

Table S1. Yeast strains used in this study

Strain	Genotype	Figures	Source
YDS2	<i>W303 (leu2-3,112 trp1-1 can1-100 ura3-1 ade2-1 his3-11,15) MATa WT</i>	4A, 4B, 3C	Lab collection
OTA017	<i>12geneΔ0HSR (multidrug-sensitive yeast background) MATa</i>		(Chinen et al., 2011)
YMS1294 (5-1)	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4</i>	1B, 1D, 3A 3B, S3C	This study
YMS1299-13	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 tof1Δ::LEU2</i>	1B, 1D, 3A, 3B, S3C	This study
BY4741	<i>BY (MATa his3Δ1 leu2Δ0 met15Δ0 ura3Δ0) MATa WT</i>	1C, S1B, S1C	Lab collection
YMS1610	<i>BY MATa csm3Δ::KANMX</i>	1C, S1C	This study
YMS1266-I	<i>W303 MATa RDN1::ADE2::URA3::TRP1 tof1Δ::HPHMX4</i>	1C, 1E, S1B, S2A	This study
YMS909	<i>W303 MATa RDN1::ADE2 rrm3Δ::KANMX6</i>	1C, 1E	(Shyian et al., 2016)
YMS1282-1	<i>W303 MATa RDN1::ADE2 rrm3Δ::KANMX6 tof1Δ::HIS3MX6</i>	1C	This study
YSM266-4	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6</i>	1D	(Matarocci et al., 2014)
YMS1289-7	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 tof1Δ::LEU2</i>	1D	This study
YMS907	<i>W303 MATa RDN1::ADE2</i>	1E	(Shyian et al., 2016)
YMS908	<i>W303 MATa RDN1::ADE2 rif1Δ::NATMX4</i>	1E	(Shyian et al., 2016)
YMS910	<i>W303 MATa RDN1::ADE2 rif1Δ::NATMX4 rrm3Δ::KANMX6</i>	1E	(Shyian et al., 2016)
YMS1228	<i>W303 MATa RDN1::ADE2 rif1Δ::NATMX4 tof1Δ::HPHMX4</i>	1E	This study
YMS1224	<i>W303 MATa RDN1::ADE2 rrm3Δ::KANMX6 tof1Δ::HPHMX4</i>	1E	This study
YMS1226	<i>W303 MATa RDN1::ADE2 rrm3Δ::KANMX6 rif1Δ::NATMX4 tof1Δ::HPHMX4</i>	1E	This study
YMS912	<i>W303 MATa RDN1::ADE2 rif1Δ::NATMX4 rrm3Δ::KANMX6 fob1Δ::URA3</i>	1E	(Shyian et al., 2016)
YMS1227	<i>W303 MATa RDN1::ADE2 rrm3Δ::KANMX6 rif1Δ::NATMX4 tof1Δ::HPHMX4 fob1Δ::URA3</i>	1E	This study
YMS1605-2	<i>W303 MATalpha RDN1::ADE2</i>	2A	This study
YMS1606-2	<i>W303 MATalpha RDN1::ADE2 tof1Δ::HPHMX4</i>	2A	This study
YMS1607-2	<i>W303 MATalpha RDN1::ADE2 top1Δ::NATMX4</i>	2A	This study
YMS1608-2	<i>W303 MATalpha RDN1::ADE2 top1Δ::NATMX4 tof1Δ::HPHMX4</i>	2A	This study
YMS1505	<i>W303 MATa TOP1-13MYC::KANMX3</i>	2B, S2B, S2C	This study
YMS1506	<i>W303 MATa TOP1-13MYC::KANMX3 Tof1-TAP::HIS3</i>	2B, S2B	This study
YMS1507	<i>W303 MATa TOP1-13MYC::KANMX3 Tof1-TAP::HIS3 mrc1Δ::HPHMX4</i>	2B, S2B	This study
YMS1508	<i>W303 MATa TOP1-13MYC::KANMX3 Tof1-TAP::HIS3 csm3Δ::HPHMX4</i>	2B	This study
YMS1512	<i>W303 MATa TOP1-13MYC::KANMX3 Mrc1-TAP::HIS3</i>	2B, S2B	This study
YMS1513	<i>W303 MATa TOP1-13MYC::KANMX3 Mrc1-TAP::HIS3 tof1Δ::HPHMX4</i>	2B, S2B	This study
YMS1510	<i>W303 MATa TOP1-13MYC::KANMX3 Csm3-TAP::HIS3</i>	2B, 5A, S2C	This study
YMS1511	<i>W303 MATa TOP1-13MYC::KANMX3 Csm3-TAP::HIS3 tof1Δ::HPHMX4</i>	2B, 5A	This study
YMS1539-5	<i>W303 MATa RAD5+ bar1Δ Mcm4-3FLAG::KANMX TOP1-13MYC::HIS3MX4</i>	2C, 2D, S2D, S2E	This study
YMS1540-9	<i>W303 MATa RAD5+ bar1Δ Mcm4-3FLAG::KANMX TOP1-</i>	2C, 2D,	This study

	<i>13MYC::HIS3MX4 tof1Δ::LEU2</i>	S2D, S2E	
YMS1555-1	<i>W303 MATa RAD5+ bar1Δ Mcm4-3FLAG::KANMX TOP1-13MYC::HIS3MX4 mrc1Δ::LEU2</i>	2C, 2D, S2D	This study
YMS1542-19	<i>W303 MATa RAD5+ bar1Δ Mcm4-3FLAG::KANMX TOP1-13MYC::HIS3MX4 tof1Δ::LEU2 rrm3Δ::HPHMX4</i>	2C, 2D, S2D	This study
YMS1538	<i>W303 MATa RAD5+ bar1Δ TOP1-13MYC::HIS3MX4</i>	2E	This study
YMS1551-5	<i>W303 MATa RAD5+ bar1Δ TOP1-13MYC::HIS3MX4 TOF1-3FLAG::KANMX</i>	2E, 2F, S2F, S2G	This study
YMS1552-6	<i>W303 MATa RAD5+ bar1Δ TOP1-13MYC::HIS3MX4 tof1-Δ981-1238-3FLAG::KANMX</i>	2E, 2F, S2F, S2G	This study
YMS1449	<i>12geneΔ0HSR MATa</i>	3A, S3A	This study
YMS1638-5	<i>12geneΔ0HSR MATa TOF1-3FLAG::KANMX</i>	3A, S3A	This study
YMS1561-1	<i>12geneΔ0HSR MATa tof1Δ::LEU2</i>	3A, 5B, 5D, 5E, S5B	This study
YMS1639-4	<i>12geneΔ0HSR MATa tof1-Δ981-1238-3FLAG::KANMX</i>	3A, S3A	This study
YMS1563-1	<i>12geneΔ0HSR MATa top1Δ::KANMX6</i>	3A, S3A, S5B	This study
YMS1646-8	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 TOF1-3FLAG::KANMX</i>	3A, 3B, S3A, 3B, S3C	This study
YMS1647-12	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 tof1-Δ981-1238-3FLAG::KANMX</i>	3A, 3B, S3A, S3C	This study
YMS1644-1	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 TOF1-3FLAG::KANMX</i>	3B, S3C	This study
YMS1645-4	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 tof1-Δ981-1238-3FLAG::KANMX</i>	3B, S3C	This study
YMS1676-13	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 TOF1-3FLAG::KANMX top1Δ::NATMX4</i>	3B, S3C	This study
YMS1677-15	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 tof1-Δ981-1238-3FLAG::KANMX top1Δ::NATMX4</i>	3B, S3C	This study
YMS1673-7	<i>W303 MATa RAD5+ bar1Δ MCM4-13MYC::HIS3MX6 rrm3Δ::HPHMX4 tof1Δ::LEU2 top1Δ::NATMX4</i>	3B, S3C	This study
YMS1457	<i>W303 MATalpha top2-ts</i>	4A, 4B	This study
YMS1465	<i>W303 MATa top1Δ::NATMX4 top2-ts</i>	4A, 4B	This study
YMS1637-1	<i>W303 MATalpha top2-ts tof1-Δ981-1238-3FLAG::KANMX</i>	4A, 4B	This study
YMS1692	<i>W303 MATa top2-ts top1Δ::NATMX4 bar1Δ::LEU2</i>	4C	This study
YMS1689	<i>W303 MATa top2-ts tof1-Δ981-1238-3FLAG::KANMX rif1::NATMX4 RDN1::ADE2 bar1Δ::LEU2</i>	4C	This study
YMS1640-7	<i>W303 MATalpha TOP2-AID*-9myc::hphB URA3::TIR1 Csm3-TAP::HIS3 TOF1-3FLAG::KANMX</i>	5A, S4G	This study
YMS1641-8	<i>W303 MATalpha TOP2-AID*-9myc::hphB URA3::TIR1 Csm3-TAP::HIS3 tof1-Δ981-1238-3FLAG::KANMX</i>	5A, S4G	This study
YMS1559-1	<i>12geneΔ0HSR MATa WT</i>	5B, 5D, 5E, S5B	This study
YMS1707-1	<i>12geneΔ0HSR MATa TOF1-3FLAG::KANMX</i>	5B, 5E	This study
YMS1708-1	<i>12geneΔ0HSR MATa tof1-Δ981-1238-3FLAG::KANMX</i>	5B, 5D, 5E	This study
YMS1712	<i>W303 MATa rad9Δ::SpHIS5</i>	5B, 5C	This study
YMS1713	<i>W303 MATa rad9Δ::SpHIS5 TOF1-3FLAG::KANMX</i>	5B, 5C	This study
YMS1714	<i>W303 MATa rad9Δ::SpHIS5 tof1-Δ981-1238-3FLAG::KANMX</i>	5B, 5C	This study
YMS1715	<i>W303 MATa rad9Δ::SpHIS5 tof1Δ::KANMX4</i>	5B, 5C	This study
YMS419-4	<i>W303 MATa RAD5+ bar1Δ SLD3-13MYC::HIS3MX6</i>	5C	(Shyian et al., 2016)
YMS493	<i>W303 MATa RAD5+ bar1Δ SLD3-13MYC::HIS3MX6 sml1Δ::HPHMX4 mec1Δ::KANMX6</i>	5C	(Shyian et al., 2016)
YMS1560-1	<i>12geneΔ0HSR MATa mrc1Δ::LEU2</i>	5D, 5E, S5B	This study
YMS1709-1	<i>12geneΔ0HSR MATa mrc1Δ::LEU2 TOF1-3FLAG::KANMX</i>	5E	This study
YMS1710-1	<i>12geneΔ0HSR MATa mrc1Δ::LEU2 tof1-Δ981-1238-3FLAG::KANMX</i>	5D, 5E	This study

YMS1711-1	<i>12geneΔOHSR MATa mrc1Δ::LEU2 tof1Δ::LEU2</i>	5D, 5E	This study
YMS1024-1	<i>W303 MATa URA3::BrdU-Inc fob1Δ::KANMX6</i>	S1B	(Shyian et al., 2016)
YMS1609	<i>BY MATa tof1Δ::KANMX</i>	S1B	This study
YMS598-2	<i>W303 MAT alpha mrc1Δ::HPHMX4</i>	S1B	This study
YMS1611	<i>BY MATa ctf4Δ::KANMX</i>	S1B	This study
YMS1612	<i>BY MATa chl1Δ::KANMX</i>	S1B	This study
YMS1613	<i>BY MATa ctf18Δ::KANMX</i>	S1B	This study
YMS1403-14	<i>W303 MATa OsTIR1::URA3 SMC1-AID*-9myc::hphB</i>	S1B	This study
YMS1614	<i>BY MATa tof2Δ::KANMX</i>	S1C	This study
YMS1615	<i>BY MATa lrs4Δ::KANMX</i>	S1C	This study
YMS1616	<i>BY MATa nur1Δ::KANMX</i>	S1C	This study
YMS1617	<i>BY MATa heh1Δ::KANMX</i>	S1C	This study
YMS1618	<i>BY MATa heh2Δ::KANMX</i>	S1C	This study
YMS461-2	<i>W303 MATa RAD5+ bar1Δ CDC45-13MYC::HIS3MX6</i>	S1D	This study
YMS1288-3	<i>W303 MATa RAD5+ bar1Δ CDC45-13MYC::HIS3MX6 tof1Δ::LEU2</i>	S1D	This study
YMS1293 (4-1)	<i>W303 MATa RAD5+ bar1Δ CDC45-13MYC::HIS3MX6 rrm3Δ::HPHMX4</i>	S1D	This study
YMS1298-7	<i>W303 MATa RAD5+ bar1Δ CDC45-13MYC::HIS3MX6 rrm3Δ::HPHMX4 tof1Δ::LEU2</i>	S1D	This study
YMS1264-E	<i>W303 MATa RDN1::ADE2::URA3::TRP1 WT</i>	S2A	This study
YMS465-1	<i>W303 MATa mre11Δ::HPHMX4</i>	3C	(Shyian et al., 2016)
YMS467-1	<i>W303 MATa mre11Δ::HPHMX4 rif1Δ::NATMX4</i>	3C	(Shyian et al., 2016)
YMS1703	<i>W303 MATalpha mre11Δ::HPHMX4 rif1Δ::NATMX4 tof1-Δ981-1238-3FLAG::KANMX</i>	3C	This study
YMS1704	<i>W303 MATalpha mre11Δ::HPHMX4 rif1Δ::NATMX4 tof1::KANMX6</i>	3C	This study
YMS1481	<i>W303 MATalpha Top1-MYC::KANMX3</i>	S4A	This study
YMS1482-3	<i>W303 MATalpha Top1-MYC::KANMX3 TOF1-TAP::HIS3</i>	S4A	This study
YMS1483-8	<i>W303 MATalpha Top1-MYC::KANMX3 CSM3-TAP::HIS3</i>	S4A	This study
YMS1485	<i>W303 MATalpha TOP2-3FLAG::KANMX</i>	S4A	This study
YMS1486-5	<i>W303 MATalpha TOP2-3FLAG::KANMX TOF1-TAP::HIS3</i>	S4A	This study
YMS1487-9	<i>W303 MATalpha TOP2-3FLAG::KANMX CSM3-TAP::HIS3</i>	S4A	This study
YMS1496.	<i>W303 MATa RAD5+ bar1Δ TOP2-AID*-9myc::hphB</i>	S4B	This study
YMS1553-9	<i>W303 MATa RAD5+ bar1Δ TOP2-AID*-9myc::hphB TOF1-3FLAG::KANMX</i>	S4B	This study
YMS1554-9	<i>W303 MATa RAD5+ bar1Δ TOP2-AID*-9myc::hphB tof1-Δ981-1238-3FLAG::KANMX</i>	S4B	This study
YDS3	<i>W303 MATalpha WT</i>	S4C	Lab collection
YMS1405	<i>W303 MATalpha OsTIR1::URA3 tof1Δ::LEU2</i>	S4C	This study
BEN3	<i>W303 MATa top1Δ::NATMX4</i>	S4C	This study
BEN16	<i>W303 MATa top2-ts</i>	S4C	This study
BEN10	<i>W303 MATa top2-ts top1Δ::NATMX4</i>	S4C	This study
BEN240	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP1-AID*-9myc::hphB</i>	S4D, S4F	This study
BEN237	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP2-AID*-9myc::hphB</i>	S4D	This study
BEN250	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP3-AID*-9myc::hphB</i>	S4D	This study
BEN242	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP2-AID*-9myc::hphB TOPI-aid(kanMX)</i>	S4D	This study
YMS1470	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP2-AID*-9myc::hphB TOP3-AID*-9myc::hphB</i>	S4D	This study
YMS1477	<i>MATa OsTIR1::URA3 HIS3+ ADE2+ TOP3-AID*-9myc::hphB TOPI-aid(kanMX)</i>	S4D	This study
YMS1687	<i>W303 MATa top2-ts bar1Δ::LEU2</i>	S4E	This study
YMS1691	<i>W303 MATa top2-ts bar1Δ::LEU2 tof1Δ::HPHMX4</i>	S4E	This study
YMS1459	<i>MATalpha OsTIR1::URA3 TOPI-aid(kanMX) TOP2-AID*-9myc::hphB</i>	S4F	This study

YMS1402-40	<i>W303 MATa OsTIR1::URA3 TOF1-AID*-9myc::hphB</i>	S4F	This study
YMS1635	<i>W303 MATalpha TOP2-AID*-9myc::hphB OsTIR1::URA3 Csm3-TAP::HIS3 top1Δ::NATMX4</i>	S4G	This study
YMS1643-11	<i>W303 MATalpha TOP2-AID*-9myc::hphB OsTIR1::URA3 Csm3-TAP::HIS3 tof1-Δ981-1238-3FLAG::KANMX top1Δ::NATMX4</i>	S4G	This study
BEN151	<i>W303 MATa tor1-1 fpr1Δ::NAT RPL13A-2XFKB12::TRP1 top1Δ::HISMx6 TOP2-FRB::KANMX6</i>	S4H	This study
YMS1460	<i>MATa OsTIR1::URA3 TOP1-aid(kanMX) TOP2-AID*-9myc::hphB</i>	S4H	This study
YMS1467	<i>W303 MATalpha OsTIR1::URA3 TOP1-aid(kanMX) TOP2-AID*-9myc::hphB rad53-K227A::KAN</i>	S4H	This study
YMS1468	<i>MATa OsTIR1::URA3 TOP1-aid(kanMX) TOP2-AID*-9myc::hphB rad9Δ::SpHIS5</i>	S4H	This study
YMS1559-2	<i>I2geneΔ0HSR MATalpha WT</i>	S5A	This study
YMS1560-2	<i>I2geneΔ0HSR MATalpha mrc1Δ::LEU2</i>	S5A	This study
YMS1561-2	<i>I2geneΔ0HSR MATalpha tof1Δ::LEU2</i>	S5A	This study
YMS1562-2	<i>I2geneΔ0HSR MATalpha csm3Δ::LEU2</i>	S5A	This study
YMS1563-2	<i>I2geneΔ0HSR MATalpha top1Δ::KANMX6</i>	S5A	This study
YMS1562-1	<i>I2geneΔ0HSR MATa csm3Δ::LEU2</i>	S5B	This study
YMS1564-1	<i>I2geneΔ0HSR MATa top1Δ::KANMX6 mrc1Δ::LEU2</i>	S5B	This study
YMS1565-1	<i>I2geneΔ0HSR MATa top1Δ::KANMX6 tof1Δ::LEU2</i>	S5B	This study
YMS1566-1	<i>I2geneΔ0HSR MATa top1Δ::KANMX6 csm3Δ::LEU2</i>	S5B	This study