

Supplementary Table 1, Davierwala et al.

Gene	ORF	Essential?	Allele designation	Screening temperature	Source (Recent)	Citation	Source (previous)	Boone strain	TH strain	Primary GO Biological Process	Description
ACT1	YFL039C	Y	120	26°C	David Dubin	1	David Amberg	Y7235		structural constituent of cytoskeleton	Actin
ARP2	YOL020W	Y	14	35°C	Charlie Boone		Charlie Boone	16157	TH 6769	actin filament organization	Actin-related protein involved in endocytosis and membrane growth and polarity
BM1	YER010W	N	deletion	30°C	Charlie Boone		Charlie Boone	Y3304		mitotic spindle checkpoint	Microtubule-binding protein
BIN1	YNL271C	N	deletion	30°C	Charlie Boone		Charlie Boone	Y2927		establishment of cell polarity	Formin involved in cell processes
CDC12	YHR107C	Y	1	26°C	Eric Foss		Eric Foss	Y5274		cell wall organization and biogenesis	Component of the septin ring of the mother-bud neck that is required for cytokinesis
CDC40	YDR364C	ts	1	26°C	Jasper Rine		Jasper Rine	Y5065	TH 6575	nuclear mRNA splicing, via spliceosome	Protein required for the second catalytic step of mRNA splicing
CDC42	YLR229C	Y	1	35°C	George Sprague	2	George Sprague	Y5190	TH 6583	establishment of cell polarity	Small rho-like GTPase involved in bud site assembly, cell polarity, and exocytosis
CSH3	YMR048W	N	deletion	30°C	Charlie Boone		Charlie Boone	Y4460		DNA replication checkpoint	Protein required for accurate chromosome segregation during meiosis
DBP10	YDL031W	Y	not integrated in promoter	30°C	Tim Hughes		Tim Hughes	Y5022	TH 4603	35S primary transcript processing	Putative RNA helicase involved in ribosome biogenesis
ERG11	YHR007C	Y	DHFR-ts	26°C	Charlie Boone	3	Charlie Boone	Y4830		ergosterol biosynthesis	Cytochrome P450 lanosterol 14α-demethylase
EXO84	YBR102C	Y	102	26°C	Charlie Boone		Charlie Boone	Y7313		exocytosis	Subunit of the exocyst complex, required for pre-spliceosome formation and intron-dependent mRNA splicing
LRP1	YHR081W	N	slow-growing deletion	30°C	Tim Hughes		Jack Greenblatt	Y5987	TH 6682	double-strand break repair via nonhomologous end-joining	Like rRNA Processing protein involved in regulation of DNA repair and recombination
MRC1	YCL061C	N	deletion	30°C	Charlie Boone		Charlie Boone	Y4127		DNA replication checkpoint	Component of the replication fork required for the replication checkpoint during DNA replication stress
NIP7	YPL211W	Y	1	26°C	Tim Hughes		Tim Hughes (TH6762)	Y7185		RNA processing	Nucleolar protein required for efficient 60S ribosome subunit biogenesis
NOP1	YOL144W	Y	3	26°C	Tim Hughes		Tim Hughes	Y7316		RNA modification	Nucleolar protein required for processing of pre-18S rRNA
PRT1	YOR381C	Y	1	33°C	Leland Hartwell		Leland Hartwell	Y5192	TH 6577	translational initiation	Translation initiation factor eIF-3 beta subunit
RFC5	YBR087W	Y	1	30°C	Grant Brown		Grant Brown	Y5999	TH 6706	leading strand elongation	Subunit of replication factor C complex
RPA49	YNL248C	N	deletion	30°C	Charlie Boone		Charlie Boone	Y6303	TH 7079	transcription from Pol I promoter	RNA polymerase I third largest subunit
RPS17A	YML024W	N	deletion is slow-growing	30°C	Charlie Boone		Charlie Boone	Y6375	TH 7080	protein biosynthesis	Ribosomal protein S1 (rpS1) of the small (40S) subunit
SEC1	YDR164C	Y	1	33°C	Peter Novick	7	Peter Novick	Y5269	TH 6584	vesicle fusion	Hydrophilic protein involved at the late stage of secretion
SEC15	YGL233W	Y	1	35°C	Peter Novick	7	Peter Novick	Y5270	TH 6585	Golgi to plasma membrane transport	Component of exocyst complex required for exocytosis
SEC18	YBR090C	Y	1	26°C	Peter Novick	7	Peter Novick	Y6003	TH 6767	ER to Golgi transport	Cytoplasmic protein involved in protein transport between ER and Golgi
SEC7	YDR170C	Y	1	30°C	Peter Novick	7	Peter Novick	Y5502	TH 6580	ER to Golgi transport	Component of non-clathrin vesicle coat required for protein trafficking within the Golgi
SRB8	YBR253W	Y	not integrated in promoter	30°C	Tim Hughes		Tim Hughes	Y7225	TH 4622	transcription from Pol II promoter	Component of the RNA polymerase II holoenzyme and Kromberg's mediator (SRB) subcomplex
ARL3	YPL051W	N	deletion	30°C	Brenda Andrews	8	Charlie Boone	Y4851		intracellular protein transport	GTPase of the Ras superfamily required to recruit Arp1 to the Golgi, similar to ADP-ribosylation factor
SET2	YAL168C	N	deletion	30°C	Brenda Andrews	9	Charlie Boone	Y4409		regulation of transcription	Histone methyltransferase with a role in transcriptional elongation, methylates a lysine residue of histone H3
KRE1	YNL322C	N	deletion	30°C	Brenda Andrews	8	Charlie Boone	Y4695		cell wall organization and biogenesis	Cell wall glycoprotein involved in beta-glucan assembly, serves as a K1 killer toxin membrane receptor
SL12	YHR030C	N	deletion	30°C	Brenda Andrews	8	Charlie Boone	BY2329		cell wall organization and biogenesis	Protein kinase involved in cell wall organization and biogenesis
LOS1	YKL200W	N	deletion	30°C	Brenda Andrews		Anita Hopfer	Y4057		RNA-nucleus export	Nuclear pore protein involved in nuclear export of pre-rRNA
RAD50	YNL250W	N	deletion	30°C	Brenda Andrews	8	Charlie Boone	Y4253		double-strand break repair via nonhomologous end-joining	Subunit of MRX complex, with Mre1p and Xrs2p, involved in processing double-strand DNA breaks in vegetative cells, initiation of meiotic DSBs, telomere maintenance, and nonhomologous end joining

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3 Parsons AB, Brost RL, Ding H, Li Z, Zhang C, Sheikh B, Brown GW, Kane PM, Hughes TR, Boone C. 2004. Integration of chemical-genetic and genetic interaction data links bioactive compounds to cellular target pathways. *Nat Biotechnol.* 22(1):62-9

4 Zanchini NI, Roberts P, DeSilva A, Sherman F, Goldfarb DS. 1997. *Saccharomyces cerevisiae* Nip7p is required for efficient 60S ribosome subunit biogenesis. *Mol Cell Biol.* 17(9):5001-15

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6 Sugimoto K, Shimomura T, Hashimoto K, Araki H, Sugino A, Matsumoto K. 1996. Rfc5, a small subunit of replication factor C complex, couples DNA replication and mitosis in budding yeast. *PNAS* Jul 9;93(14):7048-52.

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8 Tong et al., 2004

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