM1}-GFP::LEU2/arg4-Nsp, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{HIM1}-GFP::LEU2*
HY3243	*his4-x, ura3, lys2, ho::LYS2, leu2::hisG, P_{CLB2}-SMC1::KAN, P_{URA3}-tetR-SCC3::URA3/his3Ä200, leu2-k, ura3, lys2, ho::LYS2, P_{CLB2}-SMC1::KAN, 10xtetO-P_{REC8}-GFP::LEU2*
HY3254	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN, P_{URA3}-tetR-SCC3::URA3/leu2, ura3, his4-x trp1, 10xtetO-REC8-3HA::URA3, P_{CLB2}-SCC2::KAN*
HY3255	*his4, ura3, leu2, P_{CLB2}-SCC2::KAN//leu2, ura3, his4-x, trp1, 10xtetO-REC8-3HA::URA3, P_{CLB2}-SCC2::KAN*
HY3284	*arg4, leu2-k, ura3, lys2, ho::LYS2, P_{CLB2}-SMC1::KAN/his3Ä200, leu2-k, ura3, lys2, ho::LYS2, P_{CLB2}-SMC1::KAN, 10xtetO-P_{REC8}-GFP::LEU2*
HY1869 (S288C)	*MATa, ura3, leu2, his3, TDEGRON-SCC2-V5::HIS5*
3050	*arg4-Nsp, ura3, leu2, SCC2-3HA::KAN/his4, ura3, leu2, SCC2-3HA::KAN*
3200	*arg4, ura3, leu2, P_{CLB2}-SCC3::KAN/his4, ura3, leu2, P_{CLB2}-SCC3::KAN*
3220	*his4, ura3, leu2, rec8Ä::HB/arg4, ura3, leu2, rec8Ä::HB*
NH144	*arg4-Nsp, ura3, leu2, lys2, ho::LYS2/his4, ura3, leu2, lys2, ho::LYS2*

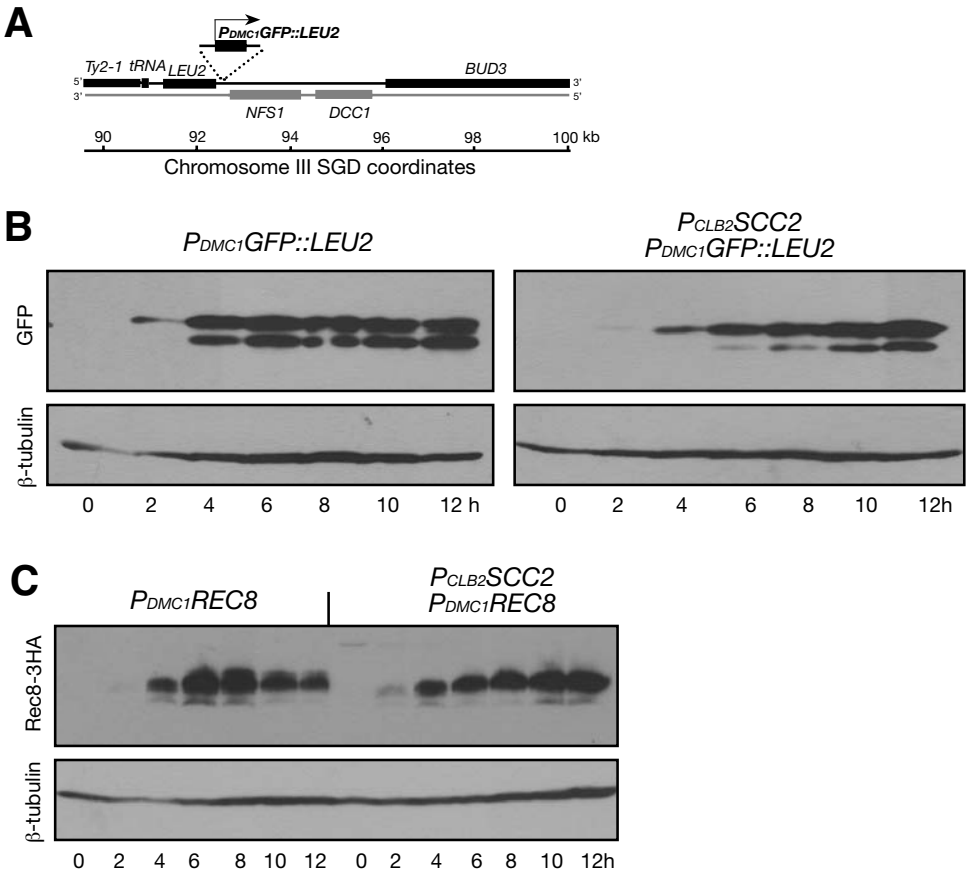
Supplemental Table 2. PCR primers used in this study.

Primer name	Primer sequence
SCC2-TAGF1	*CATCAAATGGCAAGCTTCTTACATATTTTAGAAAACACGTGAAGGATAC GGCGGCCGCTCTAGAACTAGTAG*
SCC2-TAGR1	*AATGCAAAATGATTATTAATACTATGTATATTTTAAGTGCAATATATTTAT CGACGGTATCGATAAGCTTC*
P_{CLB2}-SCC2F1	*GTATTGTTCTTATAACTATTCATTTTTTGAAAGAATTGGCGCTAGCAGC ATAGGCCACTAGTGGATCTG*
P_{CLB2}-SCC2R1	*CCTCTATTATTCTTCCAGGAATATTCTTGTCTTTCCCTGGGTACGACAT AGCAGCGTAATCTGGAACGTC*
ndt80ΔF1	*GATGGCACCACTTCGAATTATTTCGACAAAAGGAAACTAAAAATTGCC CCTCAGGGGCATGATGTGACT*
ndt80ΔR1	*GAAAGGGAGAGTTCGTTACCATAGCTTGTTTTGCATTCAGAACGTGAG CAGCTCGTTTTCGACACTGGAT*
REC8PROBEF1	*AATCACCTGCTTGTGCAGTT*
REC8PROBER1	*TCTTCCAAAACTTGAAGGAGG*
IME1PROBEF1	*CAAAATTGCCTCATCTCAGC*
IME1PROBER1	*TCAACGTCGAAGGCAATTTC*
ACT1PROBEF1	*TTTCTCCACCACTGCTGAAA*
ACT1PROBER1	*TCATGGAAGATGGAGCCAAA*
SCC2PROBEF1	*CAACGACAATTCTTCCAACAA*
SCC2PROBER1	*TTCATCAGCAAGTCGCTAAAG*
DEGRON-SCC2F1	*GTATTGTTCTTATAACTATTCATTTTTTGAAAGAATTGGCGGCTAGCAA TGCTTCCGGCTCGTATGTT*
DEGRON-SCC2R1	*CCTCTATTATTCTTCCAGGAATATTCTTGTCTTTCCCTGGGTACGACAT GGTACCGTCTTTCTTCTCGT*
SMC3TAGF1	*AGAAGAAGCAATCGGATTCATTAGAGGTAGCAATAAATTCGCTGAAGT CGCCGCTCTAGAACTAGTGGA T*
SMC3TAGR1	*GTAAGCAAAACTGATATTTTTATATACAAATCGTTTCAAATATCTCTTAT CGACGGTATCGATAAGCTTC*
GFPPROBEF1	*TGGAGTTGTCCCAATTCTTG*
GRPPROBER1	*CCATCGCCAATTGGAGTATT*

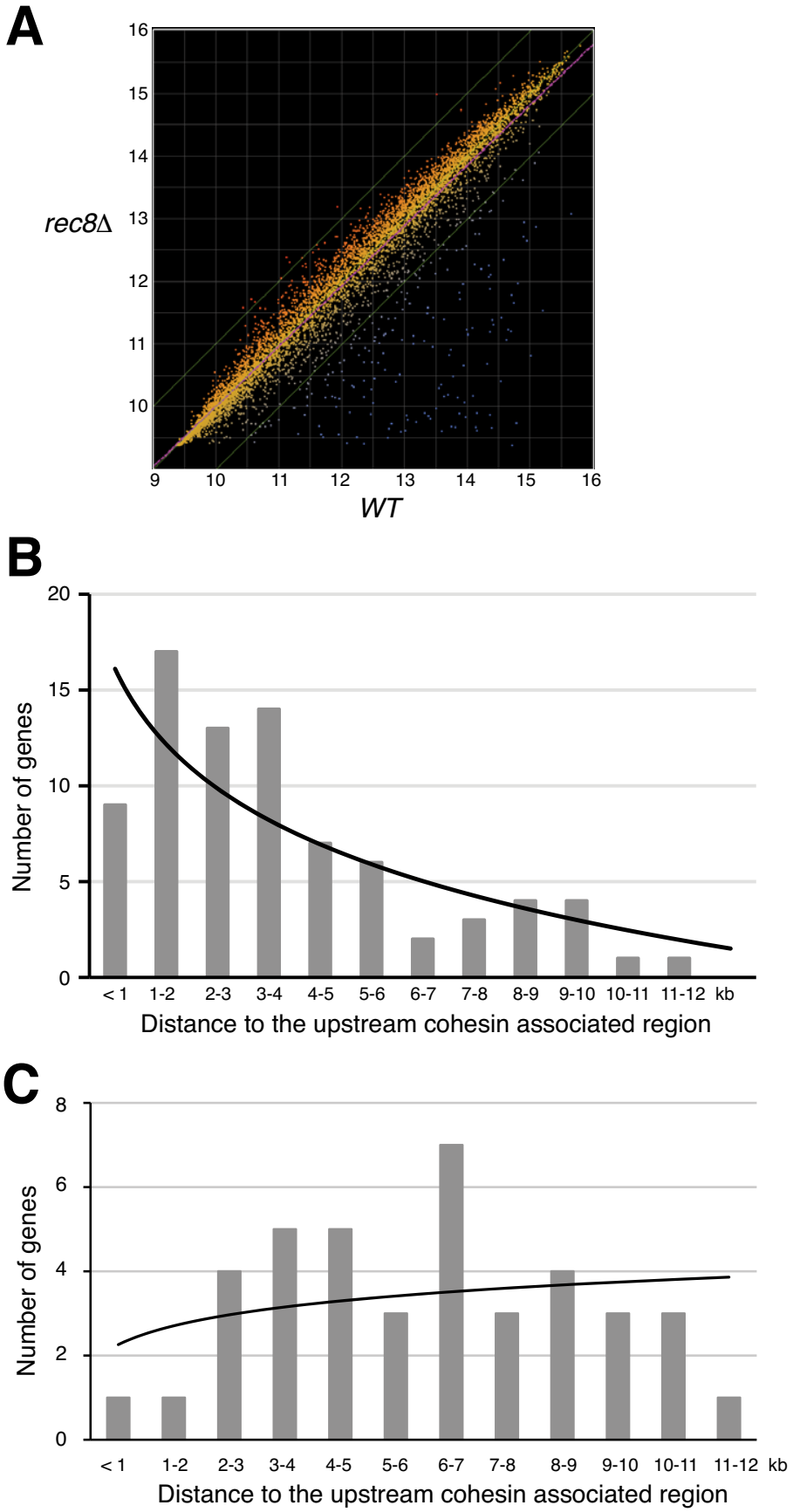
Supplemental Figure 1



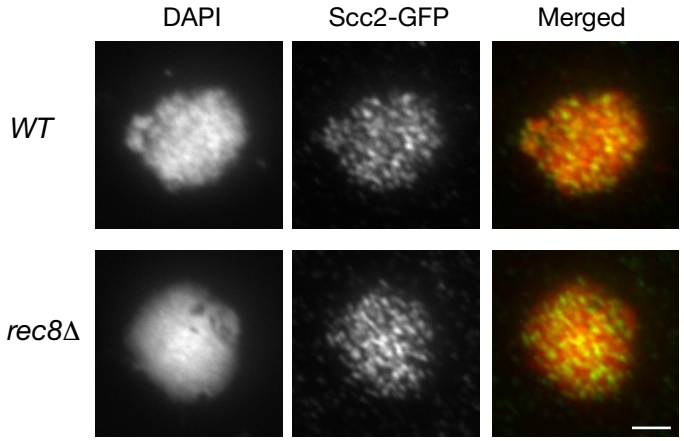
Supplemental Figure 2



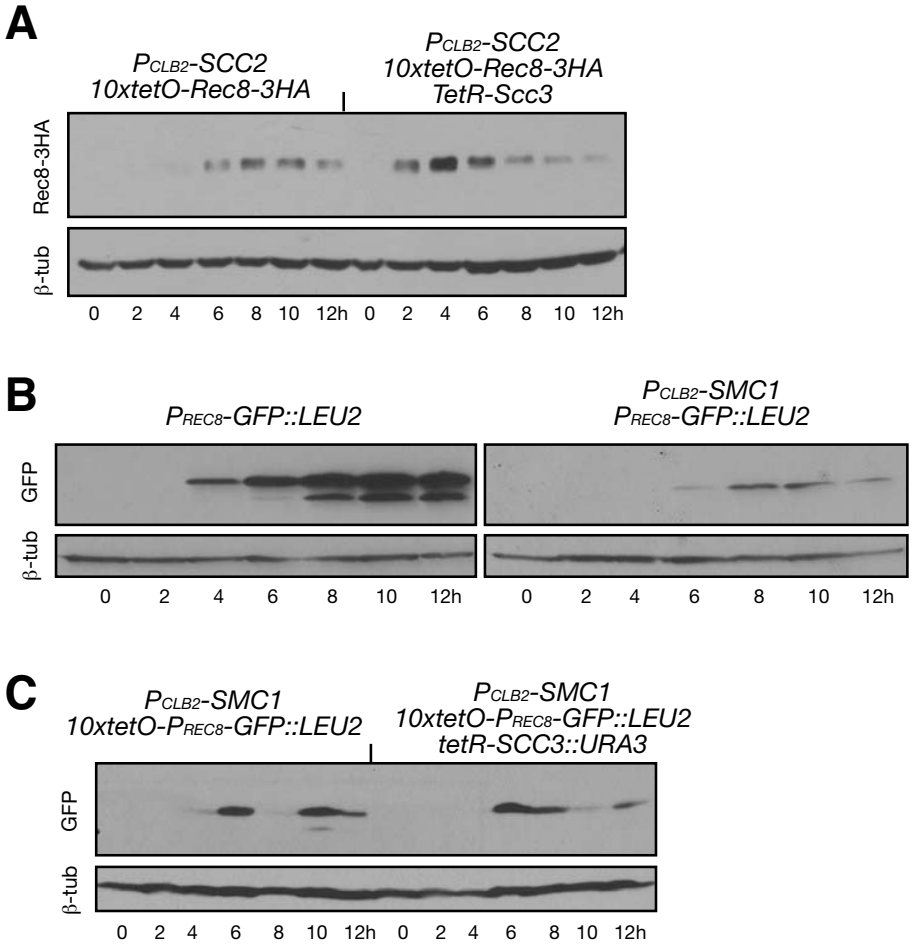
Supplemental Figure 3



Supplemental Figure 4



Supplemental Figure 5



Supplemental Figure 6