

Supplementary Table S1. PCR primers used in this study.	
PCBD1 Mutagenic Primers Sequence (5'-->3')	
Forward (S208L); NTP9-1st Mut-F	CAAATGGCGTATGCAGTATTAAAGAAAAGTGC
Reverse (S208L); NTP9-1st Mut-R	CATTTTTCAGCAGTTTCTTTAATACTGCATACGC
Forward (P216R); NTP9-2nd Mut-F	GAAAACTGCTAAAAATGCTCGAAAAGTTGCAG
Reverse (P216R); NTP9-2nd Mut-R	CTCCATCTGCAACTTTTCGAGCATTTTTCAGC
psNTP9 N-Terminal Deletion Primers	
NTP9-F-N	GAAATTTCTCTTACGCTGTAGTATTC
NTP9-R	TTAAACAAAATACATCAATC
psNTP9 NLS Deletion Primers	
NTP9-F	ATGGAGCTCCTTATTAAACTTATCAC
NTP9-R	TTAAACAAAATACATCAATC
NTP9-NLS-NR	GATCATATGGTATTCCTGATACTGCATACGCC
NTP9-NLS-CF	GGCGTATGCAGTATCAGGAATACCATATGATC
13Myc-tagged PS and DM Expression Constructs	
HW1	ATCGATCGACCGCGGGGAGGTGGAGGTTACCCGGGTATAAACGGT
HW2	AATCACTAGTGAATTCGCGCGTCGACTCGATCGAT
HW3	ATCGATCGAGTCGACTCATGTAATTAGTTATGTCACGCT
HW4	ATTGAGCGATTGATGTATTTTGTTCGCGGTCGATCGAT
psNTP9/spNTP9-DM Specific Primers	
PS, DM-F	GCTCCAAAAGTTGCAGATGG
PS, DM-R	CCGAAGTGTAAGTA ACTGTGA
npt/1 Specific Primers	
nptll-F	ATGATTGAACAAGATGGATTGC
nptll-R	TCAGAAGAACTCGTCAAGAAG
psNTP9/psNTP9-DM Specific qRT-PCR Primers	
NTP9/DM-F	ATGGAGCTCCTTATTAAACTTATCAC
NTP9/DM-R	TTAAACAAAATACATCAATCGCTCAA
Actin-F	CCCGCTATGTATGTTCG
Actin-R	AAGGTCAAGACGGAGGAT
PP2A-F	GTTGTGTGAGCACGCAAAGA
PP2A-R	GTTGTGTGAGCACGCAAAGA
DTX3 V2-F	CCCATTCAGAACTGCTGTGAAAC
DTX3 V2-R	CACTTCTCTTCACATGCCGA
UPB1-F	AAGACAAAGGGCTCGAAGGG
UPB1-R	TGTATTGCGCGACAAGGTCT
UGT74E2-F	GTGGAAGGTTGGGGTAAGGG
UGT74E2-R	TGGACTTGCAAAAGACGATGT
PHO2-F	GCTCAGTCCCAGGTCACAAA
PHO2-R	TCGTGATATGGCGTTCCAGG

AT1G75945-F	TCGTTTTTTGGCTCTCTGCCT
AT1G75945-R	TGCCCTACGAGACCCTAAGA
DAL5-F	AAGACTGGCTGGTGCTTACC
DAL5-R	AAGGTTTGTGGTCCTGCCAA
ALG9-F	CACGGATAGTGGCTTTGGTGAACAATTAC
ALG9-R	TATGATTATCTGGCAGCAGGAAAGAACTTGGG
FIT2-F	TGGTCACGGACTTGACGAAG
FIT2-R	ACGGTCATTTCGTGGTCCTC
AGP1-F	TGGCGCTGGTAATGATGGTT
AGP1-R	ATCATTGTTTGGCCGCACC
ASP3-1-F	GTTCCCTCCAGATGATGCCCC
ASP3-1-R	CCGTAGCCGGAGTACAAACA
VTC3-F	TGTTTTGCGGAGTATGGGCT
VTC3-R	AACGAAGGCTGGGAGGAAAC
GIT1-F	GCGTCGAATGTTTCCAACCC
GIT1-R	CCCATCTTACCAGTCCAGCC
GDE1-F	ACGGTTGGTGCAAGTGGTTA
GDE1-R	CACTATCGACGATCACGGCA

Supplementary Table S2. Enzymatic characterization of partially-purified PS and DM proteins extracted from yeast. A) Specific activities with different adenylate substrates. B) Effects of Ca^{2+} and calmodulin (CaM) on activities. Activities were assayed in 60 mM Hepes buffer, pH 7.5, 3 mM MgCl_2 , 3 mM substrate, incubated at 28°C for 16 min. Total protein: PS sample, 3.2 μg ; DM sample 3.0. Data are means of two replicate assays in which the purities of PS and DM were >23%<29%, as estimated by specific activities, assuming >95% pure PS has a specific activity of 138 $\mu\text{mol Pi mg protein}^{-1} \text{ min}^{-1}$ (Chen et al., 1987).

A

APY Assayed	Substrate	Specific Activity ($\mu\text{mole Pi/mg protein/min}$)
PS	ATP	75
	ADP	58
	AMP	<2.0
DM	ATP	47
	ADP	25.3
	AMP	<2.0

B

Treatment	Specific Activity ($\mu\text{mole Pi/mg protein/min}$)
-CaM	37.6
+CaM	41.2
+CaM+EGTA	36.5
-CaM	30.1
+CaM	32.4
+CaM+EGTA	29.3

Supplementary Table S3. Summary of PS peptides identified by MS in the chromatin-enriched samples of EV-, PS-, and DM-expressing NS219 yeast. **(A)** Peptides of known chromatin-associated proteins identified in chromatin-enriched fractions isolated from yeast expressing either EV, PS, or DM. **(B)** Identification of PS peptides in the chromatin fractions of PS- and DM-expressing yeast, but not in the chromatin-enriched fraction of EV-expressing yeast. Each of the peptides in the chromatin-enriched fractions isolated from PS- and DM-expressing yeast were identified multiple times by MS.

A

Complex	Proteins whose peptides were detected by MS
Histones	Histone H1, Histone H2AZ, HistoneH3, Histone H4
RNA polymerases	Rpa190, Rpa135, Rpa49, Rpa43, Rpa34, Rpb1, Rpb2, Rpc40, Rpc34, Rpc31, Rpc25, Rpc19, Rpc17
Replication factors	Rfa1, Rfc1, Rfc2, Rfc3, Clf4
Chromatin remodelers (RSC, SWI/SNF, SWR1, INO80)	Sth1, Rsc3, Rsc4, Rsc6, Rsc7, Rsc8, Rsc9, Rsc14, Rsc30, Sfh1, Npl6, Arp7, Isw1, Isw2, Ioc2, Ioc3, Swr1, Rvb1, Rvb2, Nhp10, Ies1, Ies3
Transcription Factors	TFB1, TAF4, TAF5, TAF8, TAF12, TAF14, TFC4, TFC6, TFC7, Spt6, Spn1

B

Identified PS peptides in EV sample	none
Identified PS peptides found in PS sample	QEEIS\$YAVVFDAGSTGSRIHVYHFNQNLDLLHIGK; ITPGLSSYANNPEQAAKSLIPLLEQAEDVVPDDLQPK; TVGVIDLGGGSVQMAYAVSK; GIPYDLYVHSYLHFGR; SPNPCLLAGFNGIYTYSGEEFKATAYTSGANFNK; NLFASS\$FFYLPEDTGMVDASTPNFILRPVDIETKAKEACALNFEDAK; EIEYQDAIVEAAWPLGNAVEAISALPK
Identified PS peptides found in DM sample	ITPGLSSYANNPEQAAK; SPNPCLLAGFNGIYTYSGEEFKATAYTSGANFNK
Identified PS peptides in EV sample	None

Supplemental Table S3C. Mass-spectrometry identification of yeast chromatin proteins. Mitochondrial and "other" proteins are also listed.

COLOR CODE: Yellow, chromatin-associated proteins (1,291); orange, mitochondrial proteins (399); non-colored, other protein (689)

PROTEIN NAMES
ADP,ATP carrier protein 1
ARS-binding factor 1
Actin-binding protein
Acetyl-CoA carboxylase;Biotin carboxylase
Metallothionein expression activator
Acetyl-coenzyme A synthetase 2
Transcriptional adapter 2
Bifunctional purine biosynthesis protein ADE16;Phosphoribosylaminoimidazolecarboxamide formyltransferase;IMP cyclohydrolase
Bifunctional purine biosynthesis protein ADE17;Phosphoribosylaminoimidazolecarboxamide formyltransferase;IMP cyclohydrolase
Amidophosphoribosyltransferase
Phosphoribosylformylglycinamide synthase
Adenylate kinase
Probable ATP-dependent permease
Regulatory protein ADR1
Accumulation of dyads protein 2
Iron-regulated transcriptional activator AFT1
ADP-ribosylation factor GTPase-activating protein effector protein 1
Hsp90 co-chaperone AHA1
Intron-encoded DNA endonuclease al4;Truncated non-functional cytochrome oxidase 1;DNA endonuclease al4
Probable oxidoreductase AIM17
Serine/threonine-protein kinase AKL1
Lysophospholipid acyltransferase
Dol-P-Man:Man(7)GlcNAc(2)-PP-Dol alpha-1,6-mannosyltransferase
UDP-N-acetylglucosamine transferase subunit ALG13
Dolichyl-phosphate beta-glucosyltransferase
Alpha-1,2-mannosyltransferase ALG9
Serine/threonine-protein kinase Haspin homolog ALK1
Serine/threonine-protein kinase Haspin homolog ALK2
Alpha-mannosidase
Protein APA1;5,5-P-1,P-4-tetraphosphate phosphorylase;ADP-sulfurylase
Vacuolar aminopeptidase 1
Aspartyl aminopeptidase 4
AP-1 complex subunit beta-1
AP-2 complex subunit alpha
AP-1 complex subunit gamma-1
AP-1 complex subunit mu-1-l
Adenine phosphoribosyltransferase 1
tRNA-aminoacylation cofactor ARC1
Actin-related protein 2/3 complex subunit 5
Actin-related protein 2/3 complex subunit 1
N-terminal acetyltransferase A complex catalytic subunit ARD1
Sterol O-acyltransferase 2
Pentafunctional AROM polypeptide;3-dehydroquinate synthase;3-phosphoshikimate 1-carboxyvinyltransferase;Shikimate kinase;3-d
Aromatic amino acid aminotransferase 2
Actin-like protein ARP6
Actin-related protein 7
Actin-like protein ARP9
Probable metalloprotease ARX1
Guanine nucleotide-binding protein subunit beta-like protein

Activator of stress genes 1
Activator of SKN7 protein 10
Serine/threonine-protein kinase ATG1
Autophagy-related protein 19
Ammonia transport outward protein 3
NADPH-dependent 1-acyldihydroxyacetone phosphate reductase
Asparagine-rich zinc finger protein AZF1
Leu/Val/Ile amino-acid permease
Branched-chain-amino-acid aminotransferase, cytosolic
Myosin tail region-interacting protein MTI1
Spindle pole component BBP1
Serine/threonine-protein kinase BCK1/SLK1/SSP31
cAMP-dependent protein kinase regulatory subunit
Bromodomain-containing factor 1
Bromodomain-containing factor 2
Transcription factor TFIIIB component B
GTPase-activating protein BEM2/IPL2
Nuclear segregation protein BFR1
Protein BFR2
Nuclear fusion protein BIK1
Adenosylmethionine-8-amino-7-oxononanoate aminotransferase
Protein BMH1
Ribosome biogenesis protein BMS1
25S rRNA (uridine(2634)-N(3))-methyltransferase
Protein BOB1
Protein BOI2
UBP3-associated protein BRE5
Transcription factor IIIB 70 kDa subunit
Condensin complex subunit 2
Vacuolar-sorting protein BRO1
Pre-mRNA-splicing factor BRR1
Pre-mRNA-splicing helicase BRR2
Ribosome biogenesis protein BRX1
Protein BSP1
Bud site selection protein 21
Bud site selection protein 22
18S rRNA (guanine(1575)-N(7))-methyltransferase
Pre-mRNA-splicing factor BUD31
Ubiquitin ligase-binding protein BUL1
Negative cofactor 2 complex subunit alpha
Chromatin assembly factor 1 subunit p60
CCR4-NOT transcriptional complex subunit CAF120
Elongation factor 1-gamma 1
Centromere DNA-binding protein complex CBF3 subunit A
H/ACA ribonucleoprotein complex subunit 4
Serine/threonine-protein kinase CBK1
NADH-cytochrome b5 reductase 1
Cytochrome B translational activator protein CBS2
Glucose-repressible alcohol dehydrogenase transcriptional effector
T-complex protein 1 subunit beta
T-complex protein 1 subunit gamma
T-complex protein 1 subunit delta
T-complex protein 1 subunit zeta
Cell division control protein 1
Cell division control protein 12
Tyrosine-protein phosphatase CDC14

Cell division control protein 24
Cell division control protein 3
Eukaryotic translation initiation factor 4E
Hsp90 co-chaperone Cdc37
General negative regulator of transcription subunit 1
Cell division control protein 48
Cell cycle serine/threonine-protein kinase CDC5/MSD2
Leucine--tRNA ligase, cytoplasmic
Cell division control protein 73
DNA ligase 1
Phosphatidate cytidyltransferase
Protein CFT1
Activatory protein CHA4
Clathrin heavy chain
Chromo domain-containing protein 1
ATP-dependent RNA helicase CHL1
CDP-diacylglycerol--serine O-phosphatidyltransferase
Phosphatidylethanolamine N-methyltransferase
Chitin biosynthesis protein CHS5
Proteasome-interacting protein CIC1
Casein kinase II subunit alpha
Casein kinase II subunit alpha
Casein kinase II subunit beta
Casein kinase II subunit beta
Serine/threonine-protein kinase CLA4
Serine/threonine-protein phosphatase 2B catalytic subunit A2
DNA damage-binding protein CMR1
Protein CMS1
Chaotic nuclear migration protein 67
Coatomer subunit alpha
Cobalt uptake protein COT1
Cytochrome c oxidase subunit 7A
Peptidyl-prolyl cis-trans isomerase
Peptidyl-prolyl cis-trans isomerase D
Peptidyl-prolyl cis-trans isomerase CPR6
Carboxypeptidase S
Probable S-adenosylmethionine-dependent methyltransferase CRG1
Cruciform DNA-recognizing protein 1;CRP1 short N-terminal subpeptide;CRP1 short C-terminal subpeptide
Transcriptional regulator CRZ1
Histone H3-like centromeric protein CSE4
Monopolin complex subunit CSM1
Cop9 signalosome complex subunit 12
Transcription factor CSR2
ATF/CREB activator 2
Chromosome stability protein 9
Chromosome transmission fidelity protein 18
DNA polymerase alpha-binding protein
RNA polymerase-associated protein CTR9
Pre-mRNA-splicing factor CWC22
Cystathionine beta-synthase
Serine/threonine-protein kinase DBF20
ATP-dependent RNA helicase DBP1
ATP-dependent RNA helicase DBP10
ATP-dependent RNA helicase DBP2
ATP-dependent RNA helicase DBP3
ATP-dependent RNA helicase DBP5

ATP-dependent RNA helicase DBP6
ATP-dependent RNA helicase DBP7
ATP-dependent RNA helicase DBP8
ATP-dependent RNA helicase DBP9
mRNA-decapping enzyme subunit 1
mRNA-decapping enzyme subunit 2
ATP-dependent RNA helicase DED1
Asparagine-tRNA ligase, cytoplasmic
Transcriptional regulatory protein DEP1
Broad-range acid phosphatase DET1
ATP-dependent RNA helicase DHH1
Probable ATP-dependent RNA helicase DHR2
Down-regulator of invasive growth 1
Dimethyladenosine transferase
U3 small nucleolar RNA-associated protein 12
Histone-lysine N-methyltransferase, H3 lysine-79 specific
Y element ATP-dependent helicase protein 1 copy 6;Y element ATP-dependent helicase
DNA polymerase epsilon subunit B
DNA polymerase epsilon subunit D
Dolichol-phosphate mannosyltransferase
ATP-dependent RNA helicase DRS1
Chromatin modification-related protein EAF1
Chromatin modification-related protein EAF3
Chromatin modification-related protein EAF5
rRNA-processing protein EBP2
Probable ATP-dependent RNA helicase DHR1
Proteasome component ECM29
3-methyl-2-oxobutanoate hydroxymethyltransferase
Putative ATP-dependent RNA helicase ECM32
Cell wall protein ECM33
Glutathione S-transferase omega-like 2
EH domain-containing and endocytosis protein 1
Elongation factor 1-beta
rRNA-processing protein EFG1
Protein-lysine N-methyltransferase EFM1
Elongation factor 2
Eisosome protein 1
Serine/threonine-protein kinase ELM1
Elongator complex protein 2
ER membrane protein complex subunit 1
ER membrane protein complex subunit 2
Ribosomal RNA small subunit methyltransferase NEP1
Enolase 2
Essential nuclear protein 1
Ribosome biogenesis protein ENP2
Late endosome and vacuole interface protein 11
Probable oxidoreductase ENV9
Enhancer of polycomb-like protein 1
Ribosome biogenesis protein ERB1
Acetyl-CoA acetyltransferase
Lanosterol 14-alpha demethylase
Delta(14)-sterol reductase
3-keto-steroid reductase
Delta(24(24(1)))-sterol reductase
Sterol 24-C-methyltransferase
ER-localized J domain-containing protein 5

Endoplasmic reticulum vesicle protein 25
ER-derived vesicles protein ERV29
ER-derived vesicles protein ERV46
Histone acetyltransferase ESA1
Silent chromatin protein ESC1
Pre-rRNA-processing protein ESF1
Enhancer of translation termination 1
Long-chain-fatty-acid--CoA ligase 3
Long-chain-fatty-acid--CoA ligase 4
Adenylate kinase isoenzyme 6 homolog FAP7
Fatty acid synthase subunit beta;3-hydroxyacyl-[acyl-carrier-protein] dehydratase;Enoyl-[acyl-carrier-protein] reductase [NADH];[Acyl-
Fatty acid synthase subunit alpha;Acyl carrier;3-oxoacyl-[acyl-carrier-protein] reductase;3-oxoacyl-[acyl-carrier-protein] synthase
Hsp70 nucleotide exchange factor FES1
Pre-rRNA-processing protein FHL1
1,3-beta-glucan synthase component FKS1
SUR7 family protein FMP45
GTP cyclohydrolase 1
FK506-binding nuclear protein
FK506-binding protein 4
Glycerol uptake/efflux facilitator protein
Fumarate reductase 1
Fatty acyl-CoA synthetase and RNA processing-associated kinase 1
Phenylalanine--tRNA ligase beta subunit
Phenylalanine--tRNA ligase alpha subunit
Eukaryotic translation initiation factor 5B
Mitogen-activated protein kinase FUS3
Mediator of RNA polymerase II transcription subunit 15
H/ACA ribonucleoprotein complex subunit 1
1,3-beta-glucanosyltransferase GAS1
1,3-beta-glucanosyltransferase GAS5
Transcriptional regulatory protein GAT1
Single-strand telomeric DNA-binding protein GBP2
Translation initiation factor eIF-2B subunit gamma
Eukaryotic translation initiation factor 2 subunit gamma
Translation initiation factor eIF-2B subunit delta
Translation initiation factor eIF-2B subunit epsilon
Translation initiation factor eIF-2B subunit beta
Translational activator GCN1
Serine/threonine-protein kinase GCN2
Protein GCN20
Translation initiation factor eIF-2B subunit alpha
Histone acetyltransferase GCN5
Glycolytic genes transcriptional activator GCR1
Glycolytic genes transcriptional activator GCR2
ADP-ribosylation factor GTPase-activating protein GCS1
ARF guanine-nucleotide exchange factor 1
ADP-ribosylation factor-binding protein GGA2
GTPase-interacting component 2
Serine/threonine-protein kinase GIN4
Zinc finger protein GIS2
Serine/threonine-protein phosphatase PP1-2
Glutamine synthetase
Nitrogen regulatory protein GLN3
Glutamine--tRNA ligase
ADP-ribosylation factor GTPase-activating protein GLO3
Glutathione reductase

Glyoxylate reductase 1
Guanine nucleotide-binding protein alpha-1 subunit
Guanine nucleotide-binding protein alpha-2 subunit
Guanine nucleotide-binding protein subunit beta 1
Guanine nucleotide-binding protein subunit beta 2
Heterotrimeric G protein gamma subunit GPG1
GPI transamidase component GPI16
Phosphoglycerate mutase 1
GPN-loop GTPase 3
NADPH-dependent methylglyoxal reductase GRE2
NADPH-dependent aldose reductase GRE3
GTP-binding nuclear protein GSP2/CNR2
Glycogen [starch] synthase isoform 2
GTP-binding protein GTR2
Glutathione S-transferase 1
GMP synthase [glutamine-hydrolyzing]
Guanylate kinase
Glutamate--tRNA ligase, cytoplasmic
GTPase-activating protein GYP1
GTPase-activating protein GYP5
GTPase-activating protein GYP6
GTPase-activating protein GYP7
GTPase-activating protein GYP8
Transcriptional activator HAA1
Serine/threonine-protein kinase HAL5
Halotolerance protein 9
Heme-responsive zinc finger transcription factor HAP1
Transcriptional activator HAP2
ATP-dependent RNA helicase HAS1
Histone acetyltransferase type B catalytic subunit
Putative nitroreductase HBN1
ATP-dependent RNA helicase HCA4
Hsp90 co-chaperone HCH1
Eukaryotic translation initiation factor 3 subunit J
Inner nuclear membrane protein HEH2
Heterogeneous nuclear rnp K-like protein 2
Transcriptional coactivator HFI1/ADA1
Histone H4
Histone H1
Histone H3
Protein HIR1
Histone transcription regulator 3
Histidinol-phosphate aminotransferase
Imidazole glycerol phosphate synthase hisHF;Glutamine amidotransferase;Cyclase
Protein HLJ1
3-hydroxy-3-methylglutaryl-coenzyme A reductase 1
Putative glycosyltransferase HOC1
Probable histone deacetylase HOS2
Histone deacetylase HOS3
High-osmolarity-induced transcription protein 1
Histone promoter control protein 2
Histidine protein methyltransferase 1
Protein HRB1
Serine/threonine-protein kinase HRK1
Nuclear polyadenylated RNA-binding protein 4
Casein kinase I homolog HRR25

ATP-dependent molecular chaperone HSC82
U2 snRNP component HSH155
Probable serine/threonine-protein kinase HSL1
Protein arginine N-methyltransferase HSL7
Heat shock protein 104
30 kDa heat shock protein
ATP-dependent molecular chaperone HSP82
NAD-dependent protein deacetylase HST1
NAD-dependent protein deacetylase HST2
Histone H2A.2;Histone H2A.1
Histone H2B.2
High temperature lethal protein 1
Histone H2A.Z
Protein HUA2
Eukaryotic translation initiation factor 5A-1
Ino eighty subunit 1
Ino eighty subunit 3
Ino eighty subunit 4
Ino eighty subunit 5
Very-long-chain 3-oxoacyl-CoA reductase
Elongator complex protein 1
Isoleucine--tRNA ligase, cytoplasmic
Vacuolar membrane-associated protein IML1
U3 small nucleolar ribonucleoprotein protein IMP3
U3 small nucleolar ribonucleoprotein protein IMP4
Putative DNA helicase INO80
ISWI one complex protein 2
ISWI one complex protein 3
ISWI one complex protein 4
Pre-rRNA-processing protein IPI3
Uncharacterized ATP-dependent helicase IRC20
Putative ATP-dependent helicase IRC3
Cohesin subunit SCC3
Inositol phosphosphingolipids phospholipase C
Vacuolar protein sorting-associated protein IST1
Increased sodium tolerance protein 2
ISWI chromatin-remodeling complex ATPase ISW1
ISWI chromatin-remodeling complex ATPase ISW2
Imitation switch two complex protein 1
Myo-inositol transporter 1
DnaJ-like chaperone JEM1
WD repeat-containing protein JIP5
Importin subunit beta-4
78 kDa glucose-regulated protein homolog
Kelch repeat-containing protein 1
Kelch repeat-containing protein 3
Serine/threonine protein kinase KIN1
Probable serine/threonine-protein kinase KKQ8
Glycolipid 2-alpha-mannosyltransferase
UPF0202 protein KRE33
Protein KRI1
KRR1 small subunit processome component
Lysine--tRNA ligase, cytoplasmic
Serine/threonine-protein kinase KSP1
Mitogen-activated protein kinase KSS1
Alpha-1,2 mannosyltransferase KTR1

Probable mannosyltransferase KTR3
Sphingosine N-acyltransferase LAC1
Serine palmitoyltransferase 1
Serine palmitoyltransferase 2
U3 small nucleolar ribonucleoprotein protein LCP5
Chromatin structure-remodeling complex protein RSC14
RNA polymerase-associated protein LEO1
3-isopropylmalate dehydratase
Regulatory protein LEU3
La protein homolog
Lysophosphatidic acid:oleoyl-CoA acyltransferase 1
60S ribosomal subunit assembly/export protein LOC1
Peroxisomal membrane protein LPX1
Phospholipid:diacylglycerol acyltransferase
Large subunit GTPase 1
Sm-like protein LSM1
Protein LSM12
U6 snRNA-associated Sm-like protein LSM2
U6 snRNA-associated Sm-like protein LSM4
U6 snRNA-associated Sm-like protein LSM5
U6 snRNA-associated Sm-like protein LSM6
Sphingolipid long chain base-responsive protein LSP1
Target of rapamycin complex subunit LST8
RING-finger protein MAG2
Protein MAK11
Protein MAK16
Ribosome biogenesis protein MAK21
ATP-dependent RNA helicase MAK5
Multiprotein-bridging factor 1
Transcription factor MBP1
Sister chromatid cohesion protein 1
GPI ethanolamine phosphate transferase 1
Pheromone receptor transcription factor
DNA replication licensing factor MCM2
DNA replication licensing factor MCM3
DNA replication licensing factor MCM4
Minichromosome maintenance protein 5
DNA replication licensing factor MCM6
DNA replication licensing factor MCM7
NADH-cytochrome b5 reductase 2;NADH-cytochrome b5 reductase p34 form;NADH-cytochrome b5 reductase p32 form
GTPase-activating protein GYP2
Negative regulator of sporulation MDS3
Serine/threonine-protein kinase MEC1
Mediator of RNA polymerase II transcription subunit 1
Mediator of RNA polymerase II transcription subunit 2
Methionine--tRNA ligase, cytoplasmic
Sulfite reductase [NADPH] flavoprotein component
DNA repair/transcription protein MET18/MMS19
5-methyltetrahydropteroyltriglutamate--homocysteine methyltransferase
mRNA export factor MEX67
Protein MGA2
MICOS complex subunit MIC10
MICOS complex subunit MIC12
MICOS subunit MIC26
MICOS complex subunit MIC27
MICOS complex subunit MIC60

Regulatory protein MIG1
DNA polymerase gamma
Myosin light chain 1
DNA mismatch repair protein MLH1
Probable alpha-1,6-mannosyltransferase MNN10
Probable alpha-1,6-mannosyltransferase MNN11
TATA-binding protein-associated factor MOT1
General negative regulator of transcription subunit 4
Transcriptional activator/repressor MOT3
Protein disulfide isomerase MPD2
ATP-dependent DNA helicase MPH1
U3 small nucleolar RNA-associated protein MPP10
Spindle pole body assembly component MPS3
Multiple RNA-binding domain-containing protein 1
Serine/threonine-protein kinase MRK1
RNA-binding protein MRN1
Ribosome assembly factor MRT4
Morphogenesis-related protein MSB1
Meiotic sister-chromatid recombination protein 3
DNA mismatch repair protein MSH2
Chromatin assembly factor 1 subunit p50
Protein MSN1
Zinc finger protein MSN2
Zinc finger protein MSN4
Maintenance of telomere capping protein 5
U1 small nuclear ribonucleoprotein A
Splicing factor MUD2
Crossover junction endonuclease MUS81
Peptide methionine sulfoxide reductase
Myosin-2
Myosin-3
Myosin-5
Nuclear polyadenylated RNA-binding protein NAB2
Nuclear polyadenylated RNA-binding protein 3
RNA-binding protein NAB6
NET1-associated nuclear protein 1
Nucleosome assembly protein
Probable 26S proteasome regulatory subunit p28
N-terminal acetyltransferase A complex subunit NAT1
N-terminal acetyltransferase A complex subunit NAT5
Nuclear control of ATPase protein 2
Negative cofactor 2 complex subunit beta
Non-classical export protein 2
Multisite-specific tRNA:(cytosine-C(5))-methyltransferase
NADPH--cytochrome P450 reductase
Nucleoporin NDC1
Kinetochore protein NDC80
Nucleolar protein NET1
Chromatin-remodeling complexes subunit NGG1
RNA exonuclease NGL1
Non-histone protein 10
H/ACA ribonucleoprotein complex subunit 2
Non-histone chromosomal protein 6A
Non-histone chromosomal protein 6B
Nucleoporin NIC96
Eukaryotic translation initiation factor 3 subunit C

60S ribosome subunit biogenesis protein NIP7
Nicotinamide/nicotinic acid mononucleotide adenylyltransferase 1
Nicotinamide/nicotinic acid mononucleotide adenylyltransferase 2
60S ribosomal export protein NMD3
20S-pre-rRNA D-site endonuclease NOB1
Nucleolar complex protein 2
Nucleolar complex-associated protein 3
Nucleolar complex protein 4
Nucleolar GTP-binding protein 1
Nucleolar GTP-binding protein 2
rRNA 2-O-methyltransferase fibrillarin
H/ACA ribonucleoprotein complex subunit 3
Nucleolar protein 12
Nucleolar protein 13
Nucleolar complex protein 14
Ribosome biogenesis protein 15
Nucleolar protein 16
25S rRNA (cytosine(2870)-C(5))-methyltransferase
Nucleolar protein 4
Ribosome biogenesis protein NOP53
Nucleolar protein 56
Nucleolar protein 58
Nucleolar protein 6
Pescadillo homolog
60S ribosome subunit biogenesis protein NOP8
Nucleolar protein 9
General negative regulator of transcription subunit 3
General negative regulator of transcription subunit 5
GPN-loop GTPase 1
Nucleolar protein 3
Chromatin structure-remodeling complex subunit RSC7
Nitrogen permease reactivator protein
Nitrogen permease regulator 2
Nitrogen permease regulator 3
Nicotinate phosphoribosyltransferase
Protein NRD1
Ribosome biogenesis protein NSA1
Ribosome biogenesis protein NSA2
Non-structural maintenance of chromosome element 3
Non-structural maintenance of chromosome element 4
RNA polymerase I termination factor
Nucleoporin NSP1
Nuclear localization sequence-binding protein
NuA3 HAT complex component NTO1
Protein NUD1
Kinetochore protein NUF2
Nuclear GTP-binding protein NUG1
Nuclear migration protein NUM1
Nucleoporin NUP116/NSP116
Nucleoporin NUP120
Nucleoporin NUP133
Nucleoporin NUP145;Nucleoporin NUP145N;Nucleoporin NUP145C
Nucleoporin NUP157
Nucleoporin NUP159
Nucleoporin NUP170
Nucleoporin NUP188

Nucleoporin NUP192
Nucleoporin NUP49/NSP49
Nucleoporin NUP57
Nucleoporin NUP82
Nucleoporin NUP84
Nucleoporin NUP85
Nuclear rim protein 1
Mediator of RNA polymerase II transcription subunit 5
Vacuolar v-SNARE NYV1
Oleate-activated transcription factor 1
Oleate activated transcription factor 3
Putative tyrosine-protein phosphatase OCA1
Initiation-specific alpha-1,6-mannosyltransferase
Central kinetochore subunit OKP1
Obg-like ATPase 1
Acyl-CoA desaturase 1
Phosphatidyl-N-methylethanolamine N-methyltransferase
Origin recognition complex subunit 1
Origin recognition complex subunit 2
Origin recognition complex subunit 3
Origin recognition complex subunit 4
Origin recognition complex subunit 5
Origin recognition complex subunit 6
Oxysterol-binding protein homolog 3
Fumarate reductase 2
Dolichyl-diphosphooligosaccharide-protein glycosyltransferase subunit 1
Dolichyl-diphosphooligosaccharide-protein glycosyltransferase subunit 3
Polyamine N-acetyltransferase 1
Polyadenylate-binding protein, cytoplasmic and nuclear
RNA polymerase II-associated protein 1
Protein PAL1
2-dehydropantoate 2-reductase
Poly(A) RNA polymerase protein 2
DNA topoisomerase 2-associated protein PAT1
PAB1-binding protein 1
PAB1-binding protein 2
Protein PBP4
Pyruvate decarboxylase isozyme 1
Protein disulfide-isomerase
Transcription factor PDR1
ATP-dependent permease PDR12
Pleiotropic ABC efflux transporter of multiple drugs
Sister chromatid cohesion protein PDS5
Vacuolar protein sorting/targeting protein VPS10
Vacuolar membrane protein PEP3
Protein PET54
ADP,ATP carrier protein 2
Peroxisomal membrane protein PMP27
Peroxisomal membrane protein import receptor PEX19
ATP-dependent 6-phosphofructokinase subunit alpha
ATP-dependent 6-phosphofructokinase subunit beta
Plasma membrane-associated coenzyme Q6 reductase PGA3
Glucose-6-phosphate isomerase
Phosphoglycerate kinase
Prohibitin-1
Prohibitin-2

Inorganic phosphate transport protein PHO88
Protein interacting with Hsp90 1
Sphingolipid long chain base-responsive protein PIL1
Peroxisome proliferation transcriptional regulator
CDP-diacylglycerol--inositol 3-phosphatidyltransferase
Protein kinase C-like 1
Serine/threonine-protein kinase PKH1
Serine/threonine-protein kinase PKH2
Serine/threonine-protein kinase PKH3
Plasma membrane ATPase 1
Pre-mRNA leakage protein 39
Dolichyl-phosphate-mannose--protein mannosyltransferase 1
Dolichyl-phosphate-mannose--protein mannosyltransferase 2
Dolichyl-phosphate-mannose--protein mannosyltransferase 4
Pre-rRNA-processing protein PNO1
Purine nucleoside phosphorylase
FACT complex subunit POB3
DNA polymerase epsilon catalytic subunit A
DNA polymerase delta catalytic subunit
Proliferating cell nuclear antigen
DNA polymerase delta small subunit
DNA polymerase V
Nucleoporin POM152
Pore membrane protein of 33 kDa
Ribonucleases P/MRP protein subunit POP1
Poly(A) ribonuclease POP2
Acyl-coenzyme A oxidase
Serine/threonine-protein phosphatase PP2A-1 catalytic subunit
Serine/threonine-protein phosphatase PP2A-2 catalytic subunit
Serine/threonine-protein phosphatase PP-Z1
Serine/threonine-protein phosphatase PP-Z2
Proteasome subunit beta type-4
Probable proteasome subunit alpha type-7
Proteasome subunit beta type-5
Proteasome subunit beta type-1
Proteasome subunit beta type-7
Proteasome subunit alpha type-6
Proteasome subunit alpha type-4
Proteasome subunit beta type-6
Proteasome subunit alpha type-2
Proteasome subunit alpha type-3
DNA primase small subunit
Actin-regulating kinase PRK1
Glutamate 5-kinase
Gamma-glutamyl phosphate reductase
Pyrroline-5-carboxylate reductase
Pre-mRNA-processing factor 39
U4/U6 small nuclear ribonucleoprotein PRP4
U1 small nuclear ribonucleoprotein component PRP42
Pre-mRNA-splicing factor ATP-dependent RNA helicase PRP43
Pre-mRNA-splicing factor 8
Serine/threonine-protein kinase PRR1
Eukaryotic translation initiation factor 3 subunit B
Mannose-1-phosphate guanylttransferase
RING finger protein PSH1
Serine/threonine-protein kinase PSK1

Protein PSP2
Phosphatase PSR1
Protein phosphatase 2C homolog 1
Protein phosphatase 2C homolog 3
Serine/threonine-protein kinase PTK2/STK2
Membrane protein PTM1
Nuclear and cytoplasmic polyadenylated RNA-binding protein PUB1
mRNA-binding protein PUF2
mRNA-binding protein PUF3
Pumilio homology domain family member 6
Proteasome subunit beta type-2
Proteasome subunit alpha type-5
Periodic tryptophan protein 2
Protein PXR1
Pyruvate carboxylase 1
Pyruvate carboxylase 2
DNA repair protein RAD16
Flap endonuclease 1
DNA repair protein RAD33
DNA repair protein RAD4
DNA repair protein RAD51
DNA repair and recombination protein RAD52
Trans-acting factor D
Protein farnesyltransferase/geranylgeranyltransferase type-1 subunit alpha
DNA-binding protein RAP1
Ras-like protein 2
Ribosome-interacting GTPase 1
Ribosome-interacting GTPase 2
Serine/threonine-protein kinase RCK2
25S rRNA (cytosine(2278)-C(5))-methyltransferase
Transcriptional regulatory protein RCO1
DNA-binding protein REB1
Partitioning protein REP1
Partitioning protein REP2
DNA-directed RNA polymerase III subunit RPC2
Coatmer subunit delta
Coatmer subunit zeta
RNA exonuclease 4
Replication factor A protein 1
Replication factor A protein 2
Replication factor A protein 3
Replication factor C subunit 1
Replication factor C subunit 2
Replication factor C subunit 3
Replication factor C subunit 4
Replication factor C subunit 5
Protein RFS1
Rho-type GTPase-activating protein 2
RHO GTPase-activating protein RGD1
Guanine nucleotide exchange factor subunit RGP1
Mediator of RNA polymerase II transcription subunit 14
GTP-binding protein RHO1
Telomere length regulator protein RIF1
Serine/threonine-protein kinase RIM11/MSD1
Serine/threonine-protein kinase RIO1
Serine/threonine-protein kinase RIO2

Ribosome biogenesis ATPase RIX7
Ribosomal lysine N-methyltransferase 2
Chromatin assembly factor 1 subunit p90
Translation initiation factor RLI1
Transcription factor RLM1
Ribosome biogenesis protein RLP24
Ribosome biogenesis protein RLP7
Protein arginine N-methyltransferase 2
Ran GTPase-activating protein 1
Ribonucleoside-diphosphate reductase large chain 1
Ribonucleoside-diphosphate reductase small chain 1
Ribonucleoside-diphosphate reductase small chain 2
Ribonuclease T2-like
ATP-dependent RNA helicase ROK1
RHO1 GDP-GTP exchange protein 2
DNA-directed RNA polymerase I subunit RPA12
DNA-directed RNA polymerase I subunit RPA135
DNA-directed RNA polymerase I subunit RPA14
DNA-directed RNA polymerase I subunit RPA190
DNA-directed RNA polymerase I subunit RPA34
DNA-directed RNA polymerase I subunit RPA43
DNA-directed RNA polymerase I subunit RPA49
DNA-directed RNA polymerases I, II, and III subunit RPABC5
DNA-directed RNA polymerase II subunit RPB11
DNA-directed RNA polymerase II subunit RPB2
DNA-directed RNA polymerase II subunit RPB3
DNA-directed RNA polymerase II subunit RPB4
DNA-directed RNA polymerases I, II, and III subunit RPABC1
DNA-directed RNA polymerases I, II, and III subunit RPABC3
DNA-directed RNA polymerases I, II, and III subunit RPABC4
DNA-directed RNA polymerase III subunit RPC9
DNA-directed RNA polymerases I and III subunit RPAC2
DNA-directed RNA polymerase III subunit RPC8
DNA-directed RNA polymerase III subunit RPC7
DNA-directed RNA polymerase III subunit RPC6
DNA-directed RNA polymerase III subunit RPC5
DNA-directed RNA polymerases I and III subunit RPAC1
DNA-directed RNA polymerase III subunit RPC4
DNA-directed RNA polymerase III subunit RPC3
Histone deacetylase RPD3
Ribosome production factor 1
Ribosome biogenesis protein RPF2
Eukaryotic translation initiation factor 3 subunit A
DNA damage-responsive transcriptional repressor RPH1
60S ribosomal protein L10
60S ribosomal protein L11-B;60S ribosomal protein L11-A
60S ribosomal protein L12-B;60S ribosomal protein L12-A
60S ribosomal protein L13-B;60S ribosomal protein L13-A
60S ribosomal protein L14-A
60S ribosomal protein L15-A
60S ribosomal protein L16-A
60S ribosomal protein L16-B
60S ribosomal protein L17-A
60S ribosomal protein L18-B;60S ribosomal protein L18-A
60S ribosomal protein L19-B;60S ribosomal protein L19-A
60S ribosomal protein L1-B;60S ribosomal protein L1-A

60S ribosomal protein L20-B;60S ribosomal protein L20-A
60S ribosomal protein L21-A
60S ribosomal protein L21-B
60S ribosomal protein L22-A
60S ribosomal protein L23-B;60S ribosomal protein L23-A
60S ribosomal protein L24-A
60S ribosomal protein L25
60S ribosomal protein L26-A
60S ribosomal protein L26-B
60S ribosomal protein L27-B;60S ribosomal protein L27-A
60S ribosomal protein L28
60S ribosomal protein L2-B;60S ribosomal protein L2-A
60S ribosomal protein L3
60S ribosomal protein L30
60S ribosomal protein L31-A
60S ribosomal protein L32
60S ribosomal protein L33-A
60S ribosomal protein L33-B
60S ribosomal protein L34-A;60S ribosomal protein L34-B
60S ribosomal protein L35-B;60S ribosomal protein L35-A
60S ribosomal protein L36-B;60S ribosomal protein L36-A
60S ribosomal protein L37-A
60S ribosomal protein L38
60S ribosomal protein L39
60S ribosomal protein L42-B;60S ribosomal protein L42-A
60S ribosomal protein L43-B;60S ribosomal protein L43-A
60S ribosomal protein L4-A
60S ribosomal protein L4-B
60S ribosomal protein L5
60S ribosomal protein L6-A
60S ribosomal protein L6-B
60S ribosomal protein L7-A
60S ribosomal protein L8-A
60S ribosomal protein L8-B
60S ribosomal protein L9-A
60S ribosomal protein L9-B
26S proteasome regulatory subunit RPN1
26S proteasome regulatory subunit RPN10
26S proteasome regulatory subunit RPN12
26S proteasome regulatory subunit RPN13
26S proteasome regulatory subunit RPN2
26S proteasome regulatory subunit RPN3
26S proteasome regulatory subunit RPN5
26S proteasome regulatory subunit RPN6
26S proteasome regulatory subunit RPN7
26S proteasome regulatory subunit RPN8
26S proteasome regulatory subunit RPN9
DNA-directed RNA polymerase II subunit RPB1
DNA-directed RNA polymerases I, II, and III subunit RPABC2
DNA-directed RNA polymerase III subunit RPC1
60S acidic ribosomal protein P0
Ribonuclease P/MRP protein subunit RPP1
60S acidic ribosomal protein P1-alpha
60S acidic ribosomal protein P2-alpha
60S acidic ribosomal protein P2-beta
40S ribosomal protein S0-B;40S ribosomal protein S0-A

40S ribosomal protein S10-A;40S ribosomal protein S10-B
40S ribosomal protein S11-B;40S ribosomal protein S11-A
40S ribosomal protein S12
40S ribosomal protein S13
40S ribosomal protein S14-A
40S ribosomal protein S15
40S ribosomal protein S16-B;40S ribosomal protein S16-A
40S ribosomal protein S17-B;40S ribosomal protein S17-A
40S ribosomal protein S18-B;40S ribosomal protein S18-A
40S ribosomal protein S19-B;40S ribosomal protein S19-A
40S ribosomal protein S1-A
40S ribosomal protein S1-B
40S ribosomal protein S2
40S ribosomal protein S20
40S ribosomal protein S21-B
40S ribosomal protein S22-B;40S ribosomal protein S22-A
40S ribosomal protein S23-B;40S ribosomal protein S23-A
40S ribosomal protein S24-B;40S ribosomal protein S24-A
40S ribosomal protein S25-A;40S ribosomal protein S25-B
40S ribosomal protein S26-B;40S ribosomal protein S26-A
40S ribosomal protein S27-B;40S ribosomal protein S27-A
40S ribosomal protein S28-A;40S ribosomal protein S28-B
40S ribosomal protein S29-A
40S ribosomal protein S29-B
40S ribosomal protein S3
40S ribosomal protein S30-B;40S ribosomal protein S30-A
Ubiquitin-40S ribosomal protein S31;Ubiquitin;40S ribosomal protein S31;Polyubiquitin;Ubiquitin
40S ribosomal protein S4-B;40S ribosomal protein S4-A
40S ribosomal protein S5
40S ribosomal protein S6-B;40S ribosomal protein S6-A
40S ribosomal protein S7-A
40S ribosomal protein S7-B
40S ribosomal protein S8-B;40S ribosomal protein S8-A
40S ribosomal protein S9-B
26S protease regulatory subunit 7 homolog
26S protease subunit RPT4
Ribosome quality control complex subunit 2
Ribosome assembly protein RRB1
ATP-dependent DNA helicase RRM3
RNA polymerase I-specific transcription initiation factor RRN10
RNA polymerase I-specific transcription initiation factor RRN5
RNA polymerase I-specific transcription initiation factor RRN9
Ribosomal RNA-processing protein 1
Ribosomal RNA-processing protein 12
Ribosomal RNA-processing protein 15
Ribosomal RNA-processing protein 17
ATP-dependent rRNA helicase RRP3
Exosome complex component RRP42
rRNA biogenesis protein RRP5
Exosome complex exonuclease RRP6
Ribosomal RNA-processing protein 7
25S rRNA (adenine(645)-N(1))-methyltransferase
Ribosomal RNA-processing protein 9
Regulator of ribosome biosynthesis
Regulator of rDNA transcription protein 14
Ribosome assembly protein 3

Chromatin structure-remodeling complex subunit RSC1
Chromatin structure-remodeling complex subunit RSC2
Chromatin structure-remodeling complex protein RSC3
Chromatin structure-remodeling complex protein RSC30
Chromatin structure-remodeling complex subunit RSC4
Chromatin structure-remodeling complex protein RSC58
Chromatin structure-remodeling complex protein RSC6
Chromatin structure-remodeling complex protein RSC8
Chromatin structure-remodeling complex subunit RSC9
Pre-mRNA-splicing factor RSE1
E3 ubiquitin-protein ligase RSP5
RNA polymerase-associated protein RTF1
Retrograde regulation protein 3
Probable serine/threonine-protein kinase RTK1
Reticulon-like protein 1
RNA polymerase II assembly factor RTP1
Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit delta isoform
Regulator of Ty1 transposition protein 102
Regulator of Ty1 transposition protein 103
Histone chaperone RTT106
Regulator of Ty1 transposition protein 107
RuvB-like protein 1
RuvB-like protein 2
Transcriptional regulatory protein RXT2
Phosphoinositide phosphatase SAC1
GTPase-activating protein SAC7
Small COPII coat GTPase SAR1
Something about silencing protein 10
Histone acetyltransferase SAS3
Something about silencing protein 4
Something about silencing protein 5
Co-chaperone protein SBA1
Single-stranded nucleic acid-binding protein
Sister chromatid cohesion protein 2
Protein SCD6
Intron-encoded endonuclease I-SceI
Serine/threonine-protein kinase SCH9
Proteasome subunit alpha type-1
Protein SCP160
Vesicle-associated membrane protein-associated protein SCS2
Glycerol-3-phosphate O-acyltransferase 1
Protein phosphatase 1 regulatory subunit SDS22
Protein transport protein SEC1
Protein transport protein SEC13
COPII coat assembly protein SEC16
Rab guanine nucleotide exchange factor SEC2
Coatomer subunit gamma
Protein transport protein SEC23
Coatomer subunit beta
Coatomer subunit beta
Coatomer subunit epsilon
Protein transport protein SEC31
Phosphomannomutase
Protein translocation protein SEC63
Putative guanine nucleotide-exchange factor SED4
Eisosome protein SEG1

Nucleoporin SEH1
Helicase SEN1
Phosphoserine aminotransferase
Serine--tRNA ligase, cytoplasmic
Histone-lysine N-methyltransferase, H3 lysine-36 specific
SED5-binding protein 3
Chromatin structure-remodeling complex subunit SFH1
Protein arginine N-methyltransferase SFM1
RNA-binding protein SGN1
ATP-dependent helicase SGS1
Serine/threonine-protein kinase BUR1
SWI5-dependent HO expression protein 3
Serine hydroxymethyltransferase, cytosolic
SIR4-interacting protein SIF2
Transcriptional regulatory protein SIN3
Protein SIP5
NAD-dependent histone deacetylase SIR2
Regulatory protein SIR3
Protein SIS1
Serine/threonine-protein phosphatase PP1-1
Superkiller protein 3
Transcription factor SKN7
CRE-binding bZIP protein SKO1
Suppressor of kinetochore protein 1
Serine/threonine-protein kinase SKY1
Actin cytoskeleton-regulatory complex protein SLA1
Probable 1-acyl-sn-glycerol-3-phosphate acyltransferase
DNA replication regulator SLD3
Small nuclear ribonucleoprotein-associated protein B
Structural maintenance of chromosomes protein 1
Structural maintenance of chromosomes protein 2
Structural maintenance of chromosomes protein 3
Structural maintenance of chromosomes protein 4
Structural maintenance of chromosomes protein 5
Structural maintenance of chromosomes protein 6
Small nuclear ribonucleoprotein Sm D1
Small nuclear ribonucleoprotein Sm D2
Small nuclear ribonucleoprotein Sm D3
Transcription factor SMP1
Small nuclear ribonucleoprotein F
Carbon catabolite-derepressing protein kinase
Transcription regulatory protein SNF12
Transcription regulatory protein SNF2
SWI/SNF chromatin-remodeling complex subunit SNF5
Transcription regulatory protein SNF6
Vacuolar-sorting protein SNF7
HSP70 co-chaperone SNL1
U1 small nuclear ribonucleoprotein 70 kDa homolog
Protein SNQ2
Probable DNA-binding protein SNT1
Pre-mRNA-splicing factor SNU114
13 kDa ribonucleoprotein-associated protein
56 kDa U1 small nuclear ribonucleoprotein component
U1 small nuclear ribonucleoprotein component SNU71
Protein SOF1
27S pre-rRNA (guanosine(2922)-2-O)-methyltransferase

ATP-dependent rRNA helicase SPB4
Spindle pole body component SPC105
Spindle pole body component 110
Kinetochore protein SPC25
Spindle pole component 29
Spindle pole body component SPC42
Spindle pole component SPC72
Spindle pole body component SPC97
Spindle pole body component SPC98
Manganese-transporting ATPase 1
Transcription factor SPN1
COMPASS component SPP1
Peroxisomal 2,4-dienoyl-CoA reductase SPS19
TATA-box-binding protein
FACT complex subunit SPT16
Transcription factor SPT20
Protein SPT23
Protein SPT3
Transcription elongation factor SPT4
Transcription elongation factor SPT5
Transcription elongation factor SPT6
Transcriptional activator SPT7
Transcription factor SPT8
Mediator of RNA polymerase II transcription subunit 20
Mediator of RNA polymerase II transcription subunit 17
Guanine nucleotide exchange factor SRM1
RNA-binding protein SRO9
Importin subunit alpha
Signal recognition particle receptor subunit alpha homolog
Signal recognition particle receptor subunit beta
Signal recognition particle subunit SRP21
Suppressor protein SRP40
Signal recognition particle subunit SRP54
Signal recognition particle subunit SRP68
Signal recognition particle subunit SRP72
ATP-dependent DNA helicase SRS2
Adenylyl cyclase-associated protein
Protein SSD1
Heat shock protein homolog SSE1
Ribosome biogenesis protein SSF1
RNA polymerase II subunit A C-terminal domain phosphatase SSU72
Ribosome-associated complex subunit SSZ1
Probable transcriptional regulatory protein STB4
Serine/threonine-protein kinase STE11
Protein STE12
Serine/threonine-protein kinase STE20
CAAX prenyl protease 1
Guanine nucleotide-binding protein subunit beta
Serine/threonine-protein kinase STE7
Nuclear protein STH1/NPS1
Heat shock protein STI1
Suppressor protein STM1
Nuclear cap-binding protein complex subunit 1
Suppressor protein STP22 of temperature-sensitive alpha-factor receptor and arginine permease
Zinc finger protein STP3
Zinc finger protein STP4

Dolichyl-diphosphooligosaccharide–protein glycosyltransferase subunit STT3
Transcription initiation factor IIB
RNA polymerase II transcriptional coactivator SUB1
ATP-dependent RNA helicase SUB2
Eukaryotic translation initiation factor 2 subunit alpha
Eukaryotic translation initiation factor 2 subunit beta
Suppressor of mar1-1 protein
Eukaryotic peptide chain release factor GTP-binding subunit
Protein SUR7
Survival factor 1
Styryl dye vacuolar localization protein 3
SWR1-complex protein 4
COMPASS component SWD2
SWI/SNF chromatin-remodeling complex subunit SWI1
SWI/SNF complex subunit SWI3
Regulatory protein SWI4
Transcriptional factor SWI5
Nucleolar protein SWM2
Dolichyl-diphosphooligosaccharide–protein glycosyltransferase subunit SWP1
SWI/SNF global transcription activator complex subunit SWP82
Helicase SWR1
SMY2 homolog 2
Suppressor of yeast profilin deletion
Transcription initiation factor TFIID subunit 1
Transcription initiation factor TFIID subunit 10
Transcription initiation factor TFIID subunit 11
Transcription initiation factor TFIID subunit 12
Transcription initiation factor TFIID subunit 14
Transcription initiation factor TFIID subunit 2
Transcription initiation factor TFIID subunit 3
Transcription initiation factor TFIID subunit 4
Transcription initiation factor TFIID subunit 5
Transcription initiation factor TFIID subunit 6
Transcription initiation factor TFIID subunit 7
Transcription initiation factor TFIID subunit 8
Transcription initiation factor TFIID subunit 9
tRNA acetyltransferase TAN1
Cell morphogenesis protein PAG1
Protein TBF1
Tricalbin-1
Tricalbin-2
Tricalbin-3
tRNA threonylcarbamoyladenosine dehydratase 2
Target of rapamycin complex 1 subunit TCO89
Probable transcription factor TDA9
Ty transcription activator TEC1
Elongation factor 1-alpha
Elongation factor 1-gamma 2
Telomere length regulation protein TEL2
Peroxisomal acyl-coenzyme A thioester hydrolase 1
Transcription factor tau 95 kDa subunit
Transcription factor tau 138 kDa subunit
Transcription factor tau 131 kDa subunit
Transcription factor tau 91 kDa subunit
Transcription factor tau 55 kDa subunit
Transcription factor tau 60 kDa subunit

Trimethylguanosine synthase
tRNA(His) guanylyltransferase
ATP-dependent RNA helicase eIF4A
Eukaryotic translation initiation factor 1A
Eukaryotic translation initiation factor 4B
Eukaryotic translation initiation factor 3 subunit I
Eukaryotic translation initiation factor 3 subunit G
Eukaryotic initiation factor 4F subunit p150
Eukaryotic translation initiation factor 5
Eukaryotic translation initiation factor 6
Transketolase 1
Transketolase 2
Translation machinery-associated protein 16
Translationally-controlled tumor protein homolog
Protein TMA23
Translation machinery-associated protein 46
Translation machinery-associated protein 64
Transcription initiation factor IIA subunit 2
Transcriptional regulatory protein TOD6
Topoisomerase 1-associated factor 2
E3 ubiquitin-protein ligase TOM1
Protein TOM71
DNA topoisomerase 1
DNA topoisomerase 2
Serine/threonine-protein kinase TOR1
Serine/threonine-protein kinase TOR2
Protein phosphatase PP2A regulatory subunit A
Triosephosphate isomerase
tRNA 2-phosphotransferase
Transcription-associated protein 1
tRNA (guanosine(18)-2-O)-methyltransferase
tRNA (cytidine(32)-2-O)-methyltransferase non-catalytic subunit TRM732
Tryptophan synthase
Thioredoxin reductase 1
Trafficking protein particle complex subunit 33
Peroxiredoxin TSA1
Target of rapamycin complex 2 subunit TSC11
Very-long-chain enoyl-CoA reductase
Ribosome biogenesis protein TSR1
Ribosome biogenesis protein TSR3
Thiosulfate sulfurtransferase TUM1
General transcriptional corepressor TUP1
Golgi apparatus membrane protein TVP18
Transposon Ty1-GR1 Gag polyprotein;Capsid protein
Transposon Ty1-JR2 Gag polyprotein;Capsid protein;Gag-p4
Transposon Ty1-LR3 Gag-Pol polyprotein;Capsid protein;Ty1 protease;Integrase;Reverse transcriptase/ribonuclease H
Transposon Ty1-ML2 Gag-Pol polyprotein;Capsid protein;Ty1 protease;Integrase;Reverse transcriptase/ribonuclease H
Transposon Ty1-PL Gag-Pol polyprotein;Capsid protein;Ty1 protease;Integrase;Reverse transcriptase/ribonuclease H;Transposon Ty1-IR
Transposon Ty1-PR1 Gag-Pol polyprotein;Capsid protein;Ty1 protease;Integrase;Reverse transcriptase/ribonuclease H
Transposon Ty1-PR2 Gag-Pol polyprotein;Capsid protein;Ty1 protease;Integrase;Reverse transcriptase/ribonuclease H
Upstream activation factor subunit UAF30
Adenylyltransferase and sulfurtransferase UBA4;Adenylyltransferase UBA4;Sulfurtransferase UBA4
Ubiquitin carboxyl-terminal hydrolase 10
Ubiquitin carboxyl-terminal hydrolase 15
4-aminobutyrate aminotransferase
Transcriptional activator protein UGA3

ATP-dependent helicase ULS1
Transcriptional regulatory protein UME1
Transcriptional regulatory protein UME6
Protein URA2;Glutamine-dependent carbamoyl-phosphate synthase;Aspartate carbamoyltransferase
Orotate phosphoribosyltransferase 1
CTP synthase 1
CTP synthase 2
Nucleolar pre-ribosomal-associated protein 1
Nucleolar pre-ribosomal-associated protein 2
Uracil catabolism protein 2
Transcriptional regulator URE2
Nutrient and stress factor 1
U3 small nucleolar RNA-associated protein 10
U3 small nucleolar RNA-associated protein 11
U3 small nucleolar RNA-associated protein 13
U3 small nucleolar RNA-associated protein 14
U3 small nucleolar RNA-associated protein 15
U3 small nucleolar RNA-associated protein 18
U3 small nucleolar RNA-associated protein 20
U3 small nucleolar RNA-associated protein 21
U3 small nucleolar RNA-associated protein 22
rRNA-processing protein UTP23
U3 small nucleolar RNA-associated protein 25
Ribosome biogenesis protein UTP30
U3 small nucleolar RNA-associated protein 4
U3 small nucleolar RNA-associated protein 5
U3 small nucleolar RNA-associated protein 6
U3 small nucleolar RNA-associated protein 7
U3 small nucleolar RNA-associated protein 8
U3 small nucleolar RNA-associated protein 9
Vacuolar protein 8
Vacuolar morphogenesis protein 6
Vacuolar calcium ion transporter
Transcription factor VHR2
Vacuolar import and degradation protein 22
Vacuolar import and degradation protein 27
Vacuolar import and degradation protein 30
Inositol hexakisphosphate and diphosphoinositol-pentakisphosphate kinase
V-type proton ATPase catalytic subunit A;Endonuclease PI-SceI
V-type proton ATPase subunit H
V-type proton ATPase subunit B
V-type proton ATPase subunit E
V-type proton ATPase subunit C
V-type proton ATPase subunit d
V-type proton ATPase subunit a, vacuolar isoform
Vacuolar ATPase assembly integral membrane protein VPH2
Vacuolar protein sorting-associated protein 1
Vacuolar protein sorting-associated protein 13
Vacuolar protein sorting-associated protein 16
Vacuolar protein sorting-associated protein 17
Vacuolar protein sorting-associated protein 21
Vacuolar protein sorting-associated protein 30
Vacuolar protein sorting-associated protein 33
Vacuolar protein sorting-associated protein 4
Vacuolar protein sorting-associated protein 41
Vacuolar protein sorting-associated protein 64

Vacuolar protein sorting-associated protein 71
Vacuolar protein sorting-associated protein 72
Vacuolar protein sorting-associated protein 74
Vacuolar transporter chaperone 2
Vacuolar transporter chaperone 4
Protein VTS1
Dolichyl-diphosphooligosaccharide-protein glycosyltransferase subunit WBP1
Transcriptional modulator WTM1
Transcriptional repressor XBP1
DnaJ protein homolog XDJ1
Xanthine phosphoribosyltransferase 1
5-3 exoribonuclease 1
Protein AF-9 homolog
AP-1-like transcription factor YAP1
AP-1-like transcription factor YAP3
Carnitine O-acetyltransferase YAT2
Metal resistance protein YCF1
Condensin complex subunit 3
Casein kinase I homolog 1
Casein kinase I homolog 2
Casein kinase I homolog 3
Condensin complex subunit 1
Uncharacterized membrane protein YDL218W
Elongation factor 3A
Endoplasmic reticulum transmembrane protein 1
Endoplasmic reticulum transmembrane protein 3
Uncharacterized transcriptional regulatory protein YFL052W
Uncharacterized membrane protein YGL140C
Uncharacterized membrane protein YGR026W
Eukaryotic translation initiation factor 2A
Uncharacterized RNA-binding protein YGR250C
Flavohemoprotein
U1 small nuclear ribonucleoprotein C
ATP-dependent DNA helicase II subunit 1
ATP-dependent DNA helicase II subunit 2
Uncharacterized transcriptional regulatory protein YLR278C
Uncharacterized membrane protein YLR312C
Putative ATP-dependent RNA helicase YLR419W
DOCK-like protein YLR422W
PWWP domain-containing protein YLR455W
Uncharacterized membrane protein YML131W
Uncharacterized oxidoreductase YMR226C
Protein YNG1
Nucleoside diphosphate kinase
Uncharacterized vacuolar membrane protein YNL115C
UPF0674 endoplasmic reticulum membrane protein YNR021W
Serine/threonine-protein kinase YPK1
Serine/threonine-protein kinase YPK2/YKR2
Putative serine/threonine-protein kinase YPL150W
Cargo-transport protein YPP1
Putative reductase 1
Putative pyridoxal reductase
RNA annealing protein YRA1
Ran-specific GTPase-activating protein 1
Zinc finger transcription factor YRR1
Protein YSP1

Tat-binding homolog 7
Ribosome biogenesis protein YTM1
Calcium channel YVC1
Zinc finger protein ZPR1
Zinc/cadmium resistance protein
Zinc-regulated transporter 1
Probable quinone oxidoreductase
Zuotin
NADPH-dependent alpha-keto amide reductase
Protein-glutamate O-methyltransferase

Mitochondrial intermediate peptidase
Aspartate aminotransferase, mitochondrial
ARS-binding factor 2, mitochondrial
Acetyl-CoA hydrolase
Aconitate hydratase, mitochondrial
Homocitrate dehydratase, mitochondrial
Acetyl-coenzyme A synthetase 1
Alcohol dehydrogenase 3, mitochondrial
Alcohol dehydrogenase 4
GTP:AMP phosphotransferase, mitochondrial
ATPase expression protein 1, mitochondrial
ATPase expression protein 2, mitochondrial
ATPase expression protein 3
Protein AFG1
Mitochondrial respiratory chain complexes assembly protein AFG3
Alanine--glyoxylate aminotransferase 1
Altered inheritance of mitochondria protein 19, mitochondrial
Altered inheritance of mitochondria protein 24, mitochondrial
Altered inheritance rate of mitochondria protein 25
Altered inheritance of mitochondria protein 36, mitochondrial
Altered inheritance of mitochondria protein 41, mitochondrial
Probable electron transfer flavoprotein subunit alpha, mitochondrial
Altered inheritance of mitochondria protein 46, mitochondrial
Altered inheritance of mitochondria protein 9, mitochondrial
Alanine--tRNA ligase, mitochondrial
Potassium-activated aldehyde dehydrogenase, mitochondrial
Aldehyde dehydrogenase 5, mitochondrial
D-arabinono-1,4-lactone oxidase
Probable alanine aminotransferase, mitochondrial
Aminopeptidase 2, mitochondrial
Amino-acid acetyltransferase, mitochondrial
Protein ARG5,6, mitochondrial;N-acetyl-gamma-glutamyl-phosphate reductase;Acetylglutamate kinase
Arginine biosynthesis bifunctional protein ArgJ, mitochondrial;Glutamate N-acetyltransferase;Amino-acid acetyltransferase;Arginine
ATP synthase subunit alpha, mitochondrial
Mitochondrial ATPase complex subunit ATP10
Protein ATP11, mitochondrial
ATP synthase subunit epsilon, mitochondrial
ATP synthase subunit delta, mitochondrial
ATP synthase subunit f, mitochondrial
ATP synthase subunit beta, mitochondrial
ATP synthase subunit g, mitochondrial
Mitochondrial inner membrane protease ATP23
ATPase synthesis protein 25, mitochondrial
ATP synthase subunit gamma, mitochondrial
ATP synthase subunit 4, mitochondrial

ATP synthase subunit 5, mitochondrial
ATP synthase subunit d, mitochondrial
Branched-chain-amino-acid aminotransferase, mitochondrial
Biotin synthase, mitochondrial
Carnitine O-acetyltransferase, mitochondrial
5-demethoxyubiquinone hydroxylase, mitochondrial
Centromere-binding protein 1
Cytochrome B pre-mRNA-processing protein 1
Cytochrome B pre-mRNA-processing protein 2
Protein CBP3, mitochondrial
Assembly factor CBP4
Cytochrome B pre-mRNA-processing protein 6
Cytochrome b translational activator protein CBS1, mitochondrial
Cruciform cutting endonuclease 1, mitochondrial
Mitochondrial group I intron splicing factor CCM1
Cytochrome c peroxidase, mitochondrial
Probable electron transfer flavoprotein-ubiquinone oxidoreductase, mitochondrial
Citrate synthase, mitochondrial
Citrate synthase 3
Cytochrome c oxidase assembly factor 1
Hexaprenyl pyrophosphate synthase, mitochondrial
Coenzyme Q-binding protein COQ10, mitochondrial
Ubiquinone biosynthesis O-methyltransferase, mitochondrial
Ubiquinone biosynthesis protein COQ4, mitochondrial
2-methoxy-6-polyprenyl-1,4-benzoquinol methylase, mitochondrial
Ubiquinone biosynthesis monooxygenase COQ6, mitochondrial
Atypical kinase COQ8, mitochondrial
Ubiquinone biosynthesis protein COQ9, mitochondrial
Cytochrome b-c1 complex subunit 1, mitochondrial
Cytochrome c oxidase subunit 6B
Cytochrome c oxidase subunit 6A, mitochondrial
Cytochrome c oxidase assembly protein COX15
Cytochrome c oxidase subunit 2
Cytochrome c oxidase subunit 4, mitochondrial
Cytochrome c oxidase polypeptide 5A, mitochondrial
Cytochrome c oxidase subunit 6, mitochondrial
Peptidyl-prolyl cis-trans isomerase C, mitochondrial
Mitochondrial carnitine carrier
Peroxisomal catalase A
Tricarboxylate transport protein
Cytochrome b2, mitochondrial
Cytochrome c iso-1
Cytochrome c mitochondrial import factor CYC2
Mitochondrial presequence protease
Cytochrome c1, heme protein, mitochondrial
Mitochondrial dicarboxylate transporter
D-lactate dehydrogenase [cytochrome] 1, mitochondrial
D-lactate dehydrogenase [cytochrome] 2, mitochondrial
Exoribonuclease II, mitochondrial
Cys-Gly metallodipeptidase DUG1
Protein EFR3
3-hydroxyisobutyryl-CoA hydrolase, mitochondrial
Medium-chain fatty acid ethyl ester synthase/esterase 2
Enolase 1
Squalene synthase
Protein ERP1

Enoyl-[acyl-carrier protein] reductase [NADPH, B-specific], mitochondrial
Long-chain-fatty-acid--CoA ligase 1
Long-chain-fatty-acid--CoA ligase 2
5-formyltetrahydrofolate cyclo-ligase
Fructose-bisphosphate aldolase
Mitochondria fission 1 protein
ATP synthase assembly factor FMC1, mitochondrial
Uncharacterized mitochondrial membrane protein FMP10
Protein FMP27, mitochondrial
Uncharacterized mitochondrial hydrolase FMP41
Putative redox protein FMP46, mitochondrial
Protein FMP52, mitochondrial
Probable mitochondrial transport protein FSF1
Fumarate hydratase, mitochondrial
Aminomethyltransferase, mitochondrial
Glycine dehydrogenase (decarboxylating), mitochondrial
Glycine cleavage system H protein, mitochondrial
Glycogen debranching enzyme;4-alpha-glucanotransferase;Amylo-alpha-1,6-glucosidase
NAD-specific glutamate dehydrogenase
NADP-specific glutamate dehydrogenase 2
Genetic interactor of prohibitin 5, mitochondrial
Genetic interactor of prohibitin 7, mitochondrial
Mitochondrial GTP/GDP carrier protein 1
Glutamate synthase [NADH]
6-phosphogluconate dehydrogenase, decarboxylating 1
Glycerol-3-phosphate dehydrogenase [NAD(+)] 2, mitochondrial
Glycine--tRNA ligase 1, mitochondrial
Glutaredoxin-2, mitochondrial
Monothiol glutaredoxin-5, mitochondrial
Glycogen [starch] synthase isoform 1
Translation factor GUF1, mitochondrial
Glycerol kinase
Glycerol-3-phosphate dehydrogenase, mitochondrial
5-aminolevulinate synthase, mitochondrial
Protoporphyrinogen oxidase
Ferrochelataase, mitochondrial
Glutamyl-tRNA(Gln) amidotransferase subunit A, mitochondrial
Fatty aldehyde dehydrogenase HFD1
10 kDa heat shock protein, mitochondrial
Heat shock protein 60, mitochondrial
Heat shock protein 78, mitochondrial
Hydroxyacyl-thioester dehydratase type 2, mitochondrial
Histidine--tRNA ligase, mitochondrial
Mitochondrial 2-methylisocitrate lyase
Isocitrate dehydrogenase [NAD] subunit 1, mitochondrial
Isocitrate dehydrogenase [NAD] subunit 2, mitochondrial
Isocitrate dehydrogenase [NADP], mitochondrial
Translation initiation factor IF-2, mitochondrial
Threonine dehydratase, mitochondrial
Acetolactate synthase catalytic subunit, mitochondrial
Dihydroxy-acid dehydratase, mitochondrial
Ketol-acid reductoisomerase, mitochondrial
Acetolactate synthase small subunit, mitochondrial
54S ribosomal protein IMG1, mitochondrial
54S ribosomal protein IMG2, mitochondrial
Mitochondrial outer membrane protein IML2

Abhydrolase domain-containing protein IMO32
Inhibitory regulator protein IRA1
Inhibitory regulator protein IRA2
Protein ISD11
Protein JSN1
2-oxoglutarate dehydrogenase, mitochondrial
Dihydrolipoyllysine-residue succinyltransferase component of 2-oxoglutarate dehydrogenase complex, mitochondrial
Target of rapamycin complex 1 subunit KOG1
Cysteine proteinase 1, mitochondrial
Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex, mitochondrial
2-isopropylmalate synthase
Lipoyl synthase, mitochondrial
Dihydrolipoyl dehydrogenase, mitochondrial
Succinyl-CoA ligase [ADP-forming] subunit alpha, mitochondrial
Succinyl-CoA ligase [ADP-forming] subunit beta, mitochondrial
Homoisocitrate dehydrogenase, mitochondrial
Homocitrate synthase, mitochondrial;Homocitrate synthase, cytosolic isozyme
Homoaconitase, mitochondrial
NAD-dependent malic enzyme, mitochondrial
Mitochondrial acidic protein MAM33
Mitochondrial-processing peptidase subunit beta
Mitochondrial-processing peptidase subunit alpha
Inner membrane mitoribosome receptor MBA1, mitochondrial
Malonyl CoA-acyl carrier protein transacylase, mitochondrial
Mitochondrial clpX-like chaperone MCX1
Malate dehydrogenase, mitochondrial
DnaJ homolog 1, mitochondrial
Mitochondrial distribution and morphology protein 38
Elongation factor G, mitochondrial
Probable proline-tRNA ligase, mitochondrial
Sulfate adenylyltransferase
Dynamin-like GTPase MGM1, mitochondrial;Dynamin-like GTPase MGM1 large isoform;Dynamin-like GTPase MGM1 small isoform
Mitochondrial genome maintenance protein MGM101
Mitochondrial inner membrane i-AAA protease supercomplex subunit MGR1
Mitochondrial homologous recombination protein 1
Mitochondrial phosphate carrier protein;Mitochondrial phosphate carrier protein, N-terminally processed
C-1-tetrahydrofolate synthase, mitochondrial;Methylenetetrahydrofolate dehydrogenase;Methenyltetrahydrofolate cyclohydrolase;f
Protein MMF1, mitochondrial
Protein MNE1
54S ribosomal protein L12, mitochondrial
tRNA dimethylallyltransferase, mitochondrial
Mitochondrial peculiar membrane protein 1
Protein MRH1
ATP-dependent RNA helicase MRH4, mitochondrial
rRNA methyltransferase 1, mitochondrial
37S ribosomal protein MRP1, mitochondrial
37S ribosomal protein MRP13, mitochondrial
37S ribosomal protein MRP17, mitochondrial
37S ribosomal protein MRP2, mitochondrial
54S ribosomal protein L41, mitochondrial
37S ribosomal protein MRP4, mitochondrial
54S ribosomal protein MRP49, mitochondrial
37S ribosomal protein MRP51, mitochondrial
54S ribosomal protein L2, mitochondrial
Uncharacterized protein MRP8
54S ribosomal protein L1, mitochondrial

54S ribosomal protein L10, mitochondrial
54S ribosomal protein L11, mitochondrial
54S ribosomal protein L13, mitochondrial
54S ribosomal protein L15, mitochondrial
54S ribosomal protein L16, mitochondrial
54S ribosomal protein L17, mitochondrial
54S ribosomal protein L19, mitochondrial
54S ribosomal protein L20, mitochondrial
54S ribosomal protein L22, mitochondrial
54S ribosomal protein L23, mitochondrial
54S ribosomal protein L24, mitochondrial
54S ribosomal protein L25, mitochondrial
54S ribosomal protein L28, mitochondrial
54S ribosomal protein L3, mitochondrial
54S ribosomal protein L31, mitochondrial
54S ribosomal protein L35, mitochondrial
54S ribosomal protein L36, mitochondrial
54S ribosomal protein L38, mitochondrial;54S ribosomal protein L34, mitochondrial
54S ribosomal protein L4, mitochondrial
54S ribosomal protein L40, mitochondrial
54S ribosomal protein L49, mitochondrial
54S ribosomal protein L51, mitochondrial
54S ribosomal protein L6, mitochondrial
54S ribosomal protein L7, mitochondrial
54S ribosomal protein L8, mitochondrial
54S ribosomal protein L9, mitochondrial
37S ribosomal protein S16, mitochondrial
37S ribosomal protein S17, mitochondrial
37S ribosomal protein S18, mitochondrial
37S ribosomal protein S28, mitochondrial
37S ribosomal protein S35, mitochondrial
37S ribosomal protein S5, mitochondrial
37S ribosomal protein S8, mitochondrial
37S ribosomal protein S9, mitochondrial
Mitochondrial RNA-splicing protein MRS1
Meiotic sister-chromatid recombination protein 6, mitochondrial
Aspartate--tRNA ligase, mitochondrial
DNA mismatch repair protein MSH1, mitochondrial
Protein MSP1
ATP-dependent RNA helicase MSS116, mitochondrial
Protein MSS18
Protein MSS2, mitochondrial
Protein MSS51, mitochondrial
Threonine--tRNA ligase, mitochondrial
Tryptophan--tRNA ligase, mitochondrial
Mitochondrial transcription factor 1
Mitochondrial transcription factor 2
Mitochondrial GTPase 1
Mitochondrial translation optimization protein 1
Myosin-4
Leucine--tRNA ligase, mitochondrial
37S ribosomal protein NAM9, mitochondrial
External NADH-ubiquinone oxidoreductase 1, mitochondrial
External NADH-ubiquinone oxidoreductase 2, mitochondrial
Rotenone-insensitive NADH-ubiquinone oxidoreductase, mitochondrial
Cysteine desulfurase, mitochondrial

NifU-like protein, mitochondrial
NGG1-interacting factor 3
Probable hydrolase NIT3
Mitochondrial 2-oxodicarboxylate carrier 1
Mitochondrial 2-oxodicarboxylate carrier 2
Mitochondrial outer membrane protein OM14
Mitochondrial outer membrane protein OM45
Mitochondrial metalloendopeptidase OMA1
Methyltransferase OMS1, mitochondrial
Mitochondrial ornithine transporter 1
Mitochondrial inner membrane protein OXA1
NADPH dehydrogenase 2
Phenylacrylic acid decarboxylase 1, mitochondrial
Presequence translocated-associated motor subunit PAM17, mitochondrial
Pyruvate dehydrogenase E1 component subunit alpha, mitochondrial
Pyruvate dehydrogenase E1 component subunit beta, mitochondrial
Pyruvate dehydrogenase complex protein X component, mitochondrial
Protein PET122, mitochondrial
37S ribosomal protein PET123, mitochondrial
Putative mitochondrial translation system component PET127
Protein PET130
Pentatricopeptide repeat-containing protein PET309, mitochondrial
Phosphatidylglycerol phospholipase C
Phosphatidylinositol 3-phosphate-binding protein 2
Mitochondrial phosphate carrier protein 2
Lon protease homolog, mitochondrial
[Pyruvate dehydrogenase (acetyl-transferring)] kinase 1, mitochondrial
[Pyruvate dehydrogenase (acetyl-transferring)] kinase 2, mitochondrial
DNA polymerase alpha catalytic subunit A
Mitochondrial outer membrane protein porin 1
NADH kinase POS5, mitochondrial
Inorganic pyrophosphatase, mitochondrial
Mitochondrial holo-[acyl-carrier-protein] synthase
Exopolyphosphatase
Saccharolysin
Mitochondrial peroxiredoxin PRX1
Phosphatidylserine decarboxylase proenzyme 1, mitochondrial;Phosphatidylserine decarboxylase 1 beta chain;Phosphatidylserine de
Protoplast secreted protein 2
Peptidyl-tRNA hydrolase
tRNA pseudouridine(27/28) synthase
21S rRNA pseudouridine(2819) synthase
tRNA pseudouridine(31) synthase
Delta-1-pyrroline-5-carboxylate dehydrogenase, mitochondrial
Pyruvate kinase 2
Uncharacterized mitochondrial protein RF1
Cytochrome b-c1 complex subunit 10
Cytochrome b-c1 complex subunit 2, mitochondrial
Cytochrome b-c1 complex subunit 6
Cytochrome b-c1 complex subunit 7
Cytochrome b-c1 complex subunit 8
UV excision repair protein RAD23
Respiratory supercomplex factor 2, mitochondrial
Thiosulfate sulfurtransferase RDL1, mitochondrial
Oligoribonuclease, mitochondrial
Single-stranded DNA-binding protein RIM1, mitochondrial
Cytochrome b-c1 complex subunit Rieske, mitochondrial

Protein RMD9, mitochondrial
54S ribosomal protein RML2, mitochondrial
Ribonuclease P protein component, mitochondrial
DNA-directed RNA polymerase, mitochondrial
Required for respiratory growth protein 1, mitochondrial
37S ribosomal protein S10, mitochondrial
37S ribosomal protein RSM18, mitochondrial
37S ribosomal protein S19, mitochondrial
37S ribosomal protein S22, mitochondrial
37S ribosomal protein S23, mitochondrial
37S ribosomal protein S24, mitochondrial
37S ribosomal protein S25, mitochondrial
37S ribosomal protein S26, mitochondrial
37S ribosomal protein RSM28, mitochondrial
37S ribosomal protein S7, mitochondrial
Retrograde regulation protein 2
Sorting assembly machinery 37 kDa subunit
Succinate dehydrogenase [ubiquinone] flavoprotein subunit, mitochondrial
Succinate dehydrogenase [ubiquinone] iron-sulfur subunit, mitochondrial
Succinate dehydrogenase [ubiquinone] cytochrome b small subunit, mitochondrial
Succinate/fumarate mitochondrial transporter
Serine hydroxymethyltransferase, mitochondrial
Mitochondrial tRNA-specific 2-thiouridylase 1
Sigma-like sequence protein 1, mitochondrial
Superoxide dismutase [Mn], mitochondrial
Protein SOV1, mitochondrial
Heat shock protein SSA2
Heat shock protein SSC1, mitochondrial
Heat shock protein SSQ1, mitochondrial
Protein STB1
Phosphatidylinositol 4-kinase STT4
ATP-dependent RNA helicase SUV3, mitochondrial
Mitochondrial chaperone TCM62
Glyceraldehyde-3-phosphate dehydrogenase 2
ATP synthase subunit e, mitochondrial
Mitochondrial import inner membrane translocase subunit TIM23
Mitochondrial import inner membrane translocase subunit TIM44
Mitochondrial import inner membrane translocase subunit TIM50
Mitochondrial import receptor subunit TOM20
Mitochondrial import receptor subunit TOM22
Mitochondrial import receptor subunit TOM40
Mitochondrial import receptor subunit TOM70
Trehalose-phosphatase
tRNA (guanine(26)-N(2))-dimethyltransferase, mitochondrial
Thioredoxin-3, mitochondrial
Elongation factor Tu, mitochondrial
Ribosomal protein VAR1, mitochondrial
Valine--tRNA ligase, mitochondrial
Putative mitochondrial carnitine O-acetyltransferase
Uncharacterized protein YBL095W, mitochondrial
Flavoprotein-like protein YCP4
Mitochondrial protein import protein MAS5
Putative carboxymethylenebutenolidase
Uncharacterized protein YER077C
Putative cysteine synthase
Putative pterin-4-alpha-carbinolamine dehydratase

Protein YIM1
Mitochondrial outer membrane protein YKR018C
Uncharacterized protein YKR023W
Uncharacterized protein YKR070W
LETM1 domain-containing protein YLH47, mitochondrial
Uncharacterized protein YLR290C, mitochondrial
Carrier protein YMC1, mitochondrial
Mitochondrial inner membrane i-AAA protease supercomplex subunit YME1
Mitochondrial escape protein 2
54S ribosomal protein YmL6, mitochondrial
37S ribosomal protein YMR-31, mitochondrial
Uncharacterized protein YNL208W
ABC1 family protein YPL109C, mitochondrial
Uncharacterized protein YPL168W
Uncharacterized mitochondrial carrier YPR011C
PX domain-containing protein YPR097W
GRAM domain-containing protein YSP2
Mitochondrial respiratory chain complexes assembly protein YTA12

E3 ubiquitin-protein ligase SNT2
Alanine/arginine aminopeptidase
Aspartate aminotransferase, cytoplasmic
Actin
Phosphoribosylaminoimidazole-succinocarboxamide synthase
Adenylosuccinate synthetase
Adenylosuccinate lyase
Phosphoribosylaminoimidazole carboxylase
C-1-tetrahydrofolate synthase, cytoplasmic;Methylenetetrahydrofolate dehydrogenase;Methenyltetrahydrofolate cyclohydrolase;Formyltetrahydrofolate dehydrogenase
Bifunctional purine biosynthetic protein ADE5,7;Phosphoribosylamine-glycine ligase;Phosphoribosylformylglycinamide cyclo-ligase
Alcohol dehydrogenase 1
Alcohol dehydrogenase 2
NADP-dependent alcohol dehydrogenase 6
Adenosine kinase
ATPase family gene 2 protein
Peroxisomal protein type-2
Putative COX1/OXI3 intron 1 protein
Putative COX1/OXI3 intron 2 protein
Protein AIM2
Altered inheritance of mitochondria protein 6
Actin-interacting protein 1
Protein AIR2
Aldehyde dehydrogenase [NAD(P)+] 1
Aldehyde dehydrogenase [NAD(P)+] 2
Magnesium-activated aldehyde dehydrogenase, cytosolic
Arrestin-related trafficking adapter 3
Mannan polymerase II complex ANP1 subunit
J domain-containing protein APJ1
AP-2 complex subunit beta
AP-3 complex subunit delta
AP-3 complex subunit beta
Adaptin medium chain homolog APM2
AP-3 complex subunit mu
AP-2 complex subunit mu
DNA-(apurinic or apyrimidinic site) lyase 1
Phosphatidate phosphatase APP1

AP-3 complex subunit sigma
D-arabinose dehydrogenase [NAD(P)+] heavy chain
ABC transporter ATP-binding protein ARB1
Actin-related protein 2/3 complex subunit 3
Actin-related protein 2/3 complex subunit 4
Actin-related protein 2/3 complex subunit 2
ADP-ribosylation factor 1
ADP-ribosylation factor 2
Argininosuccinate synthase
Argininosuccinate lyase
ADP-ribosylation factor-like protein 1
Transaminated amino acid decarboxylase
Chorismate synthase
Phospho-2-dehydro-3-deoxyheptonate aldolase, phenylalanine-inhibited
Phospho-2-dehydro-3-deoxyheptonate aldolase, tyrosine-inhibited
Aromatic/aminoadipate aminotransferase 1
Centractin
Actin-related protein 2
Actin-related protein 3
Actin-related protein 4
Actin-related protein 5
Actin-like protein ARP8
Asparagine synthetase [glutamine-hydrolyzing] 2
Autophagy-related protein 11
Autophagy-related protein 13
Autophagy-related protein 34
Ammonia transport outward protein 2
Late secretory pathway protein AVL9
Target of rapamycin complex 2 subunit AVO1
Target of rapamycin complex 2 subunit AVO2
Putative protease AXL1
Box C/D snoRNA protein 1
Protein BCH1
Protein BCP1
(R,R)-butanediol dehydrogenase
Bud emergence protein 1
Bud emergence protein 4
Glucan 1,3-beta-glucosidase
Intron-encoded RNA maturase bI4;Truncated, nonfunctional cytochrome b;RNA maturase bI4
Protein BIM1
Dethiobiotin synthetase
Probable target of rapamycin complex 2 subunit BIT2
Protein BMH2
Protein BNI1
Beige protein homolog 1
Bile pigment transporter 1
Mitotic check point protein BUB2
Inhibitory regulator protein BUD2/CLA2
Bud site selection protein 27
Bud site selection protein 3
Bud site selection protein 6
Cap-associated protein CAF20
Protein CAF40
Protein CAJ1
F-actin-capping protein subunit alpha
F-actin-capping protein subunit beta

Arginase
Ornithine aminotransferase
Regulatory protein CAT8
Cytochrome b termination protein 1
Protein CCC1
T-complex protein 1 subunit epsilon
T-complex protein 1 subunit eta
T-complex protein 1 subunit theta
Cell division control protein 10
Cell division control protein 11
Cell division control protein 15
Pyruvate kinase 1
Anaphase-promoting complex subunit CDC23
Cell division control protein 25
Cyclin-dependent kinase 1
Cell division control protein 31
Cell division control protein 53
Cell division control protein 7
Cytoplasmic export protein 1
Chitin synthase 2
Cytosolic iron-sulfur protein assembly protein 1
Probable electron transfer flavoprotein subunit beta
Choline kinase
Clustered mitochondria protein 1
Calmodulin 1
Calcium/calmodulin-dependent protein kinase I
Cofilin
Conserved oligomeric Golgi complex subunit 3
Conserved oligomeric Golgi complex subunit 5
Conserved oligomeric Golgi complex subunit 8
Protein CASP
Carbamoyl-phosphate synthase arginine-specific large chain
Peptidyl-prolyl cis-trans isomerase B
Exportin-1
Coronin-like protein
Importin alpha re-exporter
Phosphatidylinositol transfer protein CSR1
Catalase T
CUE domain-containing protein 3
Cytochrome b5
Adenylate cyclase
Cystathionine gamma-lyase
Dihydroxyacetone kinase 1
Cell cycle protein kinase DBF2
Lariat debranching enzyme
Delta(3,5)-Delta(2,4)-dienoyl-CoA isomerase
m7GpppX diphosphatase
Inactive diphosphatase DCS2
Mannan endo-1,6-alpha-mannosidase DCW1
DNA damage-inducible protein 1
Stress protein DDR48
DER1-like family member protein 1
2-deoxy-glucose resistant protein 2
Vacuolar protein-sorting-associated protein 46
DOA4-independent degradation protein 4
Down-regulator of invasive growth 2

Dynamin-related protein DNM1
Protein dopey
Peroxiredoxin DOT5
Sphingosine-1-phosphate lyase
Aspartate--tRNA ligase, cytoplasmic
Endo-1,3(4)-beta-glucanase 1
Urea amidolyase;Urea carboxylase;Allophanate hydrolase
Dynein heavy chain, cytoplasmic
Dynein light chain 1, cytoplasmic
Deoxyhypusine synthase
3,2-trans-enoyl-CoA isomerase
Putative metallocarboxypeptidase ECM14
UPF0045 protein ECM15
Protein ECM21
Protein ECM25
Protein ECM30
Protein ECM5
Enhancer of mRNA-decapping protein 3
Nascent polypeptide-associated complex subunit beta-1
Nascent polypeptide-associated complex subunit alpha
Elongation of fatty acids protein 2
Elongation of fatty acids protein 3
Elongator complex protein 3
Elongator complex protein 6
Putative glucokinase-2
Endosomal protein P24B
Protein EMP47
Epsin-2
Epsin-3
Epsin-5
ER-retained PMA1-suppressing protein 1
ER lumen protein-retaining receptor
Squalene monooxygenase
Mevalonate kinase
Hydroxymethylglutaryl-CoA synthase
C-8 sterol isomerase
Farnesyl pyrophosphate synthase
Sterol-4-alpha-carboxylate 3-dehydrogenase, decarboxylating
Ergosterol biosynthetic protein 28
Cytochrome P450 61
Phosphomevalonate kinase
Protein ERP4
FAD-linked sulfhydryl oxidase ERV2
Pre-rRNA-processing protein ESF2
Glucan 1,3-beta-glucosidase I/II
Exocyst complex component EXO84
Cyclin-dependent kinase inhibitor FAR1
Factor arrest protein 8
Fructose-1,6-bisphosphatase
rRNA-processing protein FCF1
rRNA-processing protein FCF2
Formate dehydrogenase 1
Peroxisomal hydratase-dehydrogenase-epimerase;2-enoyl-CoA hydratase;(3R)-3-hydroxyacyl-CoA dehydrogenase
Flippase kinase 1
FK506-binding protein 1
Putative Xaa-Pro aminopeptidase FRA1

Family of serine hydrolases 1
Protein FYV10
Glutamate decarboxylase
Galactokinase
Bifunctional protein GAL10;UDP-glucose 4-epimerase;Aldose 1-epimerase
Galactose transporter
Galactose-1-phosphate uridylyltransferase
SNF1 protein kinase subunit beta-3
Glycerol 2-dehydrogenase (NADP(+))
Glycerophosphodiester phosphodiesterase GDE1
NADP-specific glutamate dehydrogenase 1
Rab GDP-dissociation inhibitor
ATPase GET3
Golgi to ER traffic protein 4
Glutamine--fructose-6-phosphate aminotransferase [isomerizing]
Glucose-induced degradation protein 8
GLC7-interacting protein 2
Protein GIR2
Protein GIS4
1,4-alpha-glucan-branching enzyme
Glycogenin-1
Glucokinase-1
Lactoylglutathione lyase
Hydroxyacylglutathione hydrolase, cytoplasmic isozyme
Low specificity L-threonine aldolase
6-phosphogluconate dehydrogenase, decarboxylating 2
Golgi SNAP receptor complex member 1
Glycerol-3-phosphate dehydrogenase [NAD(+)] 1
Glycogen phosphorylase
Glycerol-3-phosphate O-acyltransferase 2
Monothiol glutaredoxin-3
Monothiol glutaredoxin-4
1,3-beta-glucan synthase component GSC2
Glucose-signaling factor 2
Glutathione transferase 3
Protein GVP36
Elongation factor 1 alpha-like protein
Protein HBT1
Elongation factor 3B
Delta-aminolevulinic acid dehydratase
HMG2-induced ER-remodeling protein 1
Protein HGH1
Protein HIR2
Histidine biosynthesis trifunctional protein;Phosphoribosyl-AMP cyclohydrolase;Phosphoribosyl-ATP pyrophosphohydrolase;Histidinase
Protein HMF1
High mobility group protein 1
Heme-binding protein HMX1
Hit family protein 1
Mitogen-activated protein kinase HOG1
Aspartate-semialdehyde dehydrogenase
Aspartokinase
Homoserine dehydrogenase
Protein HOS4
Protein HSH49
Cell wall mannoprotein HSP150
Heat shock protein 26

Glutathione-independent glyoxalase HSP31
Probable glutathione-independent glyoxalase HSP32
Heat shock protein 42
Probable E3 ubiquitin-protein ligase HUL5
Hexokinase-1
Hexokinase-2
Probable glucose transporter HXT5
High-affinity hexose transporter HXT6
High-affinity hexose transporter HXT6
Protein ICE2
Isocitrate lyase
Isopentenyl-diphosphate Delta-isomerase
Isocitrate dehydrogenase [NADP] cytoplasmic
Isocitrate dehydrogenase [NADP]
Ino eighty subunit 2
Protein IFH1
Elongator complex protein 5
Inosine-5-monophosphate dehydrogenase 3
Sugar utilization regulatory protein IMP2
Inositol monophosphatase 2
Inositol-3-phosphate synthase
Polyphosphatidylinositol phosphatase INP52;SAC1-like phosphoinositide phosphatase;Phosphatidylinositol 4,5-bisphosphate 5-phosphatase
Pre-rRNA-processing protein IPI1
Inorganic pyrophosphatase
Increased recombination centers protein 19
Increasing suppression factor 1
Protein IVY1
Intrastrand cross-link recognition protein
Carboxylic acid transporter protein homolog
Uncharacterized protein JIP4
Importin subunit beta-2
Importin beta-like protein KAP120
Importin beta-like protein KAP122
Importin subunit beta-1
Inositol hexakisphosphate kinase 1
Protein KES1
Dual specificity protein kinase KNS1
AP-1 accessory protein LAA1
Leukotriene A-4 hydrolase homolog
Sphingoid long chain base kinase 5
Heat shock protein 70 homolog LHS1
Exportin-T
LAS seventeen-binding protein 3
Protein LTV1
Protein LUC7
Saccharopine dehydrogenase [NAD(+), L-lysine-forming]
L-aminoadipate-semialdehyde dehydrogenase
Saccharopine dehydrogenase [NADP(+), L-glutamate-forming]
Methionine aminopeptidase 1
Methionine aminopeptidase 2
Metacaspase-1
Protein kinase MCK1
ABC1 family protein MCP2
Malate dehydrogenase, cytoplasmic
Malate dehydrogenase, peroxisomal
Midasin

Adenylyl-sulfate kinase
Protein MET17;O-acetylhomoserine sulfhydriylase;O-acetylserine sulfhydriylase
S-methyl-5-thioadenosine phosphorylase
MAP-homologous protein 1
Protein MKT1
Protein MLF3
Protein MLP2
Malate synthase 1, glyoxysomal
E3 ubiquitin-protein ligase linker protein MMS1
Mannan polymerase complexes subunit MNN9
Manganese resistance protein MNR2
DBF2 kinase activator protein MOB1
CBK1 kinase activator protein MOB2
Protein yippee-like MOH1
Protein MON2
Protein disulfide-isomerase MPD1
Methylthioribose-1-phosphate isomerase
Meiotic sister chromatid recombination protein 1
Putative aldehyde dehydrogenase-like protein YHR039C
DNA mismatch repair protein MSH6
Protein MSN5
Probable phosphatidylinositol 4-phosphate 5-kinase MSS4
Maintenance of telomere capping protein 1
Protein MUK1
Diphosphomevalonate decarboxylase
ATP-dependent helicase NAM7
Protein NAM8
NAP1-binding protein
NAP1-binding protein 2
[NU+] prion formation protein 1
Nonsense-mediated mRNA decay protein 2
Nonsense-mediated mRNA decay protein 5
Nitrogen network kinase 1
Transaldolase NQM1
Stress response protein NST1
Neutral trehalase
Oxysterol-binding protein homolog 2
Outer spore wall protein 5
OTU domain-containing protein 2
NADPH dehydrogenase 3
Protein PAM1
Protein PAR32
Protease B inhibitor 2
Protein PBN1
MAP kinase kinase PBS2
Probable tubulin--tyrosine ligase PBY1
Peroxisomal coenzyme A diphosphatase 1, peroxisomal
Phosphoenolpyruvate carboxykinase [ATP]
Peroxisomal-coenzyme A synthetase
Choline-phosphate cytidyltransferase
Protein PDC2
Probable 2-methylcitrate dehydratase
Phosphatidylinositol transfer protein PDR16
Saccharopepsin
E3 ubiquitin-protein ligase PEP5
Protein PET10

Peroxisomal ATPase PEX1
Peroxisomal biogenesis factor 3
Profilin
Phosphoglucomutase 2
Regulatory protein PHO2
Phosphate system positive regulatory protein PHO81
Cyclin-dependent protein kinase PHO85
Inorganic phosphate transporter PHO86
Low-affinity phosphate transporter PHO91
GSY2-interacting protein PIG2
[PSI+] inducibility protein 3
Phosducin-like protein 1
Plasma membrane ATPase 2
Calcium-transporting ATPase 2
Negative regulator of sporulation PMD1
Mannose-6-phosphate isomerase
Calcium-transporting ATPase 1
Nicotinamidase
3-ketoacyl-CoA thiolase, peroxisomal
Endopolyphosphatase
Cerevisin
Carboxypeptidase Y
Pre-mRNA-processing factor 19
Ribose-phosphate pyrophosphokinase 1
Ribose-phosphate pyrophosphokinase 2
Ribose-phosphate pyrophosphokinase 3
Ribose-phosphate pyrophosphokinase 5
Phosphatidylserine decarboxylase proenzyme 2;Phosphatidylserine decarboxylase 2 beta chain;Phosphatidylserine decarboxylase 2 a
Importin subunit beta-3
Protein PSP1
Protein PTI1
Pumilio homology domain family member 4
Periodic tryptophan protein 1
Peroxisomal long-chain fatty acid import protein 2
Peroxisomal long-chain fatty acid import protein 1
Glutamine-dependent NAD(+) synthetase
UDP-N-acetylglucosamine pyrophosphorylase
RNA 3-terminal phosphate cyclase-like protein
Regulator of the glycerol channel 1
Respiratory growth induced protein 1
GTP-binding protein RHO3
GTP-binding protein RHO5
Ribosome assembly protein 1
GTP cyclohydrolase-2
6,7-dimethyl-8-ribityllumazine synthase
Meiotic activator RIM4
pH-response regulator protein palF/RIM8
Pre-rRNA-processing protein RIX1
Ribose-5-phosphate isomerase
Sporulation protein RMD1
Sporulation protein RMD8
[PIN+] prion protein RNQ1
Protein ROD1
Ubiquitin carboxyl-terminal hydrolase RPN11
26S protease regulatory subunit 4 homolog
26S protease regulatory subunit 6B homolog

26S protease regulatory subunit 6A
26S protease regulatory subunit 8 homolog
Exosome complex component RRP4
Exosome complex component RRP45
Respiration factor 1
Restriction of telomere capping protein 1
Reticulon-like protein 2
Reduced viability upon starvation protein 161
Reduced viability upon starvation protein 167
Fimbrin
Adenosylhomocysteinase
S-adenosylmethionine synthase 1
S-adenosylmethionine synthase 2
Protein SAP1
SIT4-associating protein SAP155
Protein transport protein SBH2
DnaI-related protein SCJ1
Probable family 17 glucosidase SCW10
Probable family 17 glucosidase SCW4
Protein SDA1
Protein SDS23
Protein SDS24
SEH-associated protein 4
Exocyst complex component SEC10
Signal peptidase complex catalytic subunit SEC11
SEC14 cytosolic factor
Exocyst complex component SEC15
Alpha-soluble NSF attachment protein
Vesicular-fusion protein SEC18
Protein transport protein SEC24
Exocyst complex component SEC3
Ras-related protein SEC4
Exocyst complex component SEC5
Exocyst complex component SEC6
Protein transport protein SEC61
Translocation protein SEC62
Protein transport protein SEC7
Exocyst complex component SEC8
D-3-phosphoglycerate dehydrogenase 1
D-3-phosphoglycerate dehydrogenase 2
SET domain-containing protein 3
Protein SEY1
Protein SFI1
Suppressor of glycerol defect protein 1
SAGA-associated factor 29
SAGA-associated factor 73
Small glutamine-rich tetratricopeptide repeat-containing protein 2
Outer spore wall assembly protein SHE10
SWI5-dependent HO expression protein 2
SWI5-dependent HO expression protein 4
Seventh homolog of septin 1
SNF1 protein kinase subunit beta-1
Protein SIP3
Regulatory protein SIR4
Protein SKG3
Antiviral helicase SKI2

Antiviral protein SKI8
Protein SKT5
Protein SLA2
Protein SLF1
Antiviral helicase SLH1
Phosphatidylinositol 4,5-bisphosphate-binding protein SLM1
Phosphatidylinositol 4,5-bisphosphate-binding protein SLM2
Mitogen-activated protein kinase SLT2/MPK1
Protein SLY1
Cell wall assembly regulator SMI1
Protein SMY2
5-AMP-activated protein kinase subunit gamma
Sorting nexin-3
Sorting nexin-4
Sorting nexin-41
Probable pyridoxal 5-phosphate synthase subunit SNZ2; Probable pyridoxal 5-phosphate synthase subunit SNZ3
Protein SOK1
6-phosphogluconolactonase-like protein 2
Spermidine synthase
Sporulation-specific protein 73
Protein SPP41
Protein SPT2
Ribosome assembly protein SQT1
Lethal(2) giant larvae protein homolog SRO7
Heat shock protein SSA1
Heat shock protein SSA3
Heat shock protein SSA4
Heat shock protein SSB1
Heat shock protein SSB2
Heat shock protein homolog SSE2
Sec sixty-one protein homolog
MAP kinase kinase kinase SSK2
Protein SSO2
Protein STB3
Protein STB5
Protein STU2
Eukaryotic peptide chain release factor subunit 1
SWR1-complex protein 3
Oxysterol-binding protein homolog 1
Regulatory protein SWI6
Importin beta SMX1
Synchronized import protein 1
Cell division cycle protein CDT1
Transaldolase
Type 2A phosphatase-associated protein 42
T-complex protein 1 subunit alpha
Glyceraldehyde-3-phosphate dehydrogenase 1
Glyceraldehyde-3-phosphate dehydrogenase 3
Protein TEX1
Carboxypeptidase Y inhibitor
Sterol esterase TGL1
Lipase 4
THO complex subunit 2
Homoserine kinase
Threonine synthase
Threonine--tRNA ligase, cytoplasmic

Protein TMA108
Protein TOS1
Tropomyosin-1
Polyamine transporter 3
Alpha,alpha-trehalose-phosphate synthase [UDP-forming] 56 kDa subunit
Trehalose synthase complex regulatory subunit TPS3
Protein TRI1
Anthranilate synthase component 1
Multifunctional tryptophan biosynthesis protein;Anthranilate synthase component 2;Indole-3-glycerol phosphate synthase
Trafficking protein particle complex II-specific subunit 120
Trafficking protein particle complex subunit 31
Thioredoxin-1
Thioredoxin-2
Trehalose synthase complex regulatory subunit TSL1
Tubulin alpha-1 chain
Tubulin beta chain
Tubulin alpha-3 chain
Tubulin gamma chain
Twinfilin-1
Prephenate dehydrogenase [NADP(+)]
Tyrosine--tRNA ligase, cytoplasmic
S-adenosyl-L-methionine-dependent tRNA 4-demethylwyosine synthase
Ubiquitin-activating enzyme E1 1
Ubiquitin-conjugating enzyme E2 1
Ubiquitin-conjugating enzyme E2-16 kDa
Ubiquitin carboxyl-terminal hydrolase 1
Ubiquitin carboxyl-terminal hydrolase 11
Ubiquitin carboxyl-terminal hydrolase 13
Ubiquitin carboxyl-terminal hydrolase 2
Ubiquitin carboxyl-terminal hydrolase 3
Ubiquitin carboxyl-terminal hydrolase 6
Ubiquitin carboxyl-terminal hydrolase 7
Ubiquitin carboxyl-terminal hydrolase 8
E3 ubiquitin-protein ligase UBR1
UBX domain-containing protein 2
UBX domain-containing protein 3
UBX domain-containing protein 5
UBX domain-containing protein 7
E4 ubiquitin-protein ligase UFD2
Ubiquitin fusion degradation protein 4
Succinate-semialdehyde dehydrogenase [NADP(+)]
UTP--glucose-1-phosphate uridylyltransferase
Ubiquitin-like-specific protease 1
Nonsense-mediated mRNA decay protein 3
Dihydroorotate dehydrogenase (fumarate)
Orotidine 5-phosphate decarboxylase
U1 SNP1-associating protein 1
Vacuole morphology and inheritance protein 14
Mannan polymerase I complex VAN1 subunit
V-type proton ATPase subunit F
V-type proton ATPase subunit D
Growth regulation protein
Protein WHI4
Tryptophan--tRNA ligase, cytoplasmic
Uncharacterized protein YBL059W
YAP1-binding protein 1

YAP1-binding protein 2
Uncharacterized glycosyl hydrolase YBR056W
Uncharacterized protein YBR225W
Uncharacterized transporter YBR287W
Uncharacterized protein YCR016W
UPF0743 protein YCR087C-A
Uncharacterized protein YDL027C
Uncharacterized ABC transporter ATP-binding protein YDR061W
UPF0661 TPR repeat-containing protein YDR161W
Uncharacterized protein YDR239C
FAS1 domain-containing protein YDR262W
Uncharacterized protein YDR476C
Uncharacterized protein YDR514C
Putative 2-hydroxyacyl-CoA lyase
Uncharacterized protein YEL137C
UPF0160 protein YER156C
Uncharacterized protein YFL042C
Uncharacterized protein YGL082W
Uncharacterized protein YGR122W
Uncharacterized protein YGR130C
Uncharacterized GTP-binding protein YGR210C
Uncharacterized protein YGR237C
Citrate/oxoglutarate carrier protein
Putative proline-tRNA ligase YHR020W
Uncharacterized protein YHR033W
Uncharacterized protein YHR080C
Uncharacterized protein YHR097C
Uncharacterized protein YHR127W
Uncharacterized protein YHR182W
Putative zinc metalloproteinase YIL108W
Uncharacterized protein YIL161W
Prenylated Rab acceptor 1
Protein YIP5
Uncharacterized protein YJL147C
Cell wall protein YJL171C
MEMO1 family protein YJR008W
Uncharacterized protein YJR111C
Uncharacterized protein YKL023W
Putative uncharacterized hydrolase YKL033W-A
Uncharacterized protein YKL075C
Uncharacterized protein YKL077W
Probable intramembrane protease YKL100C
Synaptobrevin homolog YKT6
Obg-like ATPase homolog
Uncharacterized protein YLL007C
KH domain-containing protein YLL032C
Uncharacterized protein YLR072W
Uncharacterized protein YLR179C
Putative 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase YLR345W;6-phosphofructo-2-kinase;Fructose-2,6-bisphosphatase
Probable ADP-ribose 1-phosphate phosphatase YML087W
Uncharacterized protein YML119W
Uncharacterized protein YMR160W
Uncharacterized protein YMR196W
Uncharacterized protein YMR265C
Uncharacterized protein YMR315W
Uncharacterized phosphatase YNL010W

Uncharacterized protein YNL050C
Uncharacterized protein YNL134C
Uncharacterized protein YNR034W-A
Uncharacterized protein YNR040W
Uncharacterized WD repeat-containing protein YOL087C
Protein YOP1
Uncharacterized protein YOR093C
Putative uncharacterized hydrolase YOR131C
Protein OS-9 homolog
Phosphorelay intermediate protein YPD1
AGC kinase YPK3
Uncharacterized protein YPL034W
Uncharacterized protein YPL067C
Putative aryl-alcohol dehydrogenase YPL088W
Uncharacterized protein YPL191C
Protein PBDC1 homolog
UPF0662 protein YPL260W
Uncharacterized protein YPR084W
Dilute domain-containing protein YPR089W
Uncharacterized PH domain-containing protein YPR091C
Uncharacterized protein YPR148C
GTP-binding protein YPT1
GTP-binding protein YPT32/YPT11;GTP-binding protein YPT31/YPT8
PX domain-containing protein YPT35
GTP-binding protein YPT52
GTP-binding protein YPT7
RNA annealing protein YRA2
ADP-ribose pyrophosphatase
Protein YSC84
Probable 26S protease subunit YTA6
Protein ZPS1
Glucose-6-phosphate 1-dehydrogenase
Arginine--tRNA ligase, cytoplasmic
Cysteine--tRNA ligase
Glucose-6-phosphate 1-epimerase
NAD(P)H-hydrate epimerase
S-formylglutathione hydrolase

Supplementary Table S4. Fold-change expression values for DEG in both DM and PS yeast are indicated.

Gene Standard Name	PS	DM	Gene Systematic Name	Annotation
GRE1	2.4	4.9	YPL223C	Genes de Respuesta a Estres 1 (spanish for stress responsive genes)
AGP1		4.6	YCL025C	Glutamine permease
SIP18	1.6	4.5	YMR175W	Salt Induced Protein 18; paralog to GRE1
GEX1	2.8	4.2	YCL073C	Glutathione EXchanger
SIT1		3.5	YEL065W	Siderophore Iron Transport 1
RPL18B		3.4	YNL301C	Ribosomal 60S subunit protein L18B
FIT2		3.3	YOR382W	Facilitator of Iron Transport
ENO2	1.7	3.3	YHR174W	Enolase 2
STL1		3.2	YDR536W	Glycerol proton symporter; plasma membrane
THI4		3.2	YGR144W	Thiazole synthase; thiamine biosynthesis
DIT2		3.2	YDR402C	DITyrosine 2
CUP1-2	1.9	3.0	YHR055C	Metallothionein CUP1-2
FET3	-1.8	3.0	YMR058W	Ferrous Transport 3; ferroxidase
CUP1-1	1.9	3.0	YHR053C	Metallothionein CUP1-1
FOX2	-2.5	-3.0	YKR009C	Hydroxyacyl-CoA dehydrogenase/enoyl-CoA hydratase (bifunctional)
FDH2	-1.8	-3.1	YPL275W	Formate DeHydrogenase 2; pseudogene
CYC7	-1.6	-3.2	YEL039C	Cytochrome C 7
ADH2	-2.9	-3.2	YMR303C	Alcohol DeHydrogenase 2
YHI9	-1.9	-3.2	YHR029C	Protein of unknown function
AAD4		-3.2	YDL243C	Aryl-Alcohol Dehydrogenase 4
MIG2	-2.2	-3.3	YGL209W	Multicopy Inhibitor of GAL gene expression 2
OPT2		-3.3	YPR194C	OligoPeptide Transporter 2
SCW11	1.7	-3.3	YGL028C	Soluble Cell Wall protein 11; glucan endo-1,3-beta-D-glucosidase
HSP30		-3.3	YCR021C	Heat Shock Protein 30
FDH1	-4.4	-3.5	YOR388C	Formate DeHydrogenase 1
PXA1		-3.6	YPL147W	PeroXisomal ABC-transporter 1
HXT3	-5.7	-3.6	YDR345C	Hexose Transporter 3
BDH1	-2.0	-3.6	YAL060W	Butanediol DeHydrogenase 1
GAL2		-3.7	YLR081W	GALactose metabolism 2
YCT1		-3.8	YLL055W	Yeast Cysteine Transporter 1
ASP3-2	-1.7	-3.8	YLR157C	ASParaginase 3-2
ASP3-4	-1.7	-3.9	YLR160C	ASParaginase 3-4
ASP3-1	-1.7	-3.9	YLR155C	ASParaginase 3-1
ASP3-3	-1.7	-3.9	YLR158C	ASParaginase 3-3
DAL4	-5.0	-4.5	YIRO28W	Degradation of Allantoin 4; allantoin permease
BDH2		-5.3	YAL061W	Medium-chain alcohol dehydrogenase with similarity to BDH1
DAL5	-3.3	-8.5	YJR152W	Degradation of Allantoin 5; allantoate permease
OPT1	-1.7	-9.3	YJL212C	OligoPeptide Transporter 1

Supplementary Table S5. qRT-PCR verification of RNA-seq expression values for five selected DE genes in PS- and DM-expressing yeast. qRT-PCR expression values are determined by comparing expression levels to empty vector (EV) yeast line, which is set to “1” for each gene tested. NDE indicates not differentially expressed (≤ 1.5 -fold) in RNA-seq and qRT data for that gene. PCR primers used for each gene are indicated in Supplementary Table S1. Student’s t-test analysis shows * $p \leq 0.05$, ** $p \leq 0.01$.

SGD ID	Symbol	Annotation	Fold-Change Expression			
			RNA-seq		qRT-PCR	
			PS	DM	PS	DM
Intracellular P storage and remobilization						
S000005940	VTC3	polyphosphate synthesis, regulatory subunit of the vacuolar transporter chaperone (VTC) complex	2.1	NDE	1.99**	NDE
Intracellular Recycling of P						
S000006031	GDE1	Phosphodiesterase; product serves as a phosphate source	1.5	NDE	3.3*	NDE
Pi Transporters						
S000000695	GIT1	Glycerolphosphoinositol 1; PM permease; substrates as sources of inositol and phosphate; Pi uptake	5.8	2.2	4.38	4.61
Nitrogen transport and metabolism						
S000003913	DAL5	Degradation of Allantoin 4; allantoin permease	-3.3	-8.5	-2.04*	-3.44*
S000004145	ASP3-1	ASParaginase 3-1	-1.7	-3.9	-1.96*	-2.3**
S000005909	FIT2	Facilitator of iron transport	NDE	3.3	NDE	2.18
S000000530	AGP1	Glutamine permease	NDE	4.6	NDE	1.83*

Supplementary Table S6. Differential expression of genes that function in phosphate homeostasis in yeast PS and DM lines. Genes with PS-specific binding sites in their promoters are indicated and gene models for binding sites and their potential target genes are shown in **Figure x**. Grey-shaded genes are Pho4p-regulated in WT yeast (Zhou and Shea 2011, <https://doi.org/10.1016/j.molcel.2011.05.025> ; SGD annotation). InsPPs bind SPX domains (*) of proteins in the INPHORS (intracellular phosphate reception and signaling) pathway that regulate Pi homeostasis, in coordination with transcriptional regulation of *PHO* regulon genes; Austin and Mayer 2020).

Standard Name	SPX-Domain Protein*	Function	Expression FC		PS-Specific Binding Site
			PS	DM	
Extracellular Foraging for P					
PHO3		Acid phosphatase PHO3, constitutive, secreted	2.9		
PHO5		Repressible acid phosphatase, secreted			
PHO11		Repressible acid phosphatase, secreted	1.8		X
PHO12		Repressible acid phosphatase, secreted	2.5	1.5	X
Pi Transporters					
ERD1		regulates ER luminal protein retention; Pi export from Golgi to cytosol	1.6		X
GIT1		Glycerolphosphoinositol 1; PM permease; substrates are sources of inositol and phosphate; Pi uptake	5.8	2.2	
PHO84		High affinity Pi transporter (expressed in <i>pho84</i> mutant but non-functional)	3.4		
PHO87	X	Low-affinity inorganic phosphate (Pi) transporter; ; not regulated in response to Pi limitation			
PHO89		Plasma membrane Na+/Pi cotransporter; high-affinity Pi uptake	1.8		
PHO90	X	Low-affinity inorganic phosphate (Pi) transporter; ; not transcriptionally regulated in response to Pi limitation	-2.4	-2.1	
PHO91	X	Low-affinity vacuolar inorganic phosphate (Pi) exporter; not transcriptionally regulated in response to Pi limitation			
SYG1	X	Suppressor of Yeast GPA1; putative Pi exporter; PM		-1.5	
Intracellular Recycling of P					
GDE1	X	Phosphodiesterase; product serves as a phosphate source	1.5		X
GPP2		Glycerol-3-Phosphate phosphatase			
PHM8		Lysophosphatidic acid phosphatase, nucleotidase; response to phosphate starvation		1.5	
Intracellular Storage, Remobilization of P					
PHO8		Repressible vacuolar alkaline phosphatase; controls polyphosphate content; regulated by levels of Pi			
PPN1		Dual endo- and exopolyphosphatase; not regulated by Pi levels			
PPN2		Repressible vacuolar alkaline phosphatase; polyphosphate metabolism; Zn2+-dependent endopolyphosphatase	1.6		X
VTC1		polyphosphate synthesis, regulatory subunit of the vacuolar transporter chaperone (VTC) complex			
VTC2	X	polyphosphate synthesis, regulatory subunit of the vacuolar transporter chaperone (VTC) complex			
VTC3	X	polyphosphate synthesis, regulatory subunit of the vacuolar transporter chaperone (VTC) complex	2.1		
VTC4	X	polyphosphate synthesis, subunit of the vacuolar transporter chaperone (VTC) complex	1.5	-1.5	
VTC5	X	polyphosphate synthesis, regulatory subunit of the vacuolar transporter chaperone (VTC) complex			
Regulatory					
CBF1		Centromere binding factor 1; competes for Pho4 binding site motif CACGTG		-1.7	
PHO2		Transcription factor PHO2; constitutively expressed	2.2		X
PHO4		Transcription factor PHO4; constitutively expressed	1.7		
PHO81	X	Cyclin-dependent kinase (CDK) inhibitor; facilitates Pho4 translocation into the nucleus	1.6		
PHO85		Cyclin-dependent kinase (CDK)	1.7		X
PHO86		ER protein, regulates Pho84 trafficking to PM		-1.7	
PHO92		Post-transcriptional regulation of Pho4 via Pi-dependent degradation of Pho4 mRNA			
SPL2		Suppressor of Plc1 deletion, regulatory protein	2.4		X
Miscellaneous Phosphate Starvation Responsive					
ENA1		P-type ATPase sodium pump; Na+ / Li+ efflux, salt tolerance	1.7		
PHM6		Protein of unknown function	3.3	-1.7	X
PHM7		Protein of unknown function		-1.8	X
Inositol Metabolism**					
Inositol Synthesis, Cellular Uptake of Inositol					
INO1		Inositol-3-phosphate synthase	5.0	2.4	
ITR1		myo-Inositol transporter	1.8	2.2	
InsP Synthesis					
PLC1		Phospholipase C1; synthesis of inositol 1,4,5-triphosphate precursor of InsPPs	1.8		X
Regulation of Inositol Metabolism					
INO2			2.5		
InsPP Synthesis					
IPK1		Inositol Polyphosphate Kinase 1; phytate synthesis	2.1		X
IPMK		Inositol polyphosphate multikinase (IPMK), arginine-requiring; InsP5 synthesis			
KCS1		InsP6 and InsP7 kinase; important for phosphate signaling	1.5		
VIP1		Bifunctional inositol pyrophosphate kinase and phosphatase; important for phosphate signaling			
InsPP Catabolism					
DDP1		Diadenosine and diphosphoinositol polyphosphate phosphatase; InsP7 hydrolysis			
SIW14		Synthetic Interaction with Whi2; hydrolyzes the 8-phosphate of 5-InsP7			

Supplementary Table S7. Some differentially-expressed genes in day 7 Arabidopsis *PS* and *DM* seedlings.

Gene	FC Expression		Symbol	Annotation
	PS	DM		
AT5G05060	41.9	27.1	MUG13.8	Cystatin/monellin superfamily protein; thiol proteinase inhibitors
AT1G75945	1.7	9.4		Uncharacterized protein
AT4G15670		2.4	GRXS7	Monothiol glutaredoxin-S7
AT1G08630		2.3	THA1	Threonine aldolase 1
AT2G19800		2.2	MIOX2	<i>myo</i> -inositol oxygenase 2; syncytium formation
AT1G52770		2.1		Phototropic-responsive NPH3 family protein
AT1G75750	1.7	2.1	GASA1	Gibberellin-regulated protein 1
AT2G47270	2.0	2.1	UPB1	Transcription factor UPBEAT1; regulation of ROS, root development
AT3G57520		2.1	RFS2	Galactinol-sucrose galactosyltransferase 2
AT4G15680		2.1	GRXS4	Monothiol glutaredoxin-S4
AT3G30775		2.1	POX1	Proline dehydrogenase 1 ; EARLY RESPONSIVE TO DEHYDRATION 5, ERD5
AT1G54020		2.0		GDSL esterase/lipase
AT3G16770	2.0	2.0	RAP2-3	Ethylene-responsive transcription factor ; resistance to H2O2 and heat stresses
AT3G48520		2.0	CYP94B3	Cytochrome P450 CYP94B3; attenuates the jasmonic acid signaling
AT1G07050	1.8	2.0		CCT motif family protein
AT4G21650	-1.6	-2.0	SBT3.13	Subtilisin-like protease SBT3.13
AT4G15393	-1.8	-2.0	CYP702A5	Cytochrome P450
AT4G12735	1.6	-2.0		Unknown protein
AT1G73010	-2.0	-2.0	PS2	phosphate starvation-induced gene 2; Inorganic pyrophosphatase 1
AT2G04070		-2.1	DTX4	DETOXIFICATION 4
AT1G29395		-2.2	COR413IM1	COLD REGULATED 413 INNER MEMBRANE 1
AT5G50950		-2.2	FUM2	FUMARASE 2
AT3G51895		-2.3	SULTR3;1	Sulfate transporter 3.1
AT1G05680		-2.3	UGT74E2	UDP-glycosyltransferase 74E2; ROS and auxin signaling
AT5G13170	1.5	-2.5	SWEET15	Bidirectional sugar transporter; senescence-associated gene 29
AT2G18193		-2.8		AAA-ATPase
AT1G77220		-3.2		Protein of unknown function (DUF300); LAZ1 homolog 1
AT2G04050	-1.9	-4.1	DTX3	DETOXIFICATION 3

Supplementary Table S8. qRT-PCR verification of RNA-seq expression values for five selected DE genes in PS2- and DM4-expressing Arabidopsis. qRT-PCR expression values are determined by comparing expression levels to WT lines which is set to 1 for each gene tested. NDE indicates not-differentially-expressed (< 1.5-fold) in RNA-seq and qRT data for that gene. Student's t-test analysis shows *p<0.05, **p<0.01.

ATG ID	Symbol	Annotation	Fold-Change Expression			
			RNA-seq		qRT-PCR	
			PS	DM	PS	DM
At2g33770	PHO2	Phosphate 2, Ubiquitin-conjugating enzyme 24	NDE	-1.6	NDE	-2.63**
At2g04050	DTX3	Detoxification 3, Mate efflux family protein	-1.9	-4.1	-1.85*	-1.72**
At2g47270	UPB1	UPBEAT 1 transcription factor	2	2.1	5.31*	1.8
At1g05680	UGT74E2	Uridine diphosphate glycosyltransferase	NDE	-2.3	NDE	-1.85*
At1g75945	Unknown	Hypothetical protein	1.7	9.4	9.8**	55.4*

Supplementary Table S9. Differentially-expressed phosphate starvation-responsive genes in *PS* and *DM* plants. Fold-change (FC) expression values are given for each plant, relative to WT control plants.

Gene	PS	DM	Symbol	Description
AT4G02270	1.7		RHS13	Root hair specific 13
AT5G58010	1.6		LRL3	Lotus japonicus ROTHAIRLESS1 (LjRHL1)-like 3
AT5G47740	1.5		AT5G47740	Adenine nucleotide alpha hydrolases-like superfamily protein
AT1G76430	-1.5		PHT1;9	Phosphate transporter 1;9
AT1G20620	-1.5		CAT3	Catalase-3
AT5G43370	-1.6		PHT1;2	Phosphate transporter 1;2
AT1G73010	-2.0	-2.0	PPA1	Inorganic pyrophosphatase 1
AT5G20410		-1.8	MGD2	Monogalactosyldiacylglycerol synthase 2; chloroplastic
AT2G22240		-1.7	IPS2	Inositol-3-phosphate synthase isozyme 2
AT2G33770		-1.6	PHO2, UBC24	Phosphate 2; ubiquitin-conjugating enzyme E2 24
AT3G23430		-1.5	PHO1	Phosphate transporter PHO1
AT1G14700		-1.5	PAP3	Purple acid phosphatase 3
AT1G13300		1.6	HRS1	HYPERSENSITIVITY TO LOW PI-ELICITED PRIMARY ROOT SHORTENING 1
AT3G20520		1.7	GDPDL5	Glycerophosphodiester phosphodiesterase-like 5
AT5G41080		1.8	GDPD2	Glycerophosphodiester phosphodiesterase 2

Supplementary Table S10. Summary information about PS and DM binding sites integrated with PS- and DM-specific gene expression in yeast. Nearest upstream and downstream genes from each binding site are identified. Upstream "sense" or downstream "antisense" gene orientations are not have the PS or DM binding site in their promoter, so corresponding gene expression values are assumed to be unrelated to PS or DM binding the site. A 5' - 3' distance = "0" indicates partial or complete binding site overlap with the gene.

Peak ID	Chromosome	Region	Center of peak	Length (bp)	Peak height	Position	Gene	r distance	5' gene orientation	5' gene	r distance	3' gene orientation	FC Expression	PS	DM	Annotation	FC Expression	PS	DM	Annotation
PS-Specific ChIP-seq Binding Site and PS-Specific Expression (Y Genes)																				
18100_181513.X	X	18100_181513	181470	200	2.00	1.02	YRNA3	288	antisense	YRNA3	0	antisense	2.7	1.0	1.0	YRNA3 specific Antisense RNA	2.7	1.0	1.0	YRNA3 specific Antisense RNA
17061_17024.X	X	17061_17024	17024	200	2.41	1.01	YRNA1	102	antisense	YRNA1	0	antisense	2.0	1.0	1.0	YRNA1 specific Antisense RNA	2.0	1.0	1.0	YRNA1 specific Antisense RNA
10542_10580.X	X	10542_10580	10569	140	1.52	0.83	BAP1	155	antisense	BAP1	142	antisense	2.4	1.0	1.0	Branch-point Antisense RNA	2.4	1.0	1.0	Branch-point Antisense RNA
62877_62926.X	Y	62877_62926	62914	200	1.11	0.10	LSP1	14	antisense	LSP1	0	antisense	2.4	1.0	1.0	LSP1 specific Antisense RNA	2.4	1.0	1.0	LSP1 specific Antisense RNA
94906_94979.X	Y	94906_94979	94973	200	1.86	1.01	YRNA2	102	antisense	YRNA2	0	antisense	2.4	1.0	1.0	YRNA2 specific Antisense RNA	2.4	1.0	1.0	YRNA2 specific Antisense RNA
79726_79724.X	Y	79726_79724	79728	200	2.08	0.10	LSP1	155	antisense	LSP1	0	antisense	2.1	1.0	1.0	Suppression of Protein Translocation	2.1	1.0	1.0	Suppression of Protein Translocation
14344_14344.X	Y	14344_14344	14344	200	1.00	0.00	YRNA3	102	antisense	YRNA3	0	antisense	2.4	1.0	1.0	YRNA3 specific Antisense RNA	2.4	1.0	1.0	YRNA3 specific Antisense RNA
81891_81890.X	Y	81891_81890	81878	170	1.20	0.00	KMS1	703	antisense	YRNA3	0	antisense	2.0	1.0	1.0	Karyosome	2.0	1.0	1.0	Karyosome
71854_71845.X	Y	71854_71845	71843	132	2.62	0.10	YRNA1	102	antisense	YRNA1	0	antisense	2.0	1.0	1.0	Vegetative interaction with YRNA1	2.0	1.0	1.0	Vegetative interaction with YRNA1
18118_18120.X	Y	18118_18120	18120	150	1.01	0.00	YRNA1	102	antisense	YRNA1	0	antisense	2.0	1.0	1.0	Branch-point Antisense RNA	2.0	1.0	1.0	Branch-point Antisense RNA
62908_62726.X	Y	62908_62726	62715	240	2.01	0.02	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
49580_49714.X	Y	49580_49714	49714	200	2.51	0.01	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
24506_24499.X	Y	24506_24499	24499	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
24206_24254.X	Y	24206_24254	24230	100	2.10	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
24254_24254.X	Y	24254_24254	24254	200	1.96	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
32008_32553.X	Y	32008_32553	32008	140	1.81	0.01	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
60296_60293.X	Y	60296_60293	60292	132	1.81	0.01	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
90301_90490.X	Y	90301_90490	90390	200	1.99	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
90301_90490.X	Y	90301_90490	90390	200	1.99	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
12480_12479.X	Y	12480_12479	12479	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
12479_12480.X	Y	12479_12480	12479	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
42108_42108.X	Y	42108_42108	42108	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
1172618_1172618.X	Y	1172618_1172618	1172618	200	1.98	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
55484_55484.X	Y	55484_55484	55484	132	2.21	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
22408_22408.X	Y	22408_22408	22408	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
60326_60326.X	Y	60326_60326	60326	140	2.07	0.02	LTP1	789	antisense	LTP1	0	antisense	1.7	1.0	1.0	Low molecular weight protein Tyrosine Phosphatase	1.7	1.0	1.0	Low molecular weight protein Tyrosine Phosphatase
14314_14314.X	Y	14314_14314	14314	200	1.97	0.00	YRNA1	102	antisense	YRNA1	0	antisense	1.8	1.0	1.0	YRNA1 specific Antisense RNA	1.8	1.0	1.0	YRNA1 specific Antisense RNA
105518_105518.X	Y	105518_105518	105518	200	1.94	0.04	H2A	100	antisense	H2A	0	antisense	1.7	1.0	1.0	Histone H2A	1.7	1.0	1.0	Histone H2A
112672_112672.X	Y	112672_112672	112672	200	2.02	0.01	SPY1	251	antisense	SPY1	0	antisense	1.7	1.0	1.0	Suppression of Protein Translocation	1.7	1.0	1.0	Suppression of Protein Translocation
112672_112672.X	Y	112672_112672	112672	200	2.02	0.01	SPY1	251	antisense	SPY1	0	antisense	1.7	1.0	1.0	Suppression of Protein Translocation	1.7	1.0	1.0	Suppression of Protein Translocation
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7	1.0	1.0	Karyosome	1.7	1.0	1.0	Karyosome
1072818_1072818.X	Y	1072818_1072818	1072818	200	1.97	0.00	KMS1	703	antisense	KMS1	0	antisense	1.7							

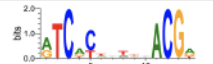
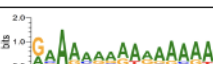
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569393_566175.XI	xi	568939_566175	566,026	237	2.91	0.00	PRM17	46	antisense	CCP1	0	antisense		Proteasome Translocase-Associated Motor	-2.5	Cytochrome c Peroxidase
471038_471248.XII	xii	471038_471248	471,146	111	3.83	0.00	OR20	6	antisense	SAB1	17	antisense		Endoplasmic reticulum chaperone	-2.6	GalT2-binding ATP-ADP antiporter
489247_489374.XI	xi	489247_489374	489,660	245	2.39	0.00	YMR109W.A	664	antisense	S4H4	64	antisense		Nucleus open reading frame	-2.6	Unknown mitochondrial DNA recombination
588319_588542.XII	xii	588319_588542	588,442	224	1.85	0.03	YMR12	136	antisense	YMR155W	18	antisense		Catalase-like cyclase peroxidase	-2.6	Putative protein of unknown function
630839_634050.XI	xi	630839_634050	632,933	112	2.36	0.00	YJAS39W.A	120	antisense	OR68	51	antisense	-1.5	Glutathione disulfide reductase	-2.6	
70723_70867.X	x	70723_70867	70,859	145	2.50	0.00	OR26	0	antisense	YJ193W	368	antisense	-2.7	Cell Division Cycle	-2.6	Putative protein of unknown function
375081_375152.XI	xi	375081_375152	375,136	153	1.77	0.04	YMR15	158	antisense	OR61	238	antisense		ORF component of U2 snRNP	-2.6	Oncoap Suppressor of Rho1
533005_533159.XI	x	533005_533159	533,124	164	3.12	0.00	OR29	64	antisense	YMR1	201	antisense		Carbamate Phosphatase Substrate A	-2.6	phosphatidylethanolamine 3-phosphatase YMR1
273718_273725.XI	x	273718_273725	273,639	148	1.99	0.02	OR16	0	antisense	FCY21	841	antisense		Pho81 Cyclin 6	-2.6	serine glutamine aminase
701736_702115.XI	x	701736_702115	701,076	386	1.89	0.00	YJY053C.A	731	antisense	OR29	0	antisense		Putative protein of unknown function	-2.6	Putative regulatory subunit of protein phosphatase G1Cp
372946_373153.XI	x	372946_373153	373,649	208	1.76	0.04	OR1E1	72	antisense	OR1	0	antisense		Binding partner of Tor2p	-2.6	protein kinase R51
328572_328640.XI	x	328572_328640	328,715	170	2.12	0.00	OR1E1	287	antisense	OR1	0	antisense		Binding partner of Tor2p	-2.6	protein kinase R51
792521_792610.XI	i	792521_792610	792,369	200	2.70	0.00	S3L3	436	antisense	PY41	398	antisense	-2.4	High affinity sulfate permease	-2.6	Catalase transcribing 2-type ATPase
246072_246223.XI	x	246072_246223	246,162	151	2.01	0.00	PMR5	0	antisense	MRP149	266	antisense		Essential 3-hydroxyacyl-CoA dehydrogenase of the ER membrane, Subunit of Nucleoside Synthase 1	-2.7	Mitochondrial Ribosomal Protein, Large subunit
540101_540446.XII	xii	540101_540446	540,198	346	3.97	0.00	YMR109W.A	0	antisense	OR12	710	antisense		Unknown open reading frame	-2.7	Protein containing GalT family zinc finger motifs, similar to Glc3p and Glc3p
577885_579146.XI	x	577885_579146	579,085	267	2.00	0.00	YJY0	271	antisense	MR15	0	antisense		Two-fold interacting protein, chromatin remodeling	-2.7	Mitochondrial respiratory complex subunit
330545_330684.XV	xv	330545_330684	330,620	136	1.88	0.03	ALG6	0	antisense	YMR9	770	antisense		ER luminal alpha 1,3-glucosyltransferase	-2.7	Yeast Galactose-4-epimerase (GAL4)
81326_81355.XI	x	81326_81355	81,325	130	1.76	0.04	ATG18A	140	antisense	OR67	62	antisense	-1.3	Autophagy-related	-2.7	chromatin DNA-binding H2A/H2B complex subunit GOM71/DBP1/DBP2
94481_94474.XI	i	94481_94474	94,563	142	2.01	0.02	PRY2	0	antisense	SAN1	12	antisense	-2.8	Functionally Related to YCP1	-2.7	ORF-binding protein S4P1
126310_126353.XI	i	126310_126353	126,293	247	1.76	0.04	SPOT	0	antisense	YJY14	360	antisense	-1.5	Nem-1/Spot phosphatase regulatory subunit SPOT	-2.7	Integral mitochondrial outer membrane (IMOM) protein
475349_475533.XII	xii	475349_475533	475,427	270	2.53	0.00	YMR129C	84	antisense	YMR2	0	antisense	-2.8	Putative protein of unknown function	-2.8	putative protein kinase YMR2
317007_317208.XI	x	317007_317208	317,069	202	1.80	0.04	OR24	26	antisense	LAC21	75	antisense		Cytochrome Oxidase Assembly	-2.8	Mitochondrial cytochrome c oxidase
349595_349730.XI	x	349595_349730	349,557	136	2.04	0.00	MRP	0	antisense	YMR51	254	antisense		phosphatase-like protein subunit beta 2	-2.8	Membrane-associated phosphatase
356468_357057.XI	x	356468_357057	356,580	190	5.05	0.00	YJY053C	15	antisense	PEY130	297	antisense		Threonine	-2.8	PEY130 subunit
397381_397561.XI	x	397381_397561	397,476	181	1.94	0.03	GGG021	584	antisense	PEY130	0	antisense		Threonine	-2.8	PEY130 subunit
238877_239015.XI	x	238877_239015	238,941	143	2.21	0.00	OR6	0	antisense	OR66	364	antisense	-1.8	5-phosphatidylethanolamine 4-kinase S66	-2.8	Cytochrome c oxidase
533930_533976.XI	x	533930_533976	533,421	127	4.69	0.00	VP50	564	antisense	S5C1	161	antisense		Vacuolar Protein Sorting	-2.8	Hsp70 family ATPase S5C1
100560_100710.XV	xv	100560_100710	100,635	142	2.14	0.02	SLA2	0	antisense	ATG2	627	antisense		Adaptor protein that links actin to clathrin and endoplasmic	-2.8	Residual membrane protein required for autophagic vesicle formation
382447_382616.XI	x	382447_382616	382,534	170	2.16	0.00	OR49	201	antisense	ATP4	0	antisense		Subunit of the Naal acetylcholinesterase complex	-2.8	Assembly Compensating Factor
636362_636591.XI	x	636362_636591	636,448	230	2.19	0.02	ENR1	403	antisense	VP50	0	antisense		Eggsin N-Terminal homology	-2.8	Vacuolar Protein Sorting 70
328888_329004.XI	x	328888_329004	328,944	116	1.89	0.00	YJY053C	0	antisense	PR1	616	antisense		Putative protein of unknown function	-2.8	Mitochondrial membrane phospholipase P1B1
691950_692117.XI	x	691950_692117	692,036	158	2.17	0.00	ATP2	17	antisense	OR67	458	antisense	-1.6	Basic subunit of the F1 sector of mitochondrial F1F0 ATP synthase	-2.8	Non-catalytic subunit of the F1F0 ATP synthase
128918_129054.XII	xii	128918_129054	128,988	137	1.87	0.03	MDX1	0	antisense	SDS1	818	antisense		Mdx1 Disease Suppressor, Putative component of the TOR regulatory pathway	-2.8	D serine aminomethylase SDX1
228710_229054.XI	x	228710_229054	228,804	145	2.86	0.00	OR127	220	antisense	CSM1	0	antisense		Constitutive	-2.8	Glucose Oxidase Mediator
105996_106116.XI	i	105996_106116	106,072	141	3.22	0.00	LTG1	123	antisense	PRY2	65	antisense	-1.8	Low Temperature Essential	-2.8	Protein G-Mitochondrial Translocase
331803_331873.XI	x	331803_331873	331,613	265	1.80	0.04	YJY053W	0	antisense	TM54	101	antisense	-2.7	Ubiquitin-like protein, mediating resistance to S-FU	-2.8	Translocase of the inner mitochondrial membrane
486628_486804.XI	x	486628_486804	486,698	177	2.60	0.00	PRY2	451	antisense	CSM1	0	antisense		Protein-binding domain homology	-2.8	Quinone reductase Exchange on ADP
62918_63050.XI	x	62918_63050	62,993	133	1.88	0.00	PRY2	0	antisense	ORP12	754	antisense	-2.6	SPY domain-containing inorganic phosphate transporter	-2.8	Ubiquitin-specific Protease UBP12
136868_136924.XI	x	136868_136924	136,892	121	2.82	0.00	ATP2	464	antisense	VP50	68	antisense	-2.4	Putative protein of unknown function	-2.8	Vacuolar Protein Sorting 70
448764_448834.XI	x	448764_448834	448,805	175	2.03	0.00	OR1	480	antisense	YMR155	54	antisense	-1.3	Classical Swinepox Virus, Subunit of double-stranded nucleocapsid complex	-2.8	Putative protein of unknown function
684061_684224.XI	x	684061_684224	684,160	164	2.36	0.01	MRP5	775	antisense	IML1	347	antisense	-2.7	Mitochondrial respiratory complex subunit	-2.7	GTPase-activating protein IML1
488019_488051.XI	i	488019_488051	488,100	33	2.30	0.00	OR3	679	antisense	OR3	54	antisense	-1.0	Cytochrome c hemin lyase (Cytochrome c heminase)	-2.7	Cytochrome c hemin lyase (Cytochrome c heminase)
74164_74166.XI	ii	74164_74166	74,239	203	3.12	0.00	OR1	177	antisense	FRM2	337	antisense		Hemoglobin to Bacterial Nitroreductase	-2.7	Type II nitroreductase, using NADH as reductant
274313_274317.XI	i	274313_274317	274,327	187	11.02	0.00	MRP104	447	antisense	OR67	89	antisense	-1.6	Transporter or cytosolic hemoglobin beta 2	-2.7	Galactose 3-phosphate acyltransferase
274313_274317.XI	i	274313_274317	274,327	188	9.00	0.00	MRP104	398	antisense	OR67	89	antisense	-1.6	Transporter or cytosolic hemoglobin beta 2	-2.7	Galactose 3-phosphate acyltransferase
274313_274317.XI	i	274313_274317	274,327	189	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	190	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	191	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	192	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	193	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	194	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	195	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	196	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	197	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	198	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	199	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	200	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	201	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	202	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	203	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	204	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	205	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	206	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	207	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	208	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	209	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	210	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	211	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	212	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	213	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327	214	1.77	0.04	OR1	178	antisense	MR145	176	antisense	-1.6	Putative protein of unknown function	-2.7	Stability of Mitochondrial
274313_274317.XI	i	274313_274317	274,327													

Supplementary Table S11. Yeast TF motif enrichment in PS-specific, DM-specific and PS+DM shared promoter binding sites of potential target genes. Significantly enriched motifs were identified using the MEME Suite v 5.5.5 SEA module. The number of binding site sequences matching a threshold score for each motif is indicated, with supporting P-values and E-values (= P-value * 732 motifs in the YEASTRACT_20130918 database). Enrichment values are relative to frequencies for each motif in randomized primary sequence controls.

motif_ID	motif_consensus	PS-Specific	DM-Specific	PS+DM-Shared	Enrichment Ratio	P-Value	E-Value
Sko1p	TGACGTTT	270			1.3	1.32E-02	9.69E+00
Zap1p	ACCGTCACTGC	254			1.5	4.96E-04	3.63E-01
Dot6p	GCGATGAG	215			1.7	3.17E-03	2.32E+00
Abf1p	RTCAYTNTNTACGR	179			1.5	1.74E-03	1.28E+00
Stp3p	GCTAGCGCA	141			1.6	1.18E-03	8.66E-01
Gln3p	TATTGCTGATAAGGCCNHAA	138			1.7	5.32E-04	3.89E-01
Leu3p	CCGTTAACGG	134			1.4	6.33E-03	4.63E+00
Mcm1p	ATTTCCGAWWTGGGAAANA	82			1.9	2.93E-03	2.15E+00
Fkh1p, Fkh2p	GTMAACAA		393		1.3	1.30E-02	9.49E+00
Crz1p	GGGTGGCTG		74		1.6	1.05E-02	7.68E+00
Reb1p	MGGGTAAAB		43		2.5	8.84E-04	6.47E-01
Abf1p	RTCAYtxxxxACGD		34		2.3	5.75E-03	4.21E+00
Matalpha2p	ATTGTT			30	3.1	1.74E-03	1.27E+00
Total Binding Site Sequences:		545	475	74			

Supplementary Table S12 - Motif discovery in PS and DM binding sites in promoters of yeast DEG using the XSTREME module of MEME 5.5.5 suite (<https://meme-suite.org/meme/tools/xstreme>). Consensus sequences for enriched motifs are shown. Comparison with yeast TF motifs was facilitated using the Tomtom search tool.

Alt_ID	Logo	Consensus	Width (bp)	Sites	Total Sites	Percent Total Sites	P-Value	E-Value	Yeast Motif Comparison (Tomtom)	
									Motif ID	Motif Consensus
PS-Specific Binding Sites										
MEME-1		AAAAAAAAAGAAAA	15	87	542	16.05%	9.55E-05	6.80E-26	Azf1p	AAAAGAAA
MEME-2		GMA RCARCARCAGCA	15	29	458	6.33%	2.02E-03	4.10E-07	Rfx1p	CTATTGCTGCAAC
SEA-1		RTCDYWWTBHACGR	14	22	429	5.13%	4.40E-05	3.22E-02	Abf1p	RTCAYTNTNTACGR
SEA-2		RTCD CDWNDNACGD	14	25	429	5.83%	3.30E-05	2.42E-02	Abf1p	RTCAYTN NNNACGD
DM-Specific Binding Sites										
MEME-1		GAAAAAAAAAAAAA	15	170	475	35.79%	5.51E-07	8.60E-65	Azf1p	AAGAAAAA
STREME-1		AGAAAAAGAAAAAA	14	61	475	12.84%	4.30E-02	1.70E-01	Azf1p	AAGAAAAA
PS+DM Shared Binding Sites										
MEME-1		AAAMSARRAAAAAA	15	26	74	35.14%	2.10E-04	3.00E-06	Azf1p	AAGAAAAA