

Table 5 : Yeast genes identified under copper overload conditions, ranked by fitness score and showing the homologous genes in humans, if any, obtained by SGD Best Hits BLASTP.

Systematic Name	Standard Gene Name	Alias	Fitness Score ^a	Human Best Hit ^b Ensembl Peptide ID	Ln (E-value) ^c	Ensembl Gene ID	HGNC Gene Name ^d
YDR395W	<i>SXM1</i>	<i>KAP108</i>	-4.98	ENSP00000369042	6.00E-45	ENSG00000205339	IPO7
YMR105C	<i>PGM2</i>	<i>GAL5</i>	-4.68	ENSP00000360125	1.00E-146	ENSG00000079739	PGM1
YDR414C	<i>ERD1</i>	<i>LDB2</i>	-4.62				
YGL166W	<i>CUP2</i>	<i>ACE1</i>	-4.60				
YKL206C			-4.58				
YGL165C	antisense of <i>CUP2</i>		-4.58				
YDR455C	antisense of <i>NHX1</i>		-4.58				
YLR057W			-4.51	ENSP00000360645	2.00E-07	ENSG00000177239	MAN1B1
YPL057C	<i>SUR1</i>	<i>LPE15 CSG1 BCL21</i>	-4.43				
YOR068C	<i>VAM10</i>	<i>YOR29-19</i>	-4.30				
YDR372C	<i>VPS74</i>	<i>API1</i>	-4.20	ENSP00000265070 ENSP00000371591	9.00E-44	ENSG00000113384 ENSG00000113384	GOLPH3
YMR315W			-4.10	ENSP00000221403	1.00E-04	ENSG00000104808	DHDH
YBR164C	<i>ARL1</i>	<i>DLP2</i>	-4.03	ENSP00000261636	8.00E-49	ENSG00000120805	ARL1
YKR042W	<i>UTH1</i>		-3.83				
YJR116W			-3.80	ENSP00000359222	4.00E-05	ENSG00000152078	TMEM56
YPL226W	<i>NEW1</i>		-3.71	ENSP00000292808	1.00E-44	ENSG00000161204	ABCF3
YOR069W	<i>VPS5</i>	<i>YOR29-20 VPT5 PEP10 GRD2</i>	-3.66	ENSP00000369638	4.00E-27	ENSG00000028528	SNX1
YOR216C	<i>RUD3</i>	<i>GRP1</i>	-3.62				
YJL154C	<i>VPS35</i>	<i>VPT7 GRD9</i>	-3.60	ENSP00000299138	1.00E-99	ENSG00000069329	VPS35
YIL154C	<i>IMP2'</i>	<i>IMP2</i>	-3.58				
YJR139C	<i>HOM6</i>		-3.57				
YGR058W			-3.55	ENSP00000264933 ENSP00000372257	2.00E-11 2.00E-11	ENSG00000063438 ENSG00000063438	AHRR PDCD6 AHRR PDCD6
YLR025W	<i>SNF7</i>	<i>VPS32 DID1</i>	-3.50	ENSP00000216822	2.00E-13	ENSG00000100931	CHMP4A
YKL041W	<i>VPS24</i>	<i>DID3</i>	-3.50	ENSP00000263856	1.00E-11	ENSG00000115561	VPS24

YPR032W	SRO7	SOP1 SNI1	-3.44	ENSP00000273666	2.00E-10	ENSG00000145087	STXBP5L
YIL005W	EPS1		-3.41	ENSP00000369081	3.00E-06	ENSG00000188428	MUTED
							TXNDC5
YML071C	COG8	DOR1	-3.39	ENSP00000305459	2.00E-04	ENSG00000157312	COG8
							PDF
YJL053W	PEP8	VPT4 VPS26 GRD6	-3.39	ENSP00000263559	9.00E-51	ENSG00000122958	VPS26A
				ENSP00000362480	9.00E-51	ENSG00000122958	VPS26A
YMR291W			-3.34	ENSP00000295943	7.00E-26	ENSG00000163673	DCAMKL3
YJL082W	IML2		-3.33	ENSP00000306598	1.00E-07	ENSG00000168234	C18orf17
YOL001W	PHO80	VAC5 TUP7 AGS3	-3.27				
YJR137C	ECM17	MET5	-3.22	ENSP00000343344	3.00E-09	ENSG00000188566	NDOR1
				ENSP00000360576	3.00E-09	ENSG00000188566	NDOR1
YJL004C	SYS1		-3.21				
YBR151W	APD1		-3.14				
YIR039C	YPS6		-3.14	ENSP00000362116	8.00E-06	ENSG00000096088	PGC
YOL008W			-3.12	ENSP00000257927	2.00E-06	ENSG00000135469	COQ10A
YOR070C	GYP1	YOR29-21	-3.10	ENSP00000362590	3.00E-74	ENSG00000065491	TBC1D22B
YMR139W	RIM11	MDS1 GSK3	-3.07	ENSP00000264235	4.00E-99	ENSG00000082701	GSK3B
YLL046C	RNP1		-3.06				
YOL075C			-2.99	ENSP00000237612	7.00E-58	ENSG00000118777	ABCG2
YNL291C	MID1		-2.96				
YPR051W	MAK3		-2.95	ENSP00000298406	7.00E-35	ENSG00000139977	NAT12
YHR012W	VPS29	PEP11	-2.89	ENSP00000353786	1.00E-25	ENSG00000111237	VPS29
YJL123C			-2.85				
YGR170W	PSD2		-2.85	ENSP00000266095	4.00E-07	ENSG00000100141	PISD
YER090W	TRP2		-2.85				
YOR089C	VPS21	YPT51 YPT21 VPT12 VPS12	-2.81	ENSP00000273047	2.00E-44	ENSG00000144566	RAB5A
YDR456W	NHX1	NHA2 VPS44	-2.81	ENSP00000359732	1.00E-55	ENSG00000198689	SLC9A6
YKR019C	IRS4		-2.76				
YNL072W	RNH201	Rnh2A RNH35	-2.75	ENSP00000221486	8.00E-43	ENSG00000104889	RNASEH2A
YIL006W			-2.75	ENSP00000297578	2.00E-39	ENSG00000164933	SLC25A32
YPL200W	CSM4		-2.71				
YOR136W	IDH2		-2.68	ENSP00000299518	3.00E-86	ENSG00000166411	IDH3A
YNR006W	VPS27	DID7 VPT27 VPL27 VPL23 SSV17 GRD11	-2.67	ENSP00000331201	1.00E-16	ENSG00000185359	HGS
YNL084C	END3		-2.67	ENSP00000360798	1.00E-09	ENSG00000085832	EPS15
YJR117W	STE24	PIO2 AFC1	-2.66	ENSP00000361845	4.00E-56	ENSG00000084073	ZMPSTE24

YOR132W	VPS17	PEP21	-2.63				
YLL053C			-2.63	ENSP00000265298	1.00E-12	ENSG00000106125	AQP1
YHR087W			-2.60				
YER019W	ISC1		-2.60	ENSP00000258052	2.00E-26	ENSG00000135587	SMPD2
YBR036C	CSG2	CLS2	-2.59				
YDL117W	CYK3		-2.58				
YLR374C			-2.58				
YPL051W	ARL3		-2.55	ENSP00000326884	4.00E-45	ENSG00000101246	ARFRP1
				ENSP00000352746		ENSG00000101246	
YKL048C	ELM1	LDB9	-2.51	ENSP00000321230	4.00E-24	ENSG00000110931	CAMKK2
YER087C-A			-2.51				
YOL048C			-2.49				
YPL227C	ALG5		-2.49	ENSP00000239891	2.00E-53	ENSG00000120697	ALG5
YBL051C	PIN4	MDT1	-2.47				
YMR183C	SSO2		-2.46	ENSP00000222812	3.00E-15	ENSG00000106089	STX1A
YIL065C	FIS1	MDV2	-2.45	ENSP00000223136	1.00E-06	ENSG00000106404	CLDN15
				ENSP00000223136	1.00E-06	ENSG00000106404	FIS1
YGR237C			-2.45				
YEL031W	SPF1	PER9 PIO1 COD1	-2.45	ENSP00000349877	1.00E-261	ENSG00000105726	ATP13A1
YNR064C			-2.45	ENSP00000359410	2.00E-07	ENSG00000172031	ABHD7
YLR027C	AAT2	ASP5	-2.45	ENSP00000359539	6.00E-99	ENSG00000120053	GOT1
YNL041C	COG6	SEC37 COD2	-2.42	ENSP00000255468	2.00E-07	ENSG00000133103	COG6
YML047C	PRM6		-2.40				
YLR422W			-2.39	ENSP00000266037	7.00E-29	ENSG00000088538	DOCK3
YNL099C	OCA1		-2.38				
YLL020C			-2.38				
YDR354W	TRP4		-2.36				
YKL090W	CUE2		-2.33				
YHR151C			-2.28				
YDR008C			-2.28				
YDL048C	STP4		-2.22				
YEL053C	MAK10		-2.19	ENSP00000354972	5.00E-08	ENSG00000135040	MAK10
YLR450W	HMG2		-2.19	ENSP00000287936	1.00E-261	ENSG00000113161	HMGCR
				ENSP00000369876	1.00E-125	ENSG00000113161	HMGCR
YDR486C	VPS60	CHM5 MOS10	-2.19	ENSP00000223500	1.00E-12	ENSG00000086065	CHMP5
				ENSP00000368916	1.00E-12	ENSG00000086065	CHMP5
YMR214W	SCJ1		-2.17	ENSP00000314030	2.00E-37	ENSG00000069345	DNAJA2
YJR075W	HOC1		-2.16				

YJR102C	VPS25	VPT25	-2.14	ENSP00000253794	5.00E-15	ENSG00000131475	VPS25
YMR202W	ERG2	END11	-2.14	ENSP00000353935	1.00E-17	ENSG00000147955	OPRS1
YIL041W			-2.13				
YDR007W	TRP1		-2.13				
YEL042W	GDA1	GDPase	-2.10	ENSP00000365840	2.00E-43	ENSG00000197586	ENTPD6
YOR085W	OST3		-2.07	ENSP00000354649	1.00E-09	ENSG00000102158	
YOL064C	MET22	HAL2	-2.05				
YHL040C	ARN1		-2.01				
YMR313C	TGL3		-1.99				
YJR088C			-1.96				
YOL006C	TOP1	MAK17 MAK1	-1.95	ENSP00000328835	1.00E-261	ENSG00000184428	TOP1MT
YML097C	VPS9	VPT9 VPL31	-1.94	ENSP00000370208	3.00E-19	ENSG00000154710	KCTD7
				ENSP00000370208	3.00E-19	ENSG00000154710	RABGEF1
YGL148W	ARO2		-1.93				
YGR229C	SMI1	KNR4	-1.93				
YDR072C	IPT1	KTI6 SYR4	-1.93				
YDL118W			-1.91				
YMR300C	ADE4		-1.89	ENSP00000264220	7.00E-59	ENSG00000128059	PPAT
YHL034C	SBP1	SSB1 SSBR1	-1.88				
YER161C	SPT2	EXA1 SIN1	-1.86				
YPR065W	ROX1	REO1	-1.86	ENSP00000223096	2.00E-05	ENSG00000177732	SOX12
				ENSP00000347646	2.00E-05	ENSG00000177732	SOX12
YBL017C	PEP1	VPT1 VPS10	-1.83	ENSP00000329124	3.00E-38	ENSG00000184985	SORCS2
YGL012W	ERG4		-1.83	ENSP00000272163	3.00E-37	ENSG00000143815	LBR
				ENSP00000339883	3.00E-37	ENSG00000143815	LBR
YOL043C	NTG2	SCR2	-1.81	ENSP00000219066	3.00E-37	ENSG00000065057	NTHL1
YFR039C			-1.81				
YLR131C	ACE2		-1.78				
YDR484W	VPS52	SAC2	-1.76	ENSP00000363769	8.00E-16	ENSG00000112478	VPS52
YDR108W	GSG1	MUM1 TRS85	-1.76				
YLR309C	IMH1	SYS3	-1.75	ENSP00000350717	7.00E-06	ENSG00000196569	LAMA2
YML072C	TCB3		-1.74	ENSP00000308957	5.00E-08	ENSG00000175471	MCTP1
YKR035C			-1.68				
YOL011W	PLB3		-1.66	ENSP00000371833	3.00E-07	ENSG00000168907	PLA2G4F
YHR210C			-1.61	ENSP00000272252	7.00E-28	ENSG00000143891	GALM
				ENSP00000368183	7.00E-28	ENSG00000143891	GALM
YOL028C	YAP7		-1.60				

YPL261C			-1.59				
YOR061W	CKA2	YOR29-12	-1.59	ENSP00000217244	2.00E-93	ENSG00000101266	CSNK2A1
				ENSP00000339247	2.00E-93	ENSG00000101266	CSNK2A1
				ENSP00000371400	2.00E-93	ENSG00000101266	CSNK2A1
YLR286C	CTS1		-1.59				
YGL005C	COG7	COD5	-1.57				
YOL018C	TLG2		-1.56	ENSP00000350723	7.00E-13	ENSG00000124222	NPEPL1
				ENSP00000350723		ENSG00000124222	STX16
YPL205C			-1.55				
YNL123W			-1.53	ENSP00000357980	6.00E-08	ENSG00000166033	HTRA1
YJL105W	SET4		-1.53	ENSP00000327505	1.00E-03	ENSG00000005483	MLL5
YDR443C	SSN2	MED13 RYE3 UME2 SRB9 S	-1.52				
YNL197C	WHI3		-1.51				
YCR024C-A	PMP1		-1.50				
YPR064W			-1.49				
YKL037W			-1.48				
YPL102C			-1.48				
YNR029C			-1.47	ENSP00000371867	8.00E-55	ENSG00000147996	CBWD1
YOL041C	NOP12		-1.46	ENSP00000354765	1.00E-20	ENSG00000188739	RBM34
				ENSP00000355565	1.00E-20	ENSG00000188739	RBM34
YKL126W	YPK1	SLI2	-1.45	ENSP00000340608	2.00E-90	ENSG00000101049	SGK2
YER145C	FTR1		-1.44				
YMR310C			-1.44	ENSP00000354812	3.00E-06	ENSG00000198917	C9orf114
YMR316W	DIA1		-1.40				
YNL212W	VID27		-1.38				
YJR105W	ADO1		-1.36	ENSP00000361819	3.00E-53	ENSG00000156110	ADK
YNL300W		TOS6	-1.36				
YMR077C	VPS20	CHM6	-1.36	ENSP00000317468	6.00E-10	ENSG00000176108	CHMP6
YOL071W	EMI5		-1.35	ENSP00000301761	4.00E-16	ENSG00000167985	
YPR087W	VPS69		-1.31				
YDR076W	RAD55		-1.26				
YLR130C	ZRT2		-1.24				
YPR038W			-1.23				
YOL085C			-1.21				
YPR050C			-1.18				
YJL120W			-1.18				
YGR012W			-1.17	ENSP00000352643	9.00E-34	ENSG00000160200	CBS

YPL259C	APM1	YAP54	-1.16	ENSP00000291439	1.00E-261	ENSG00000072958	AP1M1
YOL030W	GAS5		-1.15				
YPL162C			-1.12	ENSP00000310180	1.00E-13	ENSG00000055955	ITIH4
				ENSP00000310180	1.00E-13	ENSG00000055955	MUSTN1
				ENSP00000310180	1.00E-13	ENSG00000055955	TMEM110
YDR495C	VPS3	VPT17 VPL3 PEP6	-1.11				
YOR322C			-1.07				
YDR146C	SWI5		-1.03	ENSP00000250916	2.00E-14	ENSG00000129911	KLF16
YJL119C			-1.02				
YDL041W			-1.01				
YLR455W			-0.98				
YMR054W	STV1		-0.94	ENSP00000342951	1.00E-125	ENSG00000033627	ATP6V0A1
YOL070C			-0.91				
YMR152W	YIM1		-0.89	ENSP00000358059	2.00E-14	ENSG00000130347	RTN4IP1
YGR217W	CCH1		-0.81	ENSP00000251127	2.00E-52	ENSG00000102452	VGCNL1
YOR015W			-0.76				
YNL025C	SSN8	CycC RYE2 UME3 SRB11 N	-0.76	ENSP00000319027	3.00E-19	ENSG00000112237	CCNC
YPL150W			-0.75	ENSP00000262891	8.00E-46	ENSG00000007047	MARK4
YMR251W-A	HOR7		-0.73				
YML128C	MSC1		-0.63				
YJL108C	PRM10		-0.59				
YGL064C	MRH4		0.41	ENSP00000362687	4.00E-18	ENSG00000107625	DDX50
YMR074C			0.80				
YNR031C	SSK2		0.86	ENSP00000265125	2.00E-51	ENSG00000085511	MAP3K4
				ENSP00000297332	2.00E-51	ENSG00000085511	MAP3K4
YGR178C	PBP1	MRS16	0.88	ENSP00000366843	1.00E-03	ENSG00000204842	ATXN2
YGR072W	UPF3	SUA6	0.98				
YFR012W			1.10				
YKR010C	TOF2		1.23				
YGR289C	MAL11	AGT1	1.25	ENSP00000361579	3.00E-08	ENSG00000117394	SLC2A1
YNR051C	BRE5		1.36				
YMR073C			1.37	ENSP00000358693	1.00E-09	ENSG00000065615	CYB5R4
YHL027W	RIM101	RIM1	1.37	ENSP00000261438	1.00E-04	ENSG00000109787	KLF3
				ENSP00000262366	1.00E-04	ENSG00000126603	GLIS2
				ENSP00000318057	1.00E-04	ENSG00000179388	EGR3
				ENSP00000361373	1.00E-04	ENSG00000171872	KLF17
				ENSP00000370556	1.00E-04	ENSG00000179388	EGR3
				ENSP00000371382	1.00E-04	ENSG00000109787	KLF3

YBR250W			1.39				
YGR192C	<i>TDH3</i>	<i>SSS2 HSP36 HSP35 GLD1</i>	1.44	ENSP00000229239	1.00E-261	ENSG00000111640	GAPDH
YDR451C	<i>YHP1</i>		1.46				
YMR080C	<i>NAM7</i>	<i>UPF1 MOF4 IFS2</i>	1.56	ENSP00000262803	1.00E-261	ENSG00000005007	UPF1
YPR066W	<i>UBA3</i>		1.56	ENSP00000354340	3.00E-66	ENSG00000144744	UBE1C
YDR244W	<i>PEX5</i>	<i>PAS10</i>	1.59	ENSP00000266563	6.00E-44	ENSG00000139197	PEX5
				ENSP00000266564	6.00E-44	ENSG00000139197	PEX5
YOL095C	<i>HMI1</i>		1.61				
YJR059W	<i>PTK2</i>	<i>STK2</i>	1.73	ENSP00000354168	1.00E-16	ENSG00000178093	TSSK6
YJL056C	<i>ZAP1</i>	<i>ZRG10</i>	1.82	ENSP00000295208	7.00E-29	ENSG00000144026	ZNF514
YDR337W	<i>MRPS28</i>		1.97	ENSP00000362208	4.00E-04	ENSG00000116898	MRPS15
YMR275C	<i>BUL1</i>	<i>SMM2 RDS1 DAG1</i>	2.29				
YDR363W-A	<i>SEM1</i>	<i>HOD1 DSS1</i>	2.65				
YHR167W	<i>THP2</i>		2.77				
YHR073W	<i>OSH3</i>		3.55	ENSP00000315331	2.00E-57	ENSG00000070882	OSBPL3

^a The fitness score is a measure of the relative growth of a particular deletion mutant in the treatment and control media.

^b Information for homologous genes in humans was obtained from SGD's model organism BLASTP best hits, which contains the results of NCBI BLASTP analysis using the protein sequence of each *S. cerevisiae* ORF as the query sequence against the predicted protein sequences in humans. Blank fields indicate absence of a significant hit in the human database.

^c The expect threshold (E-value) represents the number of hits expected to be found by chance.

^d Gene name as indicated by the HUGO Gene Nomenclature Committee (HGNC).