

## SUPPLEMENTAL MATERIAL

**TABLE S1**

Yeast strains

Strain	Genotype	Reference
<i>RS453</i>	MAT a; <i>ade2-1; his3-11,15; ura3-52; leu2-3,112; trp1-1; can1-100; GAL+</i>	Serrano,R.
<i>ML8-9A</i> (W303/RAD5)	MAT a; <i>ADE2; BAR1; trp1-1; LYS2, RAD5, his3-11,15; leu2-3,112; ura3-1; can1-100</i>	this study
<i>BUR1-TAP</i>	MAT a; <i>ade2-1; his3-11,15; ura3-52; leu2-3,112; can1-100; GAL+; BUR1-CBP-TEV-protA::TRP1-KL</i>	this study
<i>BUR2-TAP</i>	MAT a; <i>ade2-1; his3-11,15; ura3-52; leu2-3,112; can1-100; GAL+; BUR2-CBP-TEV-protA::TRP1-KL</i>	this study
<i>RFA1-TAP</i>	MAT a; <i>ade2-1; his3-11,15; ura3-52; leu2-3,112; can1-100; GAL+; RFA1-CBP-TEV-protA::TRP1-KL</i>	this study
<i>PRT1-TAP</i>	MAT a; <i>ade2-1; his3-11,15; ura3-52; leu2-3,112; can1-100; GAL+; PRT1-CBP-TEV-protA::TRP1-KL</i>	this study
<i>BUR1</i> shuffle	MAT a; <i>his3; leu2; ura3; trp1; ade2; YPR161c::kanMX4</i>	this study
<i>RFA1</i> shuffle	MAT a; <i>ade2; his3; ura3; leu2; trp1; can1-100; GAL+; YAR007c::kanMX4</i>	this study
<i>BUR1 RFA1</i> shuffle	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS316-BUR1; pRS316-RFA1</i>	this study
<i>BUR1 RAD52</i> shuffle	Mat a; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4; YML032c::kanMX4</i>	this study
<i>RFA1-RFP</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-BUR1; pRS415-RFA1-RFP</i>	this study
<i>RFA1-RFP bur1-101</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-bur1-101; pRS415-RFA1-RFP</i>	this study
<i>RFA1-RFP bur1-104</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-bur1-104; pRS415-RFA1-RFP</i>	this study
<i>RFA1-RFP bur1-107</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-bur1-107; pRS415-RFA1-RFP</i>	this study
<i>RFA1-RFP bur1-124</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-bur1-124; pRS415-RFA1-RFP</i>	this study
<i>RFA1-RFP bur1-<math>\Delta</math>C</i>	MAT $\alpha$ ; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4YAR007c::kanMX4; pRS315-bur1<math>\Delta</math>C-TADH1; pRS415-RFA1-RFP</i>	this study
<i>bur1-101::LEU2</i>	MAT a; <i>ade2-1, his3-11,15, ura3-52,112, trp1-1, can1-100; bur1-101::LEU2</i>	this study
<i>bur1-104::LEU2</i>	MAT a; <i>ade2-1, his3-11,15, ura3-52,112, trp1-1, can1-100; bur1-104::LEU2</i>	this study

<i>bur1-107::LEU2</i>	MAT a; <i>ade2-1, his3-11,15, ura3-52,112, trp1-1, can1-100; bur1-107::LEU2</i>	this study
<i>bur1-124::LEU2</i>	MAT a; <i>ade2-1, his3-11,15, ura3-52,112, trp1-1, can1-100; bur1-124::LEU2</i>	this study
<i>BUR1 MSH6</i> shuffle	MAT α; <i>his3; leu2; ura3; trp1; ade2; YPR161c::kanMX4; YDR097c::kanMX4; pRS316-BUR1; pRS316-MSH6</i>	this study
<i>BUR1 POL4</i> shuffle	MAT a; <i>his3; leu2; ura3; trp1; ade2; YPR161c::kanMX4; YCR014c::kanMX4, pRS316-BUR1; pRS316-POL4</i>	this study
<i>BUR1 RAD16</i> shuffle	MAT α; <i>his3; leu2; ura3; trp1; ade2; YPR161c::kanMX4; YBR114w::kanMX4; pRS316-BUR1; pRS316-RAD16</i>	this study
<i>BUR1 RAD26</i> shuffle	MAT α; <i>his3; leu2; ura3; trp1; YJR035w::kanMX4; YPR161c::kanMX4; pRS316-BUR1; pRS316-RAD26</i>	this study
<i>BUR1 RAD16 rad26</i> shuffle	MAT α; <i>his3; leu2; ura3; trp1; YJR035w::kanMX4; YPR161c::kanMX4; YBR114w::HIS3; pRS316-BUR1; pRS316-RAD16</i>	this study
<i>bur1-107 XRS2</i> shuffle	MAT a; <i>his3; leu2; ura3; YDR369c::kanMX4; bur1-107::LEU2; pRS316-XRS2</i>	this study
<i>BUR1 APN1</i> shuffle	MAT a; <i>his3; leu2; ura3; YPR161c::kanMX4; YKL114c::kanMX4; pRS316-BUR1; pRS316-APN1</i>	this study
<i>BUR1 MAG1</i> shuffle	MAT α; <i>his3; leu2; ura3; trp1; YPR161c::kanMX4; YER142c::kanMX4; pRS316-BUR1; pRS316-MAG1</i>	this study
<i>BUR1 RNR1</i> shuffle	MAT a; <i>his3; leu2; ura3; trp1; ade2; YPR161c::kanMX4; YER070w::kanMX4; pRS316-BUR1; pRS316-RNR1</i>	this study
<i>Δsml1</i>	MAT α; <i>ADE2; BARI; trp1-1; lys2Δ; RAD5; sml1::HIS3; his3-11,15; leu2-3,112; ura3-1; can1-100</i>	this study
<i>NEB191-10B (Δmec1 Δsml1)</i>	MAT α; <i>ADE2; BARI; trp1-1; lys2Δ; RAD5; mec1::TRP1; sml1::HIS3; his3-11,15; leu2-3,112; ura3-1; can1-100</i>	this study
<i>Δsml1 bur1-107</i>	MAT α; <i>ADE2; BARI; trp1-1; lys2Δ; RAD5; sml1::HIS3; bur1-107::LEU2; his3-11,15; leu2-3,112; ura3-1; can1-100</i>	this study
<i>Δmec1 Δsml1 bur1-107</i>	MAT α; <i>ADE2; BARI; trp1-1; lys2Δ; RAD5; mec1::TRP1; sml1::HIS3; bur1-107::LEU2; his3-11,15; leu2-3,112; ura3-1; can1-100</i>	this study

**TABLE S2**

Plasmids

Plasmid	Description	Reference
pRS315- <i>BUR1</i>	a Sall-ScaI fragment of a genomic clone containing <i>BUR1</i> was cloned into the Sall and SmaI sites of pRS315	this study
pRS316- <i>BUR1</i>	a Sall-NotI fragment was subcloned from pRS315- <i>BUR1</i> into pRS316	this study

pRS315- <i>bur1-101</i>	as pRS315- <i>BURI</i> but carrying <i>bur1-101</i>	this study
pRS315- <i>bur1-104</i>	as pRS315- <i>BURI</i> but carrying <i>bur1-104</i>	this study
pRS315- <i>bur1-107</i>	as pRS315- <i>BURI</i> but carrying <i>bur1-107</i>	this study
pRS315- <i>bur1-124</i>	as pRS315- <i>BURI</i> but carrying <i>bur1-124</i>	this study
pRS313- <i>bur1-101</i>	as pRS313- <i>BURI</i> but carrying <i>bur1-101</i>	this study
pRS313- <i>bur1-104</i>	as pRS313- <i>BURI</i> but carrying <i>bur1-104</i>	this study
pRS313- <i>bur1-107</i>	as pRS313- <i>BURI</i> but carrying <i>bur1-107</i>	this study
pRS313- <i>bur1-124</i>	as pRS313- <i>BURI</i> but carrying <i>bur1-124</i>	this study
pRS314- <i>bur1-101</i>	as pRS314- <i>BURI</i> but carrying <i>bur1-101</i>	this study
pRS314- <i>bur1-104</i>	as pRS314- <i>BURI</i> but carrying <i>bur1-104</i>	this study
pRS314- <i>bur1-107</i>	as pRS314- <i>BURI</i> but carrying <i>bur1-107</i>	this study
pRS314- <i>bur1-124</i>	as pRS314- <i>BURI</i> but carrying <i>bur1-124</i>	this study
pRS314- <i>RFAI</i>	<i>RFAI</i> (including ~500 bp 5' and ~130 bp 3') was amplified from genomic DNA introducing BamHI and XhoI sites and cloned into the same sites of pRS314	this study
pRS316- <i>RFAI</i>	<i>RFAI</i> (including ~500 bp 5' and ~130 bp 3') was amplified from genomic DNA introducing BamHI and XhoI sites and cloned into the same sites of pRS316	this study
pRS314- <i>rfa1-249</i>	as pRS314- <i>RFAI</i> but carrying <i>rfa1-249</i>	this study
pRS15-T <sub>ADHI</sub>		(1)
pRS315-P <sub>BURI</sub> -T <sub>ADHI</sub>	the promoter sequence of <i>BURI</i> was PCR amplified from genomic DNA adding NotI and BamHI sites and cloned into the same sites of pRS315-T <sub>ADHI</sub>	this study
pRS315- <i>BURI</i> -T <sub>ADHI</sub>	the coding region of <i>BURI</i> was PCR amplified from genomic DNA adding BamHI and XhoI sites and cloned into the same sites of pRS315-P <sub>BURI</sub> -TAP-T <sub>ADHI</sub>	this study
pRS315- <i>bur1ΔC</i> -T <sub>ADHI</sub>	the sequence encoding the <i>BURI</i> kinase domain (aa 1 - 372) was PCR amplified from genomic DNA adding BamHI and XhoI sites and cloned into the same sites of pRS315-P <sub>BURI</sub> -T <sub>ADHI</sub>	this study
pRS315- <i>bur1-C</i> -T <sub>ADHI</sub>	the sequence encoding the <i>BURI</i> C terminus (aa 365 – 657) was PCR amplified from genomic DNA adding BamHI and XhoI sites and an ATG and cloned into the same sites of pRS315-P <sub>BURI</sub> -TAP-T <sub>ADHI</sub>	this study
pRS315-TAP-T <sub>ADHI</sub>		(1)
pRS315-P <sub>BURI</sub> -TAP-T <sub>ADHI</sub>	the promoter sequence of <i>BURI</i> was PCR amplified from genomic DNA adding NotI and BamHI sites and cloned into the same sites of pRS315-TAP-T <sub>ADHI</sub>	this study
pRS315- <i>BURI</i> -TAP-T <sub>ADHI</sub>	the coding region of <i>BURI</i> was PCR amplified from genomic DNA adding BamHI and XhoI sites and cloned into the same sites of pRS315-P <sub>BURI</sub> -TAP-T <sub>ADHI</sub>	this study
pRS315- <i>bur1-C</i> -TAP-T <sub>ADHI</sub>	the sequence encoding the <i>BURI</i> C terminus (aa 365 – 657) was PCR amplified from genomic DNA adding BamHI and XhoI sites and an ATG	this study

	and cloned into the same sites of pRS315-P <sub>BURI</sub> -TAP-T <sub>ADHI</sub>	
pRP1085		(2)
pRS415- <i>RFAI</i> -RFP	the promoter and coding region of <i>RFAI</i> was amplified by PCR creating HindIII and BamHI and cloned into the same sites of pRP1085	this study
pWJ1213	pRS413-based vector for expression of <i>RAD52-YFP</i> from its native promoter	(3)
pRS314- <i>RAD52</i>	<i>RAD52</i> (including ~540 bp 5' and ~130 bp 3') was amplified by PCR creating SacI and XhoI sites and cloned into the same sites of pRS315	this study
pRS316- <i>RAD52</i>	<i>RAD52</i> (including ~540 bp 5' and ~130 bp 3') was amplified by PCR creating SacI and XhoI sites and cloned into the same sites of pRS316	this study
pRS315- <i>MSH6</i>	<i>MSH6</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS315	this study
pRS316- <i>MSH6</i>	<i>MSH6</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS316	this study
pRS315- <i>POL4</i>	<i>POL4</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS315	this study
pRS316- <i>POL4</i>	<i>POL4</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS316	this study
pRS315- <i>RAD16</i>	<i>RAD16</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS315	this study
pRS316- <i>RAD16</i>	<i>RAD16</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI sites and cloned into the same sites of pRS316	this study
pRS315- <i>RAD26</i>	<i>RAD26</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating SalI and BamHI sites and cloned into the same sites of pRS315	this study
pRS316- <i>RAD26</i>	<i>RAD26</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating SalI and BamHI sites and cloned into the same sites of pRS316	this study
pRS313- <i>XRS2</i>	<i>XRS2</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating BamHI and SmaI sites and cloned into the BamHI site of pRS313	this study
pRS316- <i>XRS2</i>	<i>XRS2</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating BamHI and SmaI sites and cloned into the BamHI site pRS316	this study
pRS313- <i>APNI</i>	<i>APNI</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI and cloned into the same sites of pRS313	this study
pRS316- <i>APNI</i>	<i>APNI</i> (including ~500 bp 5' and ~300 bp 3') was PCR amplified creating XhoI and BamHI and cloned into the same sites of pRS316	this study
pRS315- <i>MAGI</i>	<i>MAGI</i> (including ~500 bp 5' and ~300 bp 3')	this study

pRS316- <i>MAG1</i>	was PCR amplified creating XhoI and BamHI and cloned into the same sites of pRS315 <i>MAG1</i> (including ~500 bp 5' and ~300 bp 3')	this study
pRS315- <i>RNR1</i>	was PCR amplified creating XhoI and BamHI and cloned into the same sites of pRS316 <i>RNR1</i> (including ~500 bp 5' and ~300 bp 3')	this study
pRS316- <i>RNR1</i>	PCR amplified creating XhoI and BamHI and cloned into the same sites of pRS315 <i>RNR1</i> (including ~500 bp 5' and ~300 bp 3')	this study
pGEX-4T-3- <i>bur1</i> -365-657	the sequence encoding the indicated amino acids of Bur1 were amplified by PCR creating BamHI and SalI sites and cloned into the same sites of pGEX-4T-3	this study
-365-500		
-365-480		
-413-500		
-540-657		
-560-657		
-500-570		

**Table S3**

ORFs whose transcripts change > 2-fold in *bur1-107* compared to wild-type strains after treatment with 0.1% MMS for 1 h

ORF	Gene	Fold	Function
YML123C	<i>PHO84</i>	-21,0	High-affinity inorganic phosphate (Pi) and low-affinity manganese transporter
YHR136C	<i>SPL2</i>	-10,7	Protein with similarity to cyclin-dependent kinase inhibitors
YJR025C	<i>BNA1</i>	-3,6	3-hydroxyanthranilic acid dioxygenase
YJL161W	–	-3,0	Putative protein of unknown function
YGL184C	<i>STR3</i>	-2,9	Cystathionine beta-lyase
YNL300W	–	-2,8	Glycosylphosphatidylinositol-dependent cell wall protein
YDR453C	<i>TSA2</i>	-2,6	Stress inducible cytoplasmic thioredoxin peroxidase
YNL277W	<i>MET2</i>	-2,6	L-homoserine-O-acetyltransferase
YMR095C	<i>SNO1</i>	-2,5	Protein of unconfirmed function
YGL121C	<i>GPG1</i>	-2,5	Proposed gamma subunit of the heterotrimeric G protein that interacts with the receptor Gpr1p
YGL263W	<i>COS12</i>	-2,5	Protein of unknown function
YGR044C	<i>RME1</i>	-2,4	Zinc finger protein involved in control of meiosis
YLR180W	<i>SAM1</i>	-2,4	S-adenosylmethionine synthetase
YJR078W	<i>BNA2</i>	-2,4	Tryptophan 2,3-dioxygenase
YOR236W	<i>DFR1</i>	-2,4	Dihydrofolate reductase
YGR256W	<i>GND2</i>	-2,4	6-phosphogluconate dehydrogenase
YDR281C	<i>PHM6</i>	-2,4	Protein of unknown function
YNL058C	–	-2,3	Putative protein of unknown function
YIR030C	<i>DCG1</i>	-2,3	Protein of unknown function
YKR075C	–	-2,3	Protein of unknown function
YGR108W	<i>CLB1</i>	-2,3	B-type cyclin involved in cell cycle progression

YMR174C	<i>PAI3</i>	-2,3	Cytoplasmic proteinase A (Pep4p) inhibitor Protein of unassigned function involved in mutation
YHL006C	<i>SHU1</i>	-2,2	suppression
YLR348C	<i>DIC1</i>	-2,2	Mitochondrial dicarboxylate carrier
YHR015W	<i>MIP6</i>	-2,2	Putative RNA-binding protein
YAL063C-A	–	-2,1	Putative protein of unknown function
YGR109C	<i>CLB6</i>	-2,1	B-type cyclin involved in DNA replication during S phase
YGR153W	–	-2,1	Putative protein of unknown function
YCL049C	–	-2,1	Protein of unknown function
YMR195W	<i>ICY1</i>	-2,1	Protein of unknown function
YPL256C	<i>CLN2</i>	-2,1	G1 cyclin involved in regulation of the cell cycle
YLR121C	<i>YPS3</i>	-2,1	Aspartic protease
YKL218C	<i>SRY1</i>	-2,1	3-hydroxyaspartate dehydratase
YGR203W	–	-2,1	Putative protein
YMR096W	<i>SNZ1</i>	-2,1	Protein involved in vitamin B6 biosynthesis
YDR126W	<i>SWF1</i>	-2,1	Palmitoyltransferase
YER091C	<i>MET6</i>	-2,1	Cobalamin-independent methionine synthase
YMR069W	<i>NAT4</i>	-2,1	N alpha-acetyl-transferase
YHL044W	–	-2,0	Putative integral membrane protein
YMR144W	–	-2,0	Putative protein of unknown function
YBR147W	–	-2,0	Putative protein of unknown function
YLR281C	–	-2,0	Putative protein of unknown function
YFL053W	<i>DAK2</i>	2,0	Dihydroxyacetone kinase
YER060W-A	<i>FCY22</i>	2,1	Putative purine-cytosine permease
YNR044W	<i>AGA1</i>	2,1	Anchorage subunit of a-agglutinin of a-cells
YJR004C	<i>SAG1</i>	2,3	Alpha-agglutinin of alpha-cells
YIL037C	<i>PRM2</i>	2,3	Pheromone-regulated protein
YML047C	<i>PRM6</i>	2,3	Pheromone-regulated protein
YNL145W	<i>MFA2</i>	2,3	Mating pheromone a-factor
YCL027W	<i>FUS1</i>	2,3	Membrane protein localized to the shmoo tip
YFL026W	<i>STE2</i>	2,4	Receptor for alpha-factor pheromone
YNL018C	–	2,4	Putative protein of unknown function
YKL070W	–	2,5	Putative protein of unknown function
YMR230W-A	–	2,6	Putative protein of unknown function
YBR040W	<i>FIG1</i>	2,6	Integral membrane protein required for efficient mating
YNL034W	–	2,8	Putative protein of unknown function
YNL279W	<i>PRM1</i>	2,9	Pheromone-regulated multispinning membrane protein
YGL032C	<i>AGA2</i>	2,9	Adhesion subunit of a-agglutinin of a-cells
YPR161C	<i>BUR1</i>	3,3	Cyclin (Bur2p)-dependent protein kinase
YDR461W	<i>MFA1</i>	4,5	Mating pheromone a-factor

## SUPPLEMENTAL REFERENCES

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