Supplementary Information

Proto-genes and *de novo* gene birth

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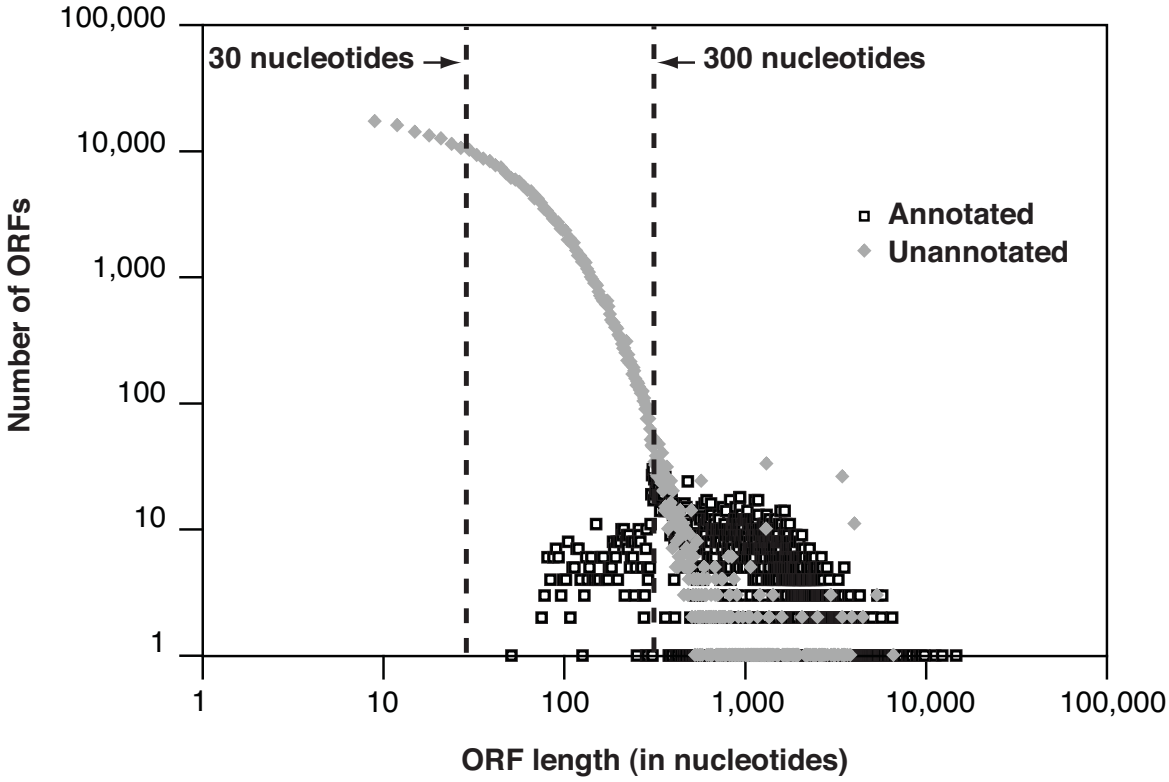
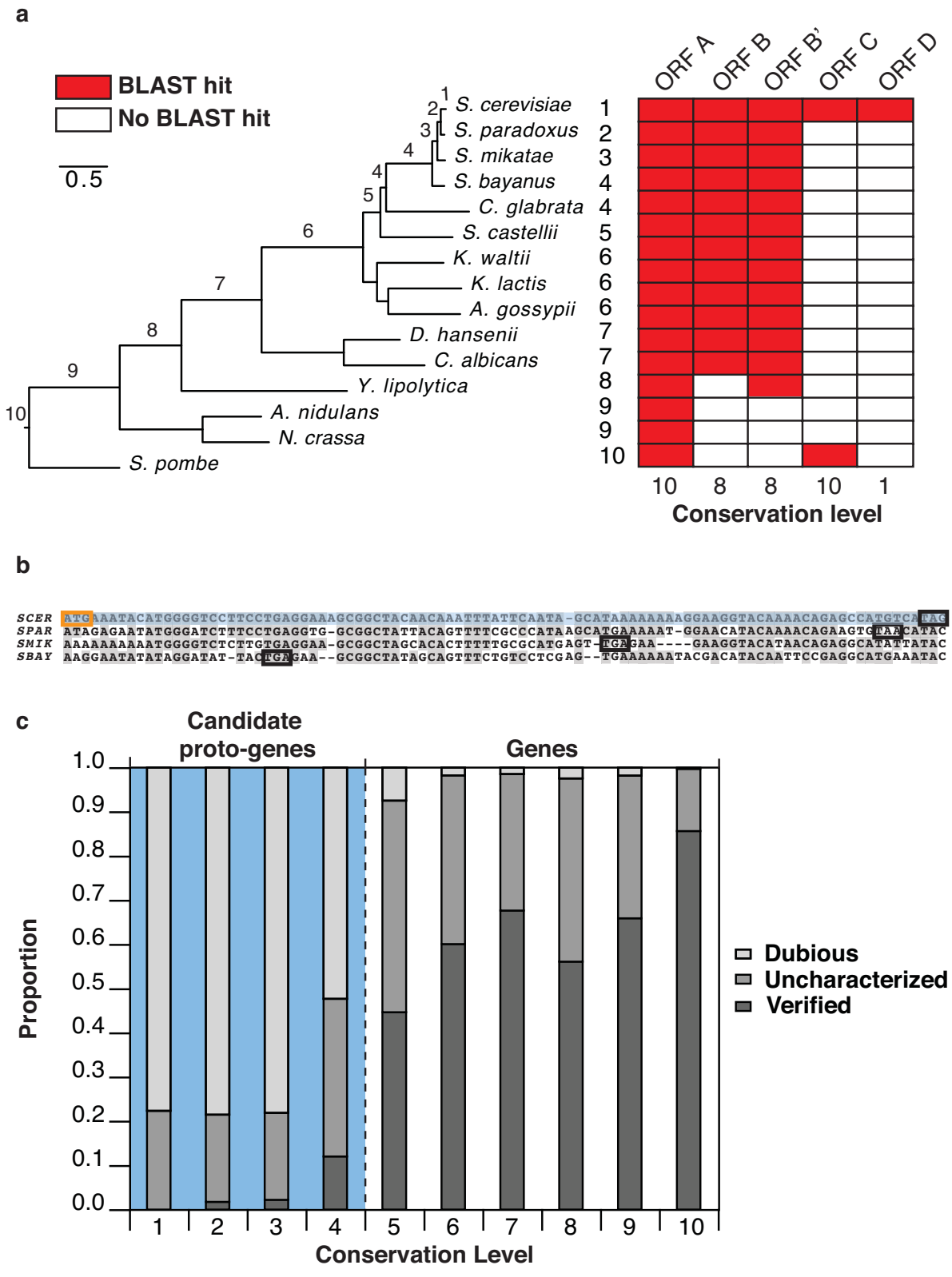
Contents

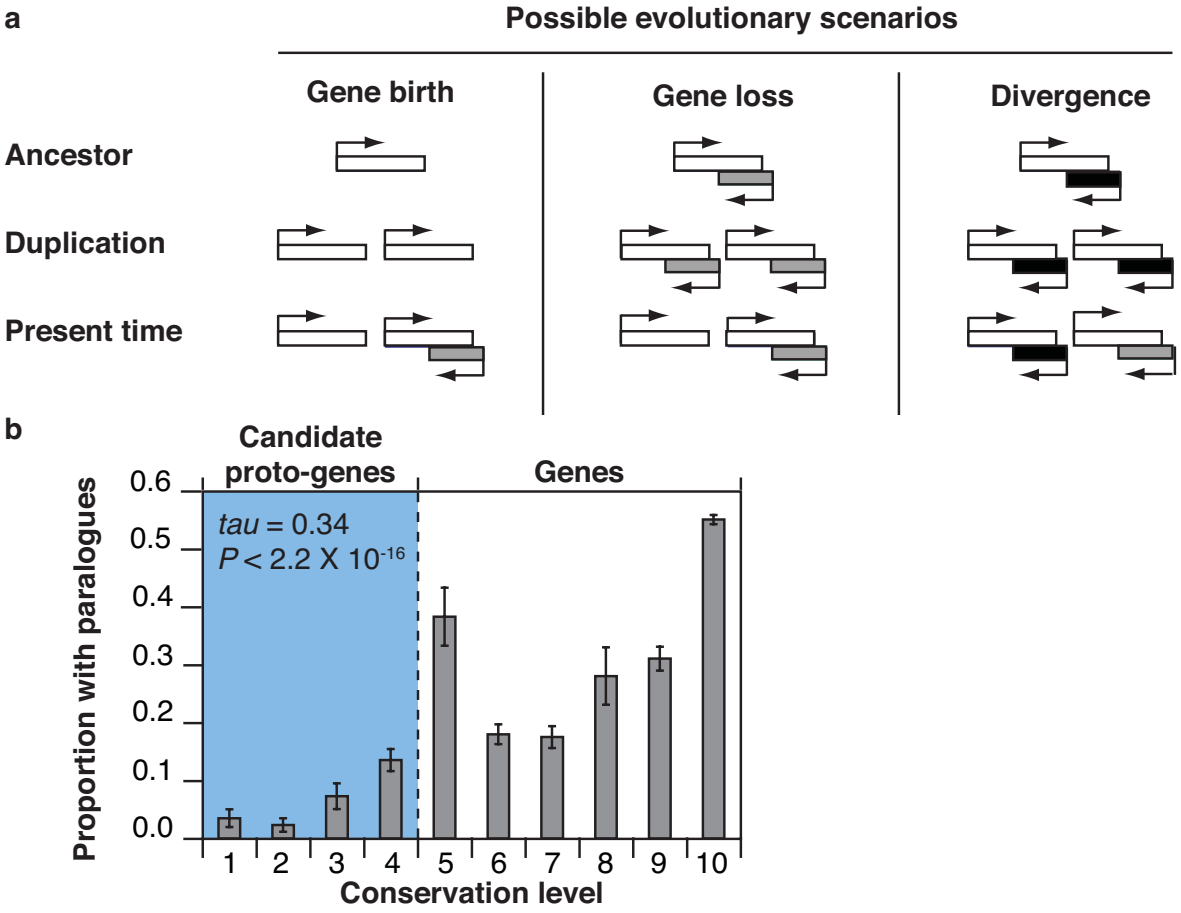


Supplementary Fig. 1. Length distribution of annotated and unannotated ORFs in *S. cerevisiae* genome. Unannotated ORFs are considered mostly non-genic, whereas annotated ORFs are considered mostly to be genes. We propose that both categories contain some proto-genes. The threshold of 300 nucleotides commonly used to annotate genes is indicated, as is the threshold of 30 nucleotides we selected to consider unannotated ORFs to be $ORFs_0$ together with other criteria. Of ~261,000 unannotated ORFs (containing at least three codons, *i.e.* one codon in addition to the start and stop codons), 1,805 have a length of 300 nucleotides or more. Of these, 652 (~36%) partially or fully overlap annotated ORFs on the same strand but in another reading frame, and 1,132 (~63%) on the complementary strand.

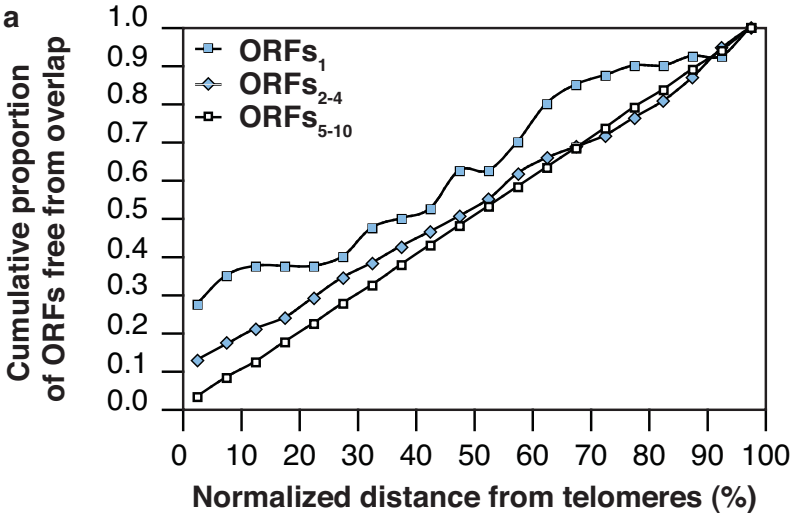

a
BLAST hit
No BLAST hit
0.5
S. cerevisiae
S. paradoxus
S. mikatae
S. bayanus
C. glabrata
S. castellii
K. waltii
K. lactis
A. gossypii
D. hansenii
C. albicans
Y. lipolytica
A. nidulans
N. crassa
S. pombe
ORF A
ORF B
ORF B'
ORF C
ORF D
10 8 8 10 1
Conservation level
b
SCER
SPAR
SMIK
SBAY
c
Candidate proto-genes
Genes
Proportion
Conservation Level
Dubious
Uncharacterized
Verified

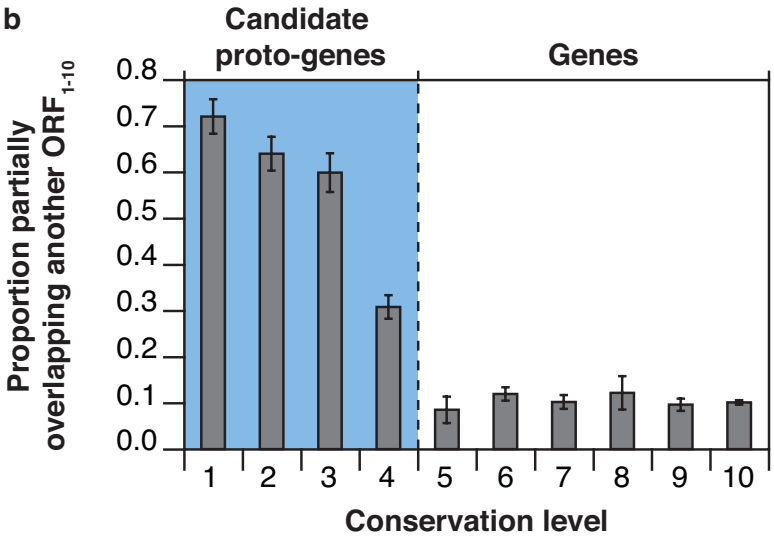
Supplementary Fig. 2. Estimating the conservation level of annotated ORFs. a, The sequence of every annotated ORF in *S. cerevisiae* (represented by the ORFs A, B, B', C and D, where ORFs B and B' are paralogues) is compared to every protein and nucleotide sequence of the 14 other yeast species in the phylogenetic tree (Supplementary Information). Positive sequence similarity hits are represented by red rectangles, and absence of positive hits by white rectangles. The 11 nodes along the *S. cerevisiae* lineage in this tree form 10 conservation levels. ORF A shares sequence similarity with every species in the tree, and is thus assigned the maximum level of conservation. ORF B shares sequence similarity with species up to *C. albicans* but since its paralogue ORF B' shares similarity with species up to *Y. lipolytica*, which corresponds to level 8 of conservation, ORF B is also assigned level 8 of conservation. ORF C only shares similarity with *S. pombe* and is assigned the level 10 of conservation, under the assumption that it is ancient and that it may have been lost from all the intermediary yeast species in the tree except *S. cerevisiae*, or that it is fast-evolving and thus difficult to detect in these intermediate genomes. ORF D does not share sequence similarity with any species in the tree; it is specific to *S. cerevisiae* and is assigned level 1 of conservation. **b**, Example of an ORF_1 (YOL038C-A). The 96 nucleotide ORF, presenting both start (orange box) and stop (black boxes) codons, is aligned with syntenic regions in three other *Saccharomyces sensu stricto species* (*SCER*: *S. cerevisiae*; *SPAR*: *S. paradoxus*; *SMIK*: *S. mikatae*; *SBAY*: *S. bayanus*). One A-to-G mutation in *SPAR* would suffice to generate a start codon, which would then lead to the emergence of an ORF. Translation from the position of the presumptive start codon in *SMIK* or *SBAY* species would engender prematurely terminated polypeptides. **c**, Annotation quality reflects conservation, with most $ORFs_{5-10}$ being verified genes. SGD classifies $ORFs_{1-10}$ into three categories partly based on conservation (text adapted from http://www.yeastgenome.org/help/glossary.html):

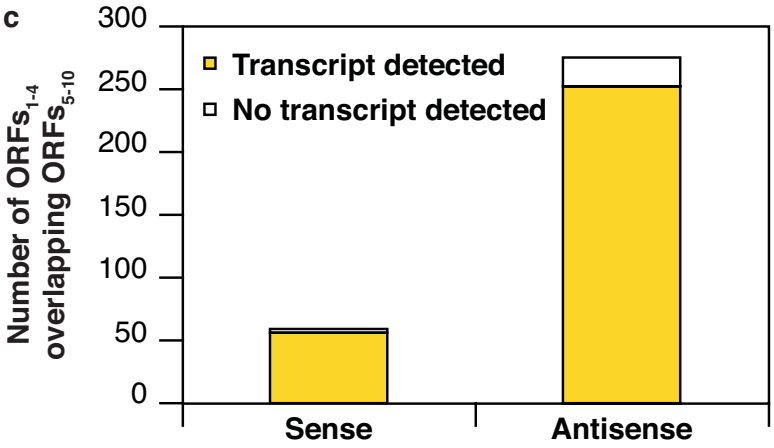
- Verified: $ORFs_{1-10}$ for which experimental evidence exists that a gene product is produced in *S. cerevisiae*. Most ORFs in this class have been given gene symbols (e.g., *PAU8*).
- Uncharacterized: $ORFs_{1-10}$ likely to encode an expressed protein, as suggested for instance by the existence of orthologues in one or more other species, but for which there are no specific experimental data demonstrating that a gene product is actually produced in *S. cerevisiae*. While most Uncharacterized $ORFs_{1-10}$ have systematic names only (e.g., YKL100C), a few have been given gene symbols. Evidence from large-scale analyses indicating that an ORF_{1-10} may be biologically relevant is sometimes but not always enough to upgrade an ORF_{1-10} from Uncharacterized to Verified.
- Dubious: $ORFs_{1-10}$ unlikely to encode an expressed protein. Dubious $ORFs_{1-10}$ may match some or all of the following criteria: 1) the ORF_{1-10} is not conserved in other *sensu stricto* species; 2) there is no well-controlled, small-scale, published experimental evidence that a protein is produced; 3) a phenotype caused by disruption of the ORF_{1-10} can be ascribed to mutation of an overlapping gene; 4) the ORF_{1-10} does not contain an intron. Many $ORFs_{1-10}$ classified as Dubious are small and overlap a larger ORF_{1-10} that is classified as Verified or Uncharacterized; however, overlap with another ORF_{1-10} does not mandate that an ORF be classified as Dubious. Most $ORFs_{1-4}$ (66%) are classified as Dubious.



Supplementary Fig. 3. Duplication events as controls for estimations of ORFs conservation level. a, Distinguishing recent gene emergence from rapid sequence divergence. Three evolutionary scenarios lead to the same observation, namely that a gene that appears species-specific (grey boxes) overlaps a gene of higher conservation level (white boxes) which has a paralogue. Antisense overlap was chosen for representation purposes only. Left: the species-specific gene truly appeared recently, likely *de novo*. Right: the ancestor gene overlapped another gene (black) before duplicating and recent sequence divergence led to the illusion of species-specificity. Middle: the ancestor overlapped a gene before duplicating, but all the paralogues of this gene were independently lost; if all its orthologues and paralogues were also lost independently in the other yeast species, its sequence would appear species-specific although in reality it is of ancient origin. Only 4 out of 145 paralogues of $ORFs_{10}$ that overlap an ORF_1 also overlap another $ORF_{1\text{-}10}$. Although the $ORFs_1$ could have recently and independently lost their paralogues, as well as all of their homologues in 14 other yeast species, the most parsimonious scenario is that they appeared recently, likely *de novo*, after and independently from the duplication events. **b,** Proportion of $ORFs_{1\text{-}10}$ with at least one paralogue. A positive correlation between conservation level and number of duplicates, with a peak reflecting the whole-genome duplication event[31], confirms the accuracy of our conservation level estimations. Error bars: standard error of the proportion. *P* and *tau*: Kendall's correlation statistics.

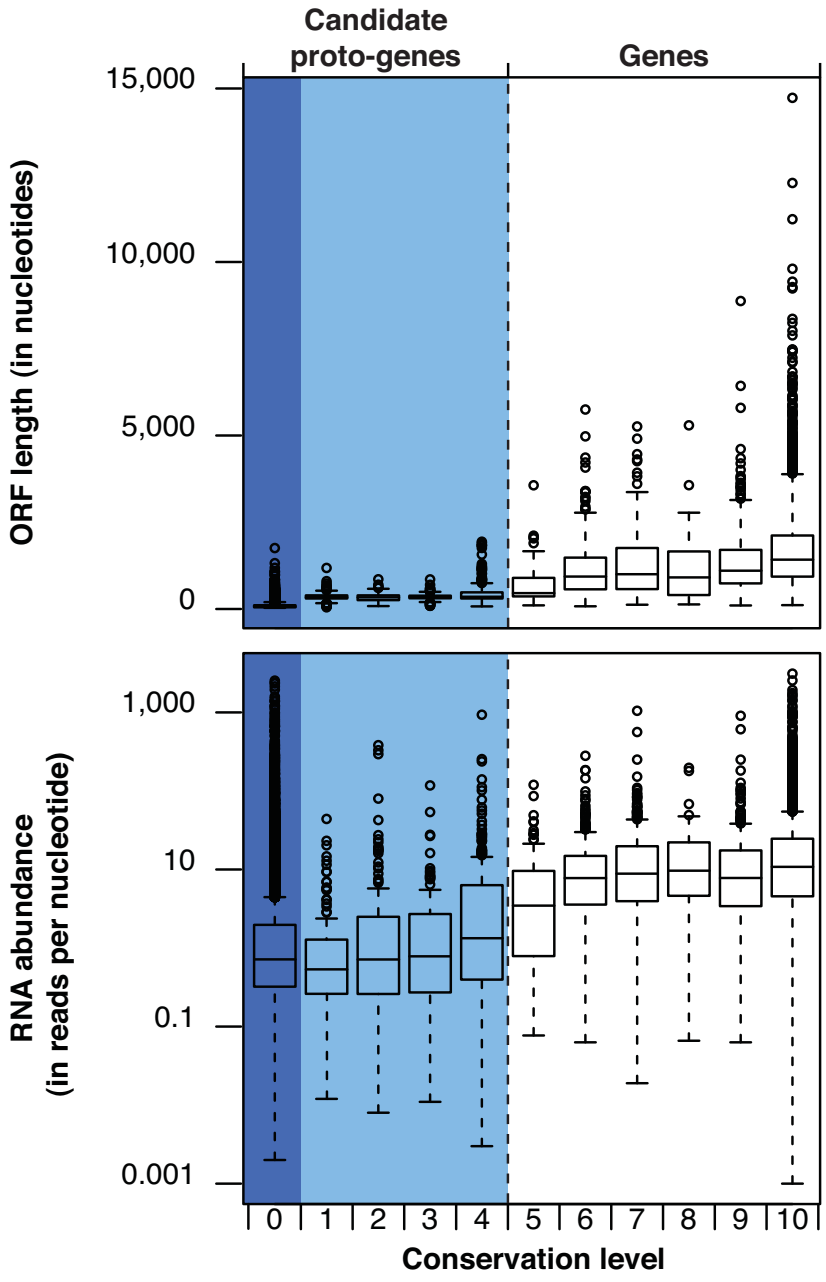

a
Cumulative proportion of ORFs free from overlap
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
ORFs1
ORFs2-4
ORFs5-10
0 10 20 30 40 50 60 70 80 90 100
Normalized distance from telomeres (%)

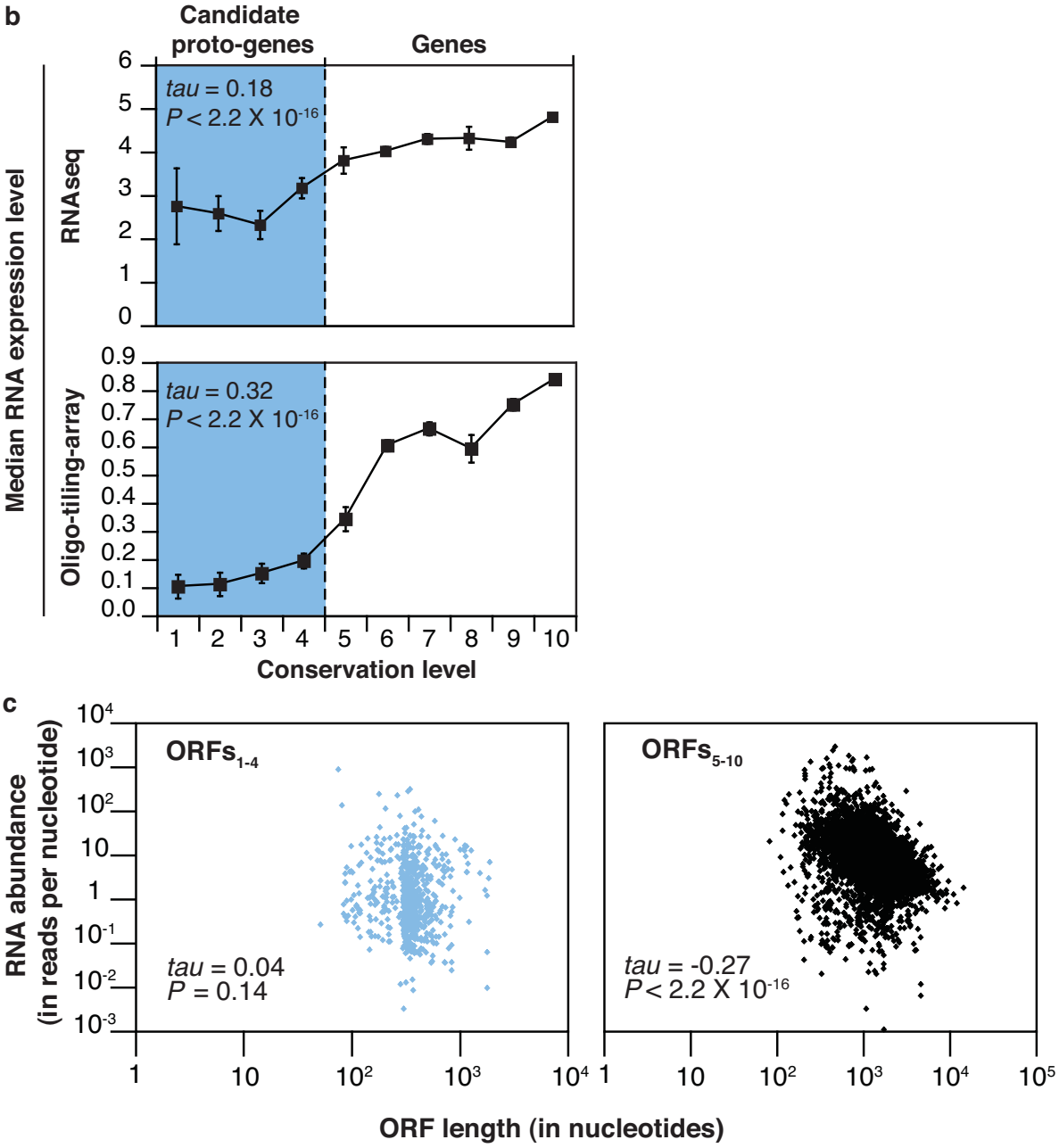

b
Candidate proto-genes
Genes
Proportion partially overlapping another ORF1-10
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1 2 3 4 5 6 7 8 9 10
Conservation level


c
Number of ORFs1-4 overlapping ORFs5-10
300
250
200
150
100
50
0
Transcript detected
No transcript detected
Sense
Antisense

Supplementary Fig. 4. Chromosomal locations of $ORFs_{1\text{-}4}$ are consistent with recent *de novo* origination. a, Preferential subtelomeric location of non-overlapping $ORFs_{1\text{-}4}$. Abscissa: distance between $ORFs_{1\text{-}10}$ and telomeres normalized by the distance between centromeres and telomeres, for all *S. cerevisiae* chromosomes, where 100% represents the total distance between the corresponding centromere and telomere. Ordinate: cumulative proportion of non-overlapping $ORFs_{1}$, $ORFs_{2\text{-}4}$ and $ORFs_{5\text{-}10}$. The high sequence variability of subtelomeric regions may facilitate *de novo* emergence. **b,** $ORFs_{1\text{-}4}$ tend to partially overlap $ORFs_{1\text{-}10}$. Proportion of partially overlapping $ORFs_{1\text{-}10}$ as a function of conservation level. Fully overlapping $ORFs_{1\text{-}10}$ were excluded from the dataset. Error bars: standard error of the proportion. That $ORFs_{1\text{-}4}$ often partially overlap $ORFs_{1\text{-}10}$ argues against origination by cross-species transfer. Furthermore, since non-coding strands of genes are markedly depleted in stop codons[32] and may also offer more ready access to the transcription machinery, such chromosomal location could favour *de novo* origination. Examples of this “overprinting” mechanism have been described in vertebrates[33]. Finally, there are twice as many nucleotides in non-genic sequences that overlap an $ORF_{1\text{-}10}$ than in non-genic sequences that do not in the compact *S. cerevisiae* genome. **c,** Most overlapping $ORFs_{1\text{-}4}$ overlap an $ORF_{5\text{-}10}$ on the antisense strand. Transcript detection: unambiguous assignment of strand-specific RNAseq reads from rich or starvation conditions[25] to the $ORFs_{1\text{-}4}$ (Supplementary Fig. 6). The 48 $ORFs_{1\text{-}4}$ that overlap another $ORF_{1\text{-}4}$ are not taken into account in this analysis.

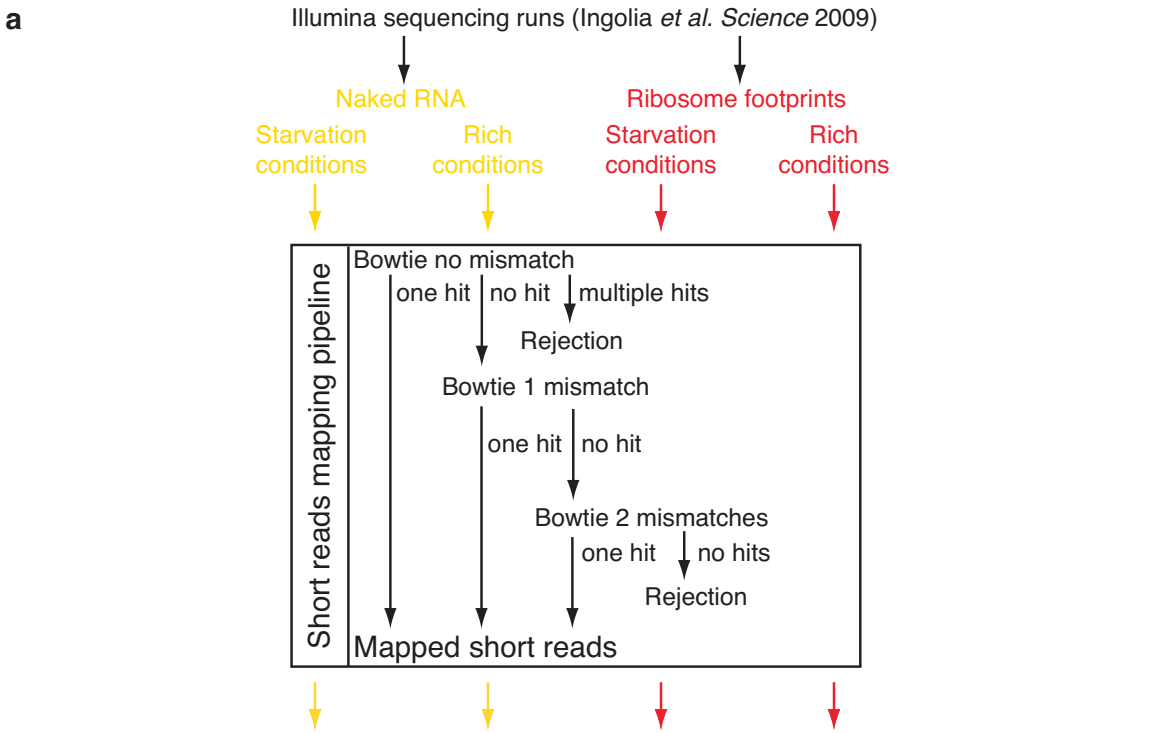
a

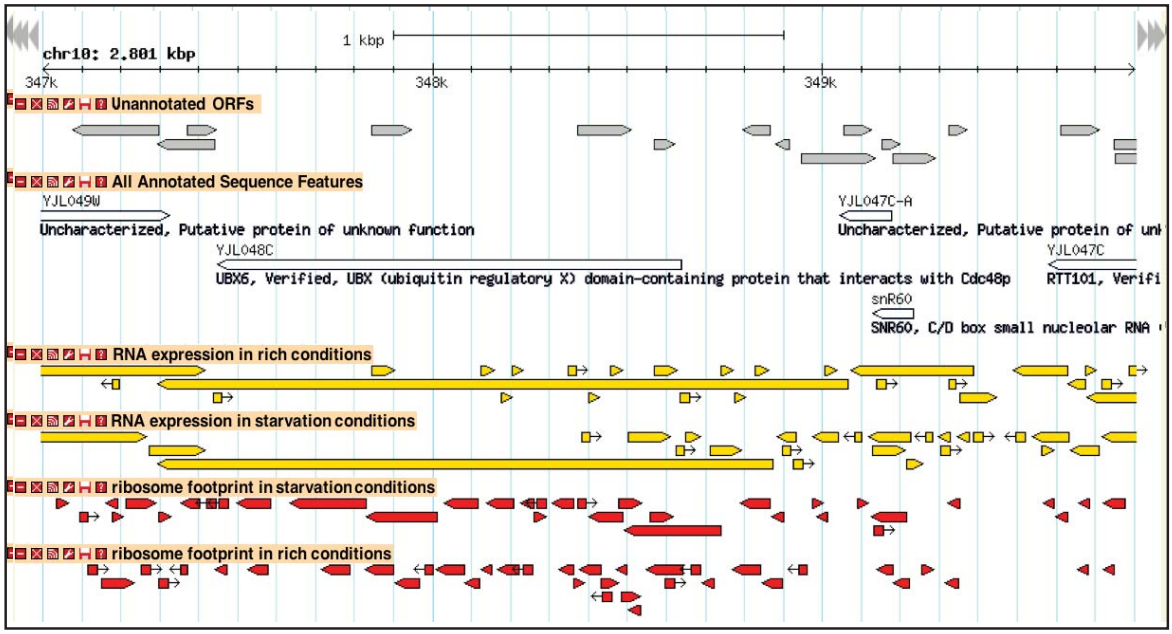

Candidate proto-genes
Genes
ORF length (in nucleotides)
15,000
10,000
5,000
0
RNA abundance (in reads per nucleotide)
1,000
10
0.1
0.001
0
1
2
3
4
5
6
7
8
9
10
Conservation level

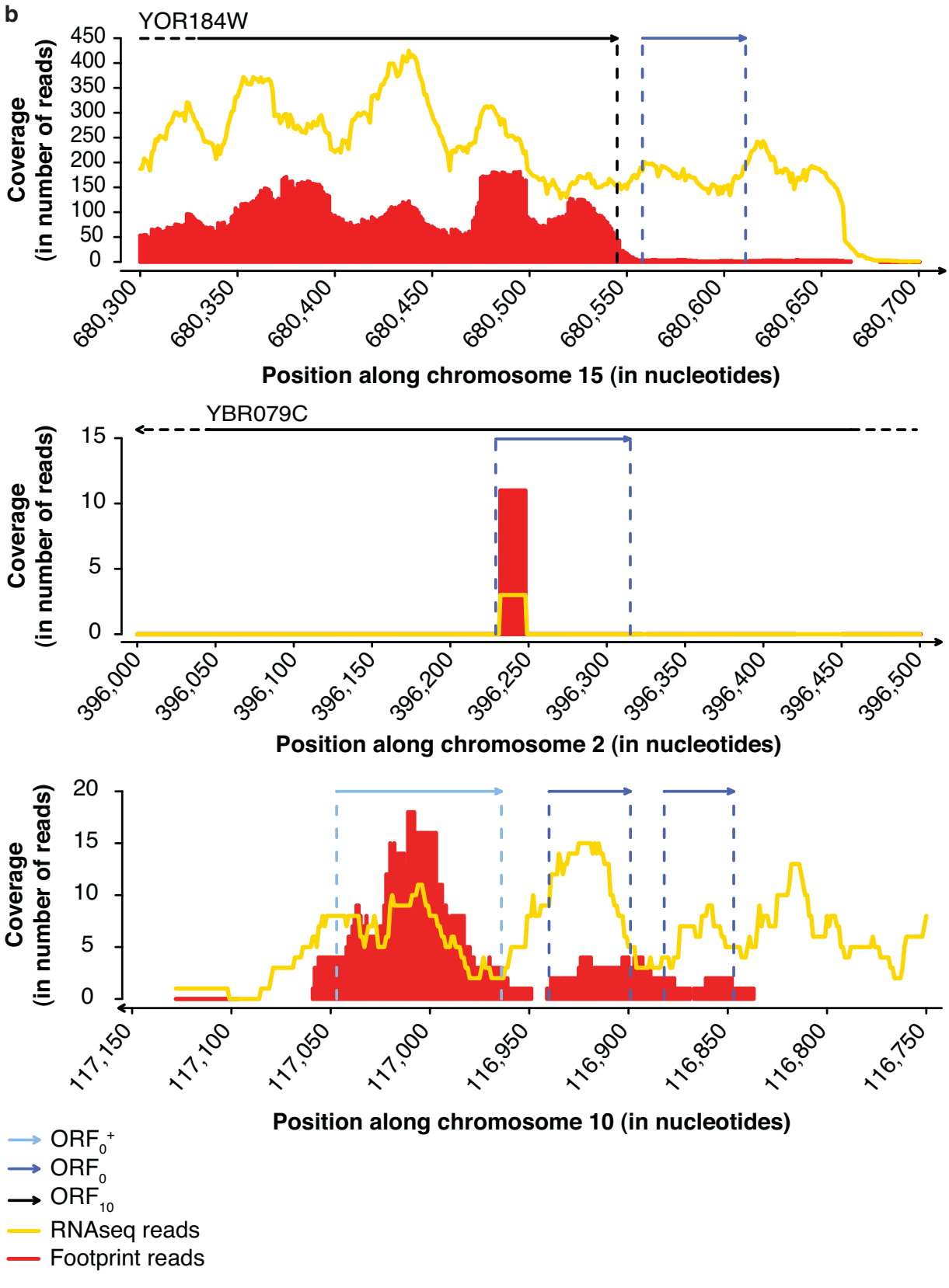


Supplementary Fig. 5. Relationship between ORF expression level, conservation level and length. a, Length (top) and expression level (bottom) of ORFs correlate positively with conservation level. Box plot representations of data presented in Fig. 2a. **b,** Median expression levels of $ORFs_{1\text{-}10}$ within each conservation level. Estimation of RNA abundance from RNAseq (upper panel)[18] and oligo-tiling array (lower panel)[53] (see Supplementary Information for description of the corresponding expression level units). Error bars represent s.e.m. **c,** A negative correlation between expression level and ORF length is observed for $ORFs_{5\text{-}10}$ but not for $ORFs_{1\text{-}4}$. Estimation of RNA abundance from RNAseq[25] in rich conditions. *P* and *tau*: Kendall's correlation statistics.

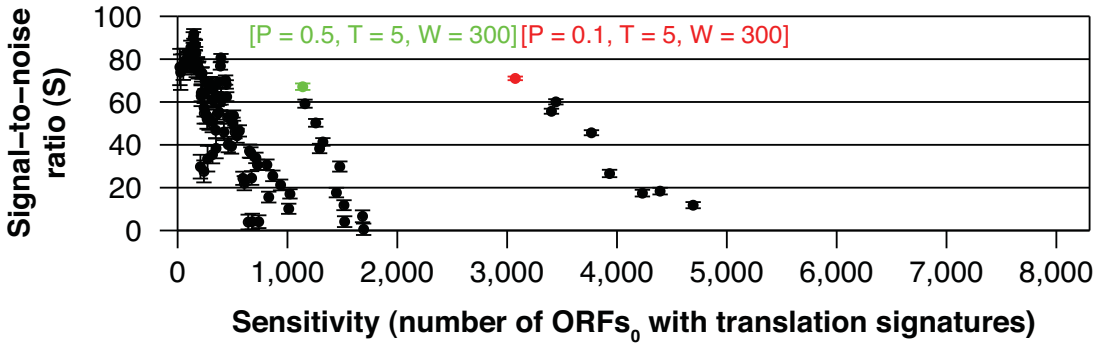
a


Illumina sequencing runs (Ingolia *et al. Science* 2009)
Naked RNA
Ribosome footprints
Starvation conditions
Rich conditions
Starvation conditions
Rich conditions
Short reads mapping pipeline
Bowtie no mismatch
one hit
no hit
multiple hits
Rejection
Bowtie 1 mismatch
one hit
no hit
Bowtie 2 mismatches
one hit
no hits
Rejection
Mapped short reads

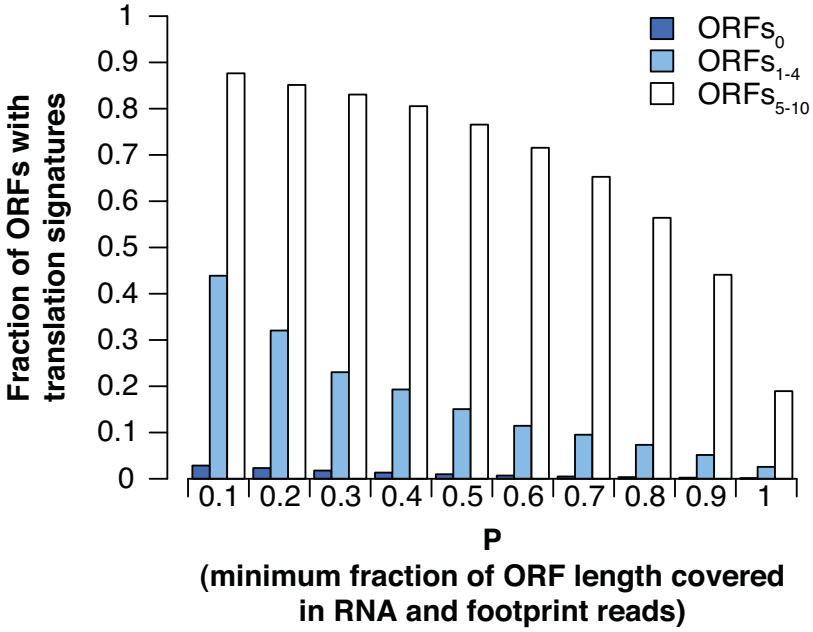

chr10: 2,801 kbp
1 kbp
347k
348k
349k
Unannotated ORFs
All Annotated Sequence Features
YJL049W
Uncharacterized, Putative protein of unknown function
YJL048C
UBX6, Verified, UBX (ubiquitin regulatory X) domain-containing protein that interacts with Cdc48p
YJL047C-A
Uncharacterized, Putative protein of unk
YJL047C
RTT101, Verifi
snR60
SNR60, C/D box small nucleolar RNA
RNA expression in rich conditions
RNA expression in starvation conditions
ribosome footprint in starvation conditions
ribosome footprint in rich conditions

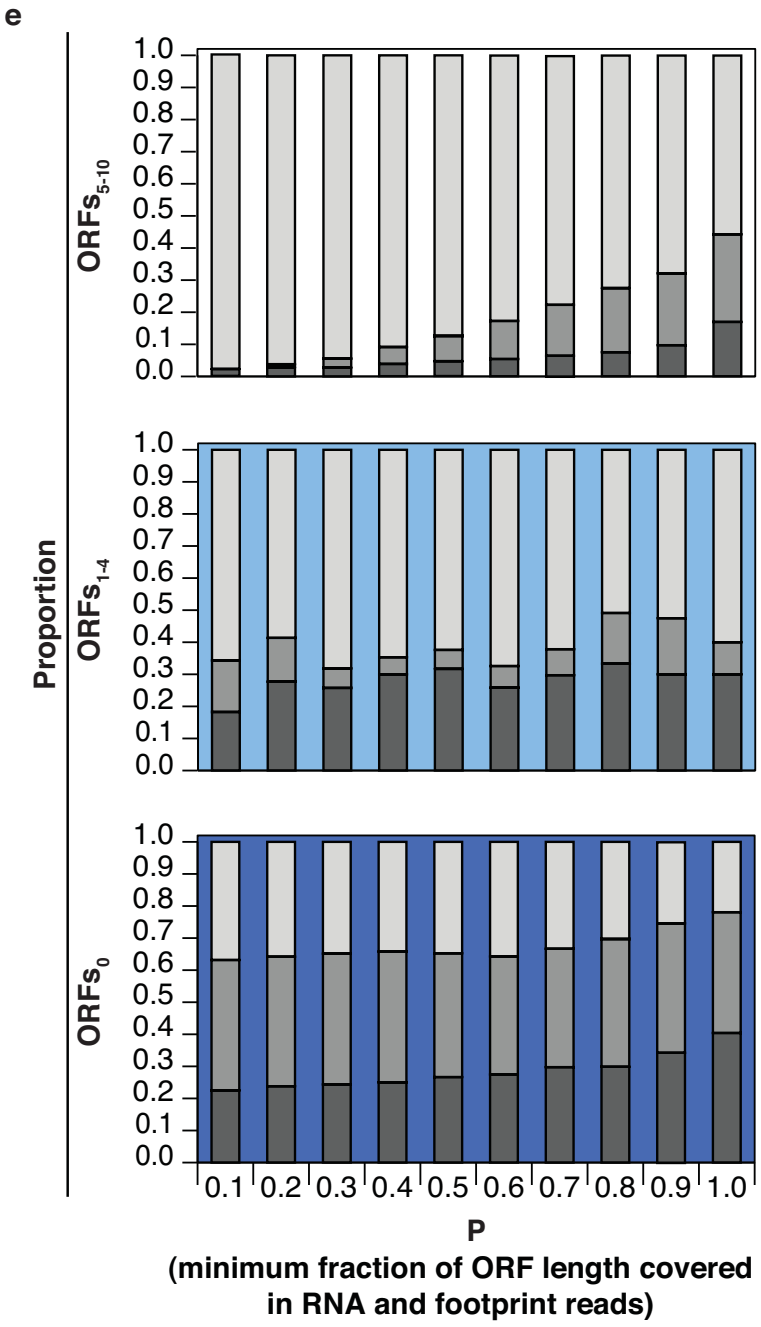

b
YOR184W
Coverage (in number of reads)
450
400
350
300
250
200
150
100
50
0
680,300
680,350
680,400
680,450
680,500
680,550
680,600
680,650
680,700
Position along chromosome 15 (in nucleotides)
YBR079C
Coverage (in number of reads)
15
10
5
0
396,000
396,050
396,100
396,150
396,200
396,250
396,300
396,350
396,400
396,450
396,500
Position along chromosome 2 (in nucleotides)
Coverage (in number of reads)
20
15
10
5
0
117,150
117,100
117,050
117,000
116,950
116,900
116,850
116,800
116,750
Position along chromosome 10 (in nucleotides)
ORF0+
ORF0
ORF10
RNAseq reads
Footprint reads

c

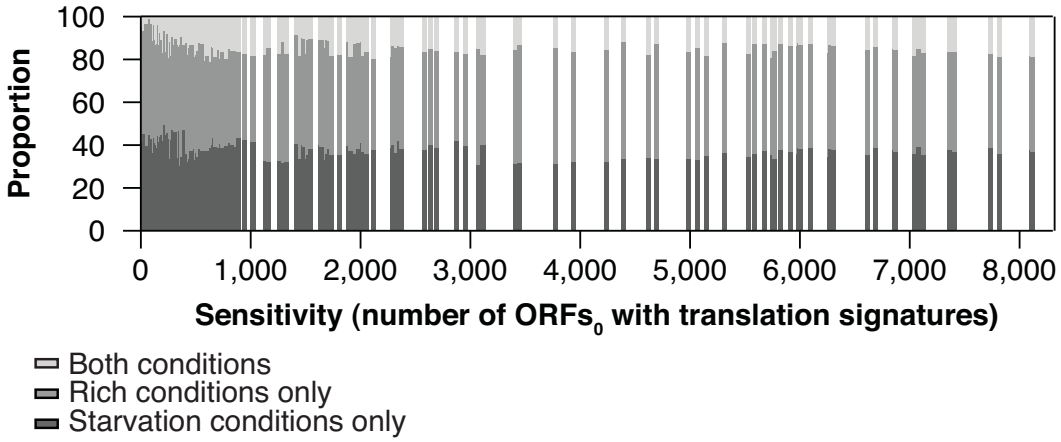

[P = 0.5, T = 5, W = 300]
[P = 0.1, T = 5, W = 300]
Signal−to−noise ratio (S)
100
80
60
40
20
0
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
Sensitivity (number of ORFs0 with translation signatures)

d

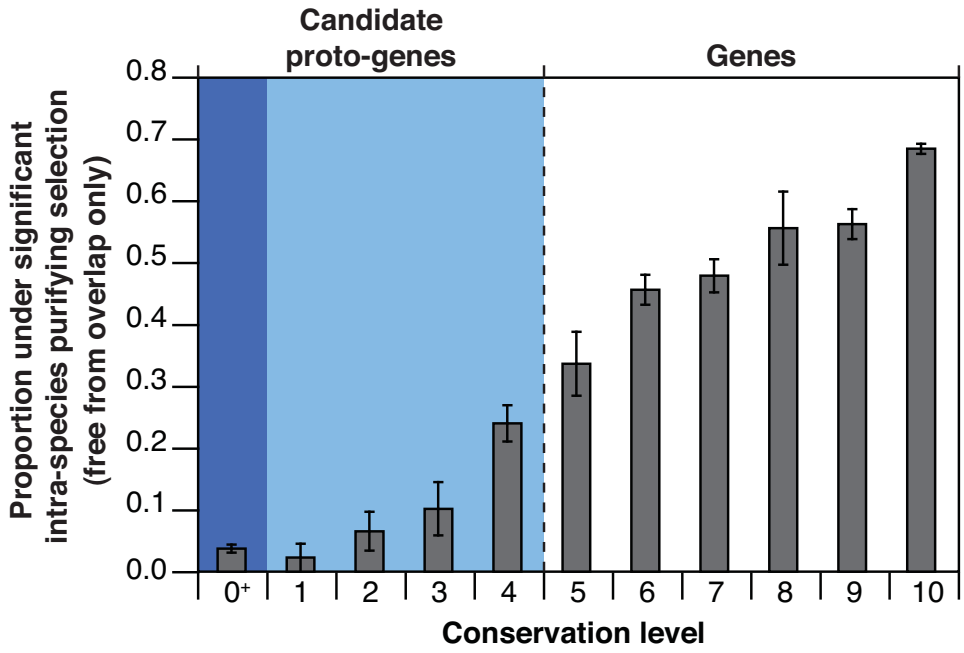

ORFs0
ORFs1-4
ORFs5-10
Fraction of ORFs with translation signatures
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
P
(minimum fraction of ORF length covered in RNA and footprint reads)


e
Proportion
ORFs5-10
ORFs1-4
ORFs0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
P
(minimum fraction of ORF length covered in RNA and footprint reads)
Both conditions
Rich conditions only
Starvation conditions only

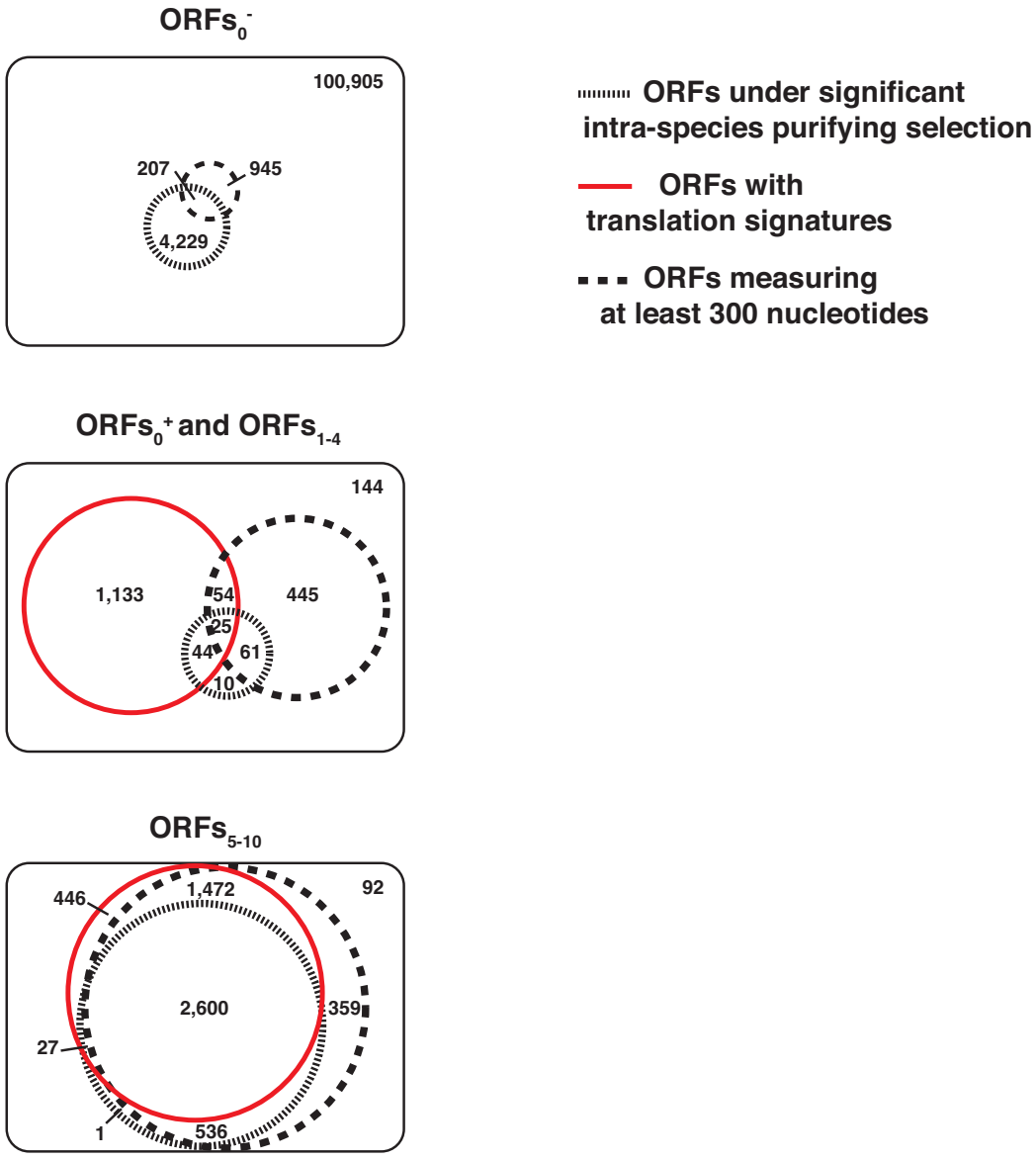
f



Supplementary Fig. 6. Defining translation signatures of *S. cerevisiae* ORFs. a, Bioinformatics pipeline for the mapping of short RNA and footprint sequence reads on the genome sequence of *S. cerevisiae*. Mapping vizualisation prepared with the SGD Genome Browser. **b,** Examples of true and false negatives. Top: True negative. The ORF_0 is located immediately downstream of an ORF_{10}, suggesting that the corresponding transcription and translation signals could result from stop codon read-through. Middle: True negative. Only a small fraction of the ORF_0 is covered by RNA and footprint reads, which could reflect a ribosomal activity other than full-length ORF translation. Bottom: False negatives. Of the three represented $ORFs_0$, only one (labelled ORF_0^+) is considered translated, as a result of the stringent criteria used. **c,** The signal-to-noise ratios of 91 parameter sets that reject null model 1 and 2 are shown. Error bars represent s.e.m. **d,** Translation of candidate proto-genes. The number of ORFs showing translation signatures is shown when various P parameters are applied. For $ORFs_0$, T = 5 and W = 300 across all values of P. With $P \geq 0.5$, 1,139 $ORFs_0$, 117 $ORFs_{1\text{-}4}$ and 4,545 $ORFs_{5\text{-}10}$ show evidence of translation. **e,** Condition-specific translation of candidate proto-genes, but not of $ORFs_{5\text{-}10}$, is robust to variations of P. For $ORFs_0$, T = 5 and W = 300 across all values of P. **f,** Condition-specific translation of $ORFs_0$ is observed with 168 combination of P, T and W. Each tricolour column corresponds to one parameter set.



Supplementary Fig. 7. Signatures of intra-species purifying selection among ORFs free from overlap with annotated ORFs. Error bars represent standard error of the proportion.



Supplementary Fig. 8. Characterization of 113,735 *S. cerevisiae* ORFs by their conservation, length, translation and retention by natural selection. Top: 106,286 unannotated ORFs that do not show signatures of translation ($ORFs_0^-$). Middle: 1,916 candidate proto-genes consisting of 1,139 unannotated ORFs that show signatures of translation ($ORFs_0^+$) and 777 weakly conserved annotated ORFs ($ORFs_{1-4}$). Bottom: 5,533 conserved annotated ORFs ($ORFs_{5-10}$). ORFs presenting in-frame stop codons in any *S. cerevisiae* strain were considered as not undergoing significant purifying selection. Venn diagrams are not drawn to scale.

Supplementary Methods

Supplementary Methods 1: Sequence analyses and evolutionary interpretations

We compared the sequence of the S288C reference strain of *S. cerevisiae* with i) sequences of 14 other yeast species and ii) sequences of seven other strains of *S. cerevisiae*. We used the reference genome sequences and accompanying annotations downloaded in October 2007 by the *Saccharomyces* Genome Resequencing Project group (SGRP)[34] from the *Saccharomyces* Genome Database (SGD)[16]. Paralogy relationships among annotated open reading frames (ORFs) of *S. cerevisiae* were downloaded from the Ensembl Compara website[35].

Comparative analysis between yeast species

To evaluate the evolutionary time-frame at which the ancestor sequence of each annotated ORF most likely appeared, we compared the nucleotide and amino acid sequences of each annotated ORF with sequences from 14 other yeast species (*Saccharomyces paradoxus, Saccharomyces mikatae, Saccharomyces bayanus, Candida glabrata, Saccharomyces castellii, Kluyveromyces lactis, Ashbya (Eremothecium) gossypii, Kluyveromyces (Lachancea) waltii, Debaryomyces hansenii, Yarrowia lipolytica, Candida albicans, Aspergillus nidulans, Neurospora crassa,* and *Schizosaccharomyces pombe*) that we

mapped on an evolutionary tree (Fig. 1c and Supplementary Fig. 2). Sequences, annotations and orthology relationships for these species were downloaded in September 2007 from websites listed at http://www.broad.mit.edu/regev/orthogroups/[36].

Generation of the evolutionary tree

To infer the phylogeny of the 15 yeast species, we first used the MUSCLE alignment software[37] to align all one-to-one orthologues across these species, and concatenated these alignments. We then created 1,218 hypothetical peptide alignments by sampling each time 10,000 positions from this concatenated alignment. The phylogeny was reconstructed using the maximum likelihood method as implemented in the proml program of the PHYLIP software package[38]. This sampling process was repeated 10 times, generating the same phylogeny each time, with the exception of the nodes separating *S. castellii*, *C. glabrata*, and the *Saccharomyces sensu stricto* species. Reconstructions sometimes indicated that *S. castellii* was monophyletic with the *Saccharomyces sensu stricto* group, and sometimes that *S. castellii* was more closely related to *C. glabrata*. We decided to consider the *Saccharomyces sensu stricto* group more closely related to *C. glabrata* than to *S. castellii*, based on prior genome reconstructions[39].

Conservation level calculations

We classified *S. cerevisiae* ORFs within 11 levels of conservation, numbered

from 0 to 10 according to the phylostratigraphy principle[1].

Level 0 contains 107,425 unannotated ORFs ($ORFs_0$), defined as any sequence between canonical start and stop codons that is i) longer than 30 nucleotides, ii) a multiple of three, iii) not overlapping an annotated ORF, an rRNA, a tRNA, a ncRNA, a snoRNA or an upstream ORF[25] on the same strand. We did not include ORFs of length shorter than 30 nucleotides in the set of $ORFs_0$ because they would have prevented all of the analyses performed in this manuscript that involve sequence analyses tools such as BLAST, which are challenged when applied to very short sequences. Unannotated ORFs overlapping an annotated sequence feature on the same strand were also excluded from the set of $ORFs_0$ because their conservation level would be indistinguishable from that of the features they overlap, and because other analyses performed throughout the manuscript could not have been applied readily (*i.e.* estimations of strength of purifying selection or estimations of expression level).

The conservation level of each annotated ORF was defined as the depth of the node separating *S. cerevisiae* from the most distant species in which any sequence similarity with this ORF, or any of its paralogues, could be detected. Finding such similarities for each annotated ORF required the following steps: i) extracting the ORF-specific sequence that did not overlap another annotated ORF; ii) matching this sequence against genomic and protein sequences from each of the other yeast species one by one, using three distinct BLAST programs (BLASTP, TBLASTX, TBLASTN)[40] with a relaxed *E* value threshold of less than

0.01; iii) measuring the depth of the node separating *S. cerevisiae* and the species showing a positive hit for the ORF sequence. The greatest depth value was marked as the conservation level of the ORF, except when the ORF had a more conserved paralogue.

We encountered a class of annotated ORFs that, while conserved only up to a certain level in the phylogeny of yeasts, had paralogues that were more conserved. Members of this class may have first evolved *de novo*, then duplicated and fused to pre-existing genes, in a mechanism similar to that which apparently gave birth to the *Drosophila* gene *Jingwei*[41]. An alternative would be that a portion of conserved ORFs diverged first, and subsequent duplication events engendered seemingly younger ORFs. We opted for the latter scenario, and assigned to each annotated ORF the conservation level of its most conserved paralogue, in an effort to avoid underestimating conservation.

Only five *S. cerevisiae* annotated ORFs had homologues in *C. glabrata* but not in *S. castellii*, which can be explained by the small size of the *C. glabrata* genome, or by the short evolutionary distance between *C. glabrata* and *S. castellii* as measured by sequence similarity. To avoid counting five ORFs as an entire category, we grouped them with the immediate lower conservation level (Supplementary Fig. 2). For simplification, *C. glabrata* is not represented in Fig. 1c. Annotated ORFs are classified within 10 levels of conservation, numbered from 1 to 10 ($ORFs_{1\text{-}10}$).

A caveat is the potential incompleteness of some genome sequences used for the comparisons. Furthermore, whole genome sequences from other

species that belong to the Ascomycota phylogeny are not available. For this reason, we found that ~5% of $ORFs_{1-4}$ were potentially more conserved when we used BLASTP against the non-redundant protein database of NCBI with relaxed parameters (using an *E* value threshold of 10^{-6} and imposing that at least 30% of the query sequence length was aligned). As expected, $ORFs_0$ were mostly species-specific, with only <1% having homologues outside of *S. cerevisiae* according to the same procedure. Results were robust to slight modifications of the method (different BLAST programs, different *E* value cutoffs).

Evaluating the evolutionary origin of $ORFs_0^+$

We have found 1,139 $ORFs_0$ that show signatures of translation ($ORFs_0^+$, see "Ribosome footprinting" subsection). To be considered as proto-genes, $ORFs_0^+$ must have recently emerged in non-genic sequences. To verify that $ORFs_0^+$ did not originate from gene duplication, we compared their amino acid sequences to that of all annotated ORFs in *S. cerevisiae* using relaxed parameters (BLASTP with *E* value cutoff of 0.01). None of the $ORFs_0^+$ resembled an annotated ORF, and only one was similar to transposable element genes. We further compared the amino acid sequences of $ORFs_0^+$ to that of all annotated ORFs in 14 Ascomycota species using relaxed parameters (BLASTP with *E* value cutoff of 0.01). We found only one ORF_0^+ that resembled any annotated ORFs in the *Saccharomyces sensu stricto* group and none that resembled annotated ORFs outside of this group. The absence of annotated paralogues or orthologues for $ORFs_0^+$ throughout the *S. cerevisiae* lineage suggests that $ORFs_0^+$ did not

originate from gene duplication. Yet, $ORFs_0^+$ could be genes that have not been annotated in any of the 14 studied species because of their short length. To test whether this could be true, we compared the amino acid sequences of $ORFs_0^+$ to the six-frame translation products of the genomes of the 14 species using more stringent parameters (TBLASTN either with *E* value cutoff of 0.01, which is stringent given the size of the sequence database, or 90% identical sequences over 100% of the length of the ORF). We found 136 $ORFs_0^+$ that have similarity with sequences in the *Saccharomyces sensu stricto* group, and 20 that seem more conserved. However, these 20 $ORFs_0^+$ did not present evolutionarily conserved start and stop codons and hence are unlikely to be genes that had remained unannotated because of their short length. In conclusion, $ORFs_0^+$ seem to have recently emerged in non-genic sequences, and can confidently be considered as proto-genes (see "Potential associations with cross-species transfer events" subsection).

Comparative analysis of *S. cerevisiae* strains

To examine intra-species evolution of *S. cerevisiae* ORFs, we compared ORF sequences in the reference strain (S288C) to their sequences in seven other strains (SK1, Y55, DBVPG6765, DBVPG1373, DBVPG6044, YPS606 and W303). Single Nucleotide Polymorphisms (SNPs) from these strains were downloaded from the website of the Sanger Institute *Saccharomyces* Genome Resequencing Project (http://www.sanger.ac.uk/Teams/Team71/durbin/)[34] in March 2010. Sequenced SNPs were analyzed only when their quality score was

higher than 55, as described[34].

A total of 105,023 $ORFs_0$ and 5,723 $ORFs_{1-10}$ (including 137 $ORFs_1$) were present in the eight strains (no disruptive mutations). The strength of selective constraints acting on each of these ORFs was evaluated in two steps: i) homologous nucleotide sequences in each strain were aligned using the MUSCLE program[37]; ii) for each ORF we ran the codeml program of PAML[42] using the JTT substitution matrix to calculate the synonymous (dS) and non-synonymous (dN) substitution rates and to estimate the likelihood of the dN/dS ratio of the ORF given the polymorphism of its sequence across the eight *S. cerevisiae* strains. We recorded this likelihood under two parameter settings. In the first null model setting, the program estimated the likelihood of the data while assuming that the ORF was under neutral selection and that the rates of synonymous and non-synonymous substitutions would be equal (omega = 1). In the second setting, the program returned the likelihood of the data without making this assumption. To obtain a *P* value, we assumed that the log ratio between these likelihoods is chi-square distributed with one degree of freedom. This likelihood ratio test estimated whether the observed substitution rates for the given ORF deviated significantly from neutral expectation. All ORFs with dN/dS < 1 and $P < 0.05$ were considered to be under significant purifying selection.

Potential associations with cross-species transfer events

In *S. cerevisiae*, cross-species transfers (or horizontal gene transfers, HGT) mediated by viruses, or coming from bacteria, are notably rare and the

mechanisms involved are poorly understood. To estimate the maximum proportion of $ORFs_{1\text{-}4}$ that could have originated from HGT, we first reviewed the literature and found four $ORFs_{1\text{-}4}$ that likely originated from HGT[43,44].

We next searched the non-redundant database of protein sequences using stringent parameters (using BLASTP with an *E* value threshold of 10^{-6} and imposing that at least 30% of the query length was aligned). This process revealed four additional $ORFs_{1\text{-}4}$ that may be associated with cross-species transfer because homologues were found outside of the fungi kingdom. Two of them overlapped another ORF, complicating the interpretation of these results.

Transposable elements have been used as a signature of local genomic instability where foreign DNA could be integrated. To find additional candidates for HGT, we surveyed the chromosomal environments of $ORFs_{1\text{-}10}$, focusing on non-overlapping $ORFs_{1\text{-}10}$ (overlapping $ORFs_{1\text{-}10}$ are unlikely to have originated from HGT). The number of $ORFs_{1\text{-}4}$ located in the neighbourhood of a transposable element (within a 2,000 nucleotide window from the start or the stop codon) was not significantly different than for $ORFs_{5\text{-}10}$. The 13 corresponding $ORFs_{1\text{-}4}$ were nevertheless added to the cases described above to constitute a group of 21 $ORFs_{1\text{-}4}$ for which a potential link with HGT could not be ruled out. Note that seven other potential cases of HGT in *S. cerevisiae* described in the literature[45] involve $ORFs_{5\text{-}10}$ that are not located in the vicinity of a transposable element.

While 34 $ORFs_0^+$ were located within 2,000 nucleotides of a transposable element, the overall location of $ORFs_0^+$ relative to transposable elements showed

no significant deviation from that of $ORFs_{1\text{-}10}$. Furthermore, $ORFs_0^+$ encoded polypeptides specific to *S. cerevisiae* according to available genomic databases containing bacterial and viral sequences (BLASTP against the NR database with a relaxed *E* value cutoff of 0.01), also supporting their *de novo* origination rather than origination from HGT.

Comparing $ORFs_0^+$ and other $ORFs_0$

We investigated whether $ORFs_0^+$ were in any way different from other $ORFs_0$. When comparing their sequences among the eight *S. cerevisiae* strains, we did not observe any significant difference in average number of SNPs, measures of strength of purifying selection, or propensity for disruptive mutations. $ORFs_0^+$ exhibited significantly shorter length distribution than $ORFs_0$ according to a Kolmogorov-Smirnov test ($P < 2.2 \times 10^{-16}$) as well as a slightly but significantly higher codon adaptation index. The amino acid composition of $ORFs_0^+$ did not appear to fall between that of other $ORFs_0$ and of $ORFs_{1\text{-}4}$, although the amino acid composition of $ORFs_{1\text{-}4}$ did tend to fall between that of $ORFs_0^+$ and of $ORFs_{5\text{-}10}$. $ORFs_0^+$ were strikingly lysine-rich relative to other $ORFs_0$ and to $ORFs_{1\text{-}10}$. Hence, $ORFs_0^+$ are not a random sample of $ORFs_0$, and likely have a cellular role in addition to their evolutionary potential.

Sequence properties related to translation

The TMHMM[46] program was used to predict putative transmembrane regions. The DISOPRED2[47] program was used to predict disordered regions after

removing predicted transmembrane regions and coiled coil regions predicted with COILS[48], as previously described[49]. The general average hydropathicity (or GRAVY score) was calculated as the arithmetic mean of the sum of the hydropathic indices of each amino acid[50], as provided by SGD[16]. Codon adaptation index was evaluated using the original methodology[51]. To assess the AUG context optimality, we considered the presence or absence of an adenine in position -3 relative to the AUG start codon[52].

Supplementary Methods 2: Integration with external datasets

RNA abundance

Transcription levels of *S. cerevisiae* ORFs were estimated from three published genome-wide datasets, which used two distinct strand-specific experimental techniques: oligo-tiling array[53], and RNAseq[17,25]. In the oligo-tiling array dataset, the normalized intensity of expression per probe was averaged, and the percentage of probes within an ORF_{1-10} with intensity higher than this average was defined as the expression level of this ORF_{1-10}. Estimations of expression level by RNAseq[17] (Supplementary Fig. 5) were not reprocessed. For RNAseq[25] (Fig. 2a), estimations of expression level correspond to the number of sequencing reads from the transcriptome experiment in rich conditions which map to each ORF (next subsection), normalized by the length of the ORF in nucleotides.

Ribosome footprinting

Our evolutionary model predicts that a subset of $ORFs_0$ should be translated. Given i) the size, ii) the biased amino acid composition, iii) the differential translation and iv) the unannotated status of $ORFs_0$, proteomics identification of the corresponding peptides is not feasible without considerably adapting state-of-the-art technologies to our particular goal, both in terms of experimental set-up and of computational analysis (N. Kulak and M. Mann, personal communication). We thus searched instead for signatures of translation in a ribosome footprinting dataset[25].

Sequencing reads alignment

Raw reads from ribosome footprinting experiments[25] were downloaded from the Short Read Archive maintained by NCBI[54], stored with accession number SRA008252. The initial analysis[25] discarded the reads mapping to dubious ORFs and other overlapping features, but these reads were necessary for our purposes. Therefore, all the sequencing reads were re-mapped to the reference genome with the Bowtie short read mapping program[55] using the first 25 nucleotides as the 'seed' region. Reads with multiple matches to the reference genome were discarded. To maximize the matched reads, reads that had failed to map with no mismatches in the seed region were fed again into Bowtie, allowing one mismatch in the seed region, and those that still failed to align were mapped with two mismatches in the seed region. In total 85-95% of the reads could be aligned to the reference genome. Short read runs were subsequently

grouped into four categories: ribosome footprinting in rich conditions (eight runs), ribosome footprinting in amino acid starvation conditions (six runs), and corresponding RNAseq runs (rich, four runs and starvation, three runs). All the runs in each group were merged to create a single mapping file (Supplementary Fig. 6).

Detection of translation signatures

The mapping of footprint reads to $ORFs_0$ does not necessarily indicate full-length, ORF-specific translation[6,25]. For example, stop codon read-through may produce footprint reads that fully cover an ORF_0 despite being associated with a nearby ORF_{10} (Supplementary Fig. 6).

To detect unequivocal translation signatures in $ORFs_0$, we developed a bioinformatics pipeline optimizing three parameters with regards to two null models for the observation of footprint reads that map to $ORFs_0$. The three parameters we took into account are:

- P, a minimum proportion of ORF length covered in RNA and footprint reads

- T, a minimum factor by which the number of footprint reads per nucleotide in the ORF is strictly higher than the number of footprint reads per nucleotide in the surrounding up- and downstream windows

- W, the size of the windows in nucleotides

Any two $ORFs_0$ that partially overlap on the same strand and show translation signatures in the same experimental conditions were both eliminated from the set of $ORFs_0$ considered to show translation signatures.

We considered the following two null models:

- Null model 1: the detected presence of ribosomes on non-genic sequences is not related to the presence of $ORFs_0$ (the ribosome binds the corresponding transcript for a biological purpose which is not to translate $ORFs_0$)

- Null model 2: the ribosome footprinting assay suffers from technical artifacts, and footprint reads observed outside of annotated ORFs are non-specific.

We compared the observed number of $ORFs_0$ showing translation signatures to the number of $ORFs_0$ expected to show translation signatures under each of the two null models when translation signatures are defined by any of 168 combinations of the three parameters:

- P : (0.1, 0.5, 0.8, 1)

- T : (1, 1.5, 2, 3, 4, 5)

- W : (10, 20, 30, 50, 100, 200, 300)

To evaluate the number of $ORFs_0$ expected to show translation signatures under null model 1, we randomized the positions of $ORFs_0$ throughout non-genic sequences while maintaining the length distribution of $ORFs_0$ and the observed

positions of RNA and footprint reads. To evaluate the number of $ORFs_0$ expected to show translation signatures under null model 2, we randomized the positions of footprint reads throughout non-genic sequences while maintaining the length distribution of footprint reads, the positions of RNA reads and the positions of $ORFs_0$. We performed 20 simulations per null model per parameter set, and 80 additional simulations per null model for the parameter set shown in Fig. 3b, *i.e.* 6,880 genome-wide simulations. The corresponding algorithms are available upon request.

For 165 of the 168 tested parameter sets, the observed number of $ORFs_0$ showing signatures of translation was significantly higher than expected under null model 1, hence rejecting null model 1 ($P < 0.05$). The three parameter sets that did not pass this test were [P = 1, T = 4, W = 10], [P = 1, T = 5, W = 10] and [P = 1, T = 1, W = 300]. With every other parameter set, the presence of ribosomes on non-genic sequences appeared undoubtedly related to the presence of $ORFs_0$. Null model 2 was rejected for 94 of the 168 tested parameter sets ($P < 0.05$). In total, null model 1 and null model 2 were both rejected by 91 parameter sets.

For each of these 91 parameter sets, we estimated signal-to-noise ratio S = (O-E)/O, where O represents the number of $ORFs_0$ with translation signatures observed in the data and E represents the number of $ORFs_0$ with translation signatures expected under null model 2. The parameter set [P = 0.1, T = 5, W = 300] showed the best sensitivity (O = 3,069) for a high signal-to-noise ratio (S = 71% ± 1%, average and standard deviation; Supplementary Fig. 6).

However, the footprint reads were concentrated on a small fraction of the length of many of the $ORFs_0$ showing signatures of translation according to this set of parameters, for example on the start codon (Supplementary Fig. 6). While this signal appears highly specific based on signal-to-noise ratio, it could reflect a ribosomal activity other than full ORF translation. We therefore chose to impose a larger P parameter, reducing sensitivity but enriching for full ORF translation events. The set of parameters used in the analyses presented in the manuscript is [P = 0.5, T = 5, W = 300], detecting 1,139 $ORFs_0$ with signatures of translation ($ORFs_0^+$) at a signal-to-noise ratio of 67% ± 2% (average and standard deviation) (Fig. 3b, Supplementary Fig. 6 and Supplementary Table 3). Most $ORFs_0^+$ correspond to independent translation events (Fig. 3a and b), although 11 appear located on the leader transcripts of $ORFs_{1\text{-}10}$ and 6 are organized in adjacent groups that might indicate polycistronic transcripts.

Empirical observations indicated that the parameters T and W are not relevant for annotated ORFs, where instances of stop codon read-through would result in many false negatives (Supplementary Fig. 6). With [P = 0.5] the only parameter to detect signatures of translation for $ORFs_{1\text{-}10}$, we find 117 $ORFs_{1\text{-}4}$ and 4,545 $ORFs_{5\text{-}10}$ with signatures of translation (Supplementary Fig. 6).

The finding that $ORFs_0$ and $ORFs_{1\text{-}4}$ are translated in a condition-specific manner relative to $ORFs_{5\text{-}10}$ (Fig. 3d) was robust to parameter choice (Supplementary Fig. 6).

Overlap with meiosis translation units

A recent ribosome profiling study[19] identified transcripts containing start codons associated with ribosomes during meiosis ("meiosis translation units") in the distant *S. cerevisiae* strain SK1. Of the 83,383 $ORFs_0$ for which we found a one-to-one orthologue in SK1, 1,353 were identified as meiosis translation units[19] and 795 as $ORFs_0^+$ (this study), with an overlap of 150 (Fisher's exact test: $P < 2.2 \times 10^{-16}$, Odds Ratio = 15.7). This observation confirms the rejection of null model 2, both for this study and for the meiosis study[19], unless the ribosome profiling assay produces systematic false positives that have not yet been identified.

Gene Ontology

The Gene Ontology (GO) Directed Acyclic Graph (DAG), and also the associations between individual annotated ORFs and GO terms, were obtained directly from the GO Annotation database[56] at http://www.geneontology.org/ in June 2011. These attributes were "up-propagated", *i.e*. if an ORF was annotated as having a given attribute A, the ORF was also associated with all attributes implied by attribute A (namely its parents in the GO DAG). GO annotations were excluded from the analysis if they were inferred from non-traceable author statements, or if they were of unknown origin ('NAS' and 'ND' evidence codes respectively). Only 56 of the 777 $ORFs_{1\text{-}4}$ had available GO annotations in the biological process branch. Yet 13 of these were assigned the term "response to stress", which represents a two-fold enrichment in relation to GO-annotated $ORFs_{5\text{-}10}$ ($P < 0.05$, one-sided Fisher's exact test) (Supplementary Table 2).

Transcription factor binding sites

Regulatory annotations[57] were downloaded from SGD in January 2012. We extracted the transcription factor binding sites and mapped the associated transcription factor gene names to our version of the SGD $ORF_{1\text{-}10}$ names.

Supplementary Methods 3: Statistical analyses

All statistical tests were performed with R software[58]. Kendall's statistics were applied to quantify correlations presented in this manuscript. For correlations between conservation level and any variable reported in the main figures of the manuscript, we verified that the correlation is always significant i) when only $ORFs_{5\text{-}10}$ are taken into account and ii) when only 50 ORFs of each conservation level are sampled (100 bootstrap simulations per correlation statistics) (Supplementary Table 4).

To verify that the correlation between conservation level and strength of purifying selection was not entirely driven by RNA expression levels, we measured the corresponding partial correlations and showed that these were non-zero using a previously developed methodology[59] (expression level measured with RNAseq[25] in rich conditions, in terms of number of reads per nucleotide: Kendall's *tau* = 0.3, $P = 1.8 \times 10^{-241}$; expression level measured with RNAseq[17]: Kendall's *tau* = 0.3, $P = 6.86 \times 10^{-157}$; expression level measured by oligo-tiling array[53]: Kendall's *tau* = 0.3, $P = 8.45 \times 10^{-230}$). The same methodology

was applied to verify that the correlation between conservation level and strength of purifying selection was not an artifact of limitations of the dN/dS method when applied to short sequences (Kendall's *tau* = 0.2, $P = 2.04 \times 10^{-103}$). Finally, we verified that the correlation between conservation level and $ORFs_{1\text{-}10}$ length was not an artefact of applying the BLAST programs to shorter sequences, by reproducing a significant correlation when limiting our observations to $ORFs_{1\text{-}10}$ with BLAST hits covering at least 80% of their length (Kendall's *tau* = 0.2, $P < 2.2 \times 10^{-16}$).

Supplementary Tables

TF symbol	TF name	Number of candidate proto-genes among targets	Total number of targets	SGD description of the TF
YHR206W	*SKN7*	8	16	Nuclear response regulator and transcription factor; physically interacts with the Tup1-Cyc8 complex and recruits Tup1p to its targets; part of a branched two-component signaling system; required for optimal induction of heat-shock genes in response to oxidative stress; involved in osmoregulation.
YER111C	*SWI4*	9	16	DNA binding component of the SBF complex (Swi4p-Swi6p), a transcriptional activator that in concert with MBF (Mbp1-Swi6p) regulates late G1-specific transcription of targets including cyclins and genes required for DNA synthesis and repair. SWItching deficient.
YLR403W	*SFP1*	4	6	Transcription factor that controls expression of ribosome biogenesis genes in response to nutrients and stress, regulates G2/M transitions during mitotic cell cycle and DNA-damage response, modulates cell size; regulated by TORC1 and Mrs6p; can form the [ISP+] prion.
YMR016C	*SOK2*	10	15	Nuclear protein that plays a regulatory role in the cyclic AMP (cAMP)-dependent protein kinase (PKA) signal transduction pathway; negatively regulates pseudohyphal differentiation; homologous to several transcription factors.

Supplementary Table 1. Transcription factors (TFs) predicted to preferentially regulate the expression of candidate proto-genes. The predicted targets of TFs that are listed in this table are statistically enriched in candidate proto-genes ($ORFs_0^+$ and $ORFs_{1\text{-}4}$) according to hypergeometric tests ($P < 0.05$).

ORF name	Gene name	Quality	Age	Description	NULL mutant phenotypes (SGD curation)
YBR278W	*DPB3*	Verified	4	Third-largest subunit of DNA polymerase II (DNA polymerase epsilon), required to maintain fidelity of chromosomal replication and also for inheritance of telomeric silencing; mRNA abundance peaks at the G1/S boundary of the cell cycle	Chromosome/plasmid maintenance: abnormal; resistance to 4-aminofolic acid and sulfanilamide: decreased; silencing: decreased; cell size: increased; competitive fitness: decreased; dessication resistance: decreased; resistance to rapamycin: decreased; resistance to arsenite(3-): decreased; resistance to wortmannin: decreased; viable
YDR014W-A	*HED-1*	Verified	4	Meiosis-specific protein that down-regulates Rad51p-mediated mitotic recombination when the meiotic recombination machinery is impaired; early meiotic gene, transcribed specifically during meiotic prophase	N/A
YER014C-A	*BUD25*	Verified	4	Protein involved in bud-site selection; diploid mutants display a random budding pattern instead of the wild-type bipolar pattern	Acid pH resistance: decreased; alkaline pH resistance: decreased; budding pattern: abnormal; cell size: decreased; glycogen accumulation: decreased; competitive fitness: decreased; heat sensitivity: increased; lipid particle morphology: abnormal; metal resistance: decreased; resistance to cycloheximide: decreased; resistance to methyl methanesulfonate: decreased; resistance to CTBT: decreased; resistance to arsenite(3-): decreased; resistance to camptothecin: decreased; resistance to doxorubicin: decreased; resistance to L-1,4-dithiothreitol: decreased; resistance to acetic acid: decreased; resistance to wortmannin: decreased; resistance to sulfometuron methyl: decreased; resistance to rapamycin: decreased; resistance to caffeine: decreased; resistance to hydroxyurea: decreased; respiratory growth: absent; toxin resistance: decreased; transposable element transposition: decreased; utilization of nitrogen source: absent
YFR026C	*ULI1*	Verified	3	Involved in and induced by the endoplasmic reticulum unfolded protein response	Competitive fitness: decreased; sporulation: normal; viable
YJL144W	N/A	Verified	4	Cytoplasmic hydrophilin with a role in dessication resistance; expression induced by osmotic stress, starvation and during stationary phase; GFP-fusion protein is induced by the DNA-damaging agent MMS	Dessication resistance: decreased; competitive fitness: increased; dessication resistance: decreased; resistance to cycloheximide: decreased; resistance to amitrole: decreased; viable
YLR265C	*NEJ1*	Verified	4	Protein involved in regulation of nonhomologous end joining; interacts with DNA ligase IV components Dnl4p and Lif1p; repressed by MAT heterozygosity; regulates cellular distribution of Lif1p	Resistance to phleomycin: increased; competitive fitness: increased; resistance to acrolein: decreased; sporulation: normal; viable
YML058W-A	*HUG1*	Verified	4	Protein involved in the Mec1p-mediated checkpoint pathway that responds to DNA damage or replication arrest, transcription is induced by DNA damage	Heat sensitivity: decreased; pseudohyphal growth: decreased; resistance to hydroxyurea: decreased

YMR159C	*ATG16*	Verified	4	Conserved protein that interacts with Atg12p-Atg5p conjugates to form Atg12p-Atg5p-Atg16p multimers, which localize to the pre-autophagosomal structure and are required for autophagy	Autophagy: absent; metal resistance: increased; mitophagy: decreased; GFP-Osh1p accumulation: increased; Atg8p distribution: abnormal; Atg5p distribution: abnormal; Lap4p (API) modification: absent; sporulation: absent; viability: decreased
YMR175W	*SIP18*	Verified	4	Phospholipid-binding hydrophilin with a role in dessication resistance; expression is induced by osmotic stress	Dessication resistance: decreased; toxin resistance: decreased; competitive fitness: increased; toxin resistance: decreased; viable
YMR251W-A	*HOR7*	Verified	4	Protein of unknown function; overexpression suppresses Ca2+ sensitivity of mutants lacking inositol phosphorylceramide mannosyltransferases Csg1p and Csh1p; transcription is induced under hyperosmotic stress and repressed by alpha factor	Competitive fitness: decreased; viable
YNR074C	*AIF1*	Verified	4	Mitochondrial cell death effector that translocates to the nucleus in response to apoptotic stimuli, homolog of mammalian Apoptosis-Inducing Factor, putative reductase	Apoptosis: absent; apoptosis: decreased; reactive oxygen species accumulation: decreased; metal resistance: decreased; oxidative stress resistance: increased; resistance to dihydromotuporamine C: decreased; toxin resistance: increased; viable
YOL052C-A	*DDR2*	Verified	4	Multistress response protein, expression is activated by a variety of xenobiotic agents and environmental or physiological stresses	Survival rate in stationary phase: decreased;; polyphosphate accumulation: abnormal; competitive fitness: increased; mitotic recombination: increased; Rad52-YFP distribution: increased
YPL223C	*GRE1*	Verified	4	Hydrophilin of unknown function; stress induced (osmotic, ionic, oxidative, heat shock and heavy metals); regulated by the HOG pathway	Competitive fitness: increased

Supplementary Table 2. Description of 13 ORFs$_{1-4}$ annotated with the Gene Ontology term "response to stress". Source: SGD[17].

ORF name	Conservation level	Retained by natural selection	Length greater or equal to 300 nucleotides	With translation signatures	Chromosome	Coor1	Coor2	Strand
YAL068W-A	4	0	0	0	1	538	792	+
smorf38	0	0	0	1	1	9547	9618	+
YAL064W	2	0	1	0	1	21526	21852	+
YAL031W-A	1	0	1	0	1	84670	84978	+
smorf708	0	0	0	1	1	198892	198963	+
YAR064W	3	0	1	0	1	220189	220488	+
YAL069W	1	0	1	0	1	335	649	+
YAL067W-A	4	1	0	0	1	2480	2707	+
smorf1076	0	0	0	1	1	73913	73954	+
YAL019W-A	4	0	1	0	1	114251	114820	+
smorf1290	0	0	0	1	1	138614	138652	+
YAR053W	1	0	0	0	1	208358	208654	+
YAL066W	1	0	1	0	1	10092	10400	+
smorf1697	0	0	0	1	1	11403	11441	+
YAL047W-A	3	1	1	0	1	54585	54914	+
YAR019W-A	3	0	1	0	1	174996	175340	+
smorf2407	0	0	0	1	1	196554	196589	+
smorf2421	0	0	0	1	1	200664	200696	+
YAR066W	4	0	1	0	1	221040	221651	+
smorf2495	0	0	0	1	1	225063	225110	+
YAR070C	4	0	1	0	1	224554	224853	-
YAR069C	4	0	0	0	1	224002	224295	-
YAR047C	2	0	1	0	1	201460	201780	-
YAR035C-A	1	0	0	0	1	192331	192411	-
smorf2748	0	0	0	1	1	176551	176592	-
YAL016C-A	4	0	1	0	1	124756	125070	-
smorf3203	0	0	0	1	1	42817	42882	-
smorf3239	0	0	0	1	1	34159	34194	-
smorf3472	0	0	0	1	1	199878	199934	-
YAL016C-B	2	0	0	0	1	124308	124493	-
smorf3869	0	0	0	1	1	82431	82502	-
YAL056C-A	1	0	1	0	1	38697	39047	-
YAR060C	3	0	1	0	1	217148	217483	-
YAR030C	1	0	1	0	1	186506	186847	-
YAL026C-A	4	0	1	0	1	95387	95824	-
YAL034C-B	4	0	1	0	1	79490	79843	-
YAL037C-A	1	0	0	0	1	73427	73519	-
YAL042C-A	2	0	1	0	1	61232	61609	-
smorf4839	0	0	0	1	1	33458	33499	-
smorf4840	0	0	0	1	1	33380	33433	-
smorf4885	0	0	0	1	1	23213	23260	-
YAL063C-A	2	0	0	0	1	22397	22687	-
smorf5363	0	0	0	1	2	115822	115863	+
YBL053W	1	0	1	0	2	119338	119712	+
smorf5778	0	0	0	1	2	238570	238623	+
smorf5835	0	0	0	1	2	252217	252258	+
YBR032W	3	1	1	0	2	301519	301821	+
smorf6145	0	0	0	1	2	336517	336558	+
YBR056W-A	4	1	0	1	2	351253	351453	+
smorf6264	0	0	0	1	2	366817	366918	+
smorf6276	0	0	0	1	2	370627	370686	+
smorf6277	0	0	0	1	2	370690	370782	+
smorf6281	0	0	0	1	2	372058	372105	+
smorf6442	0	0	0	1	2	418516	418551	+
YBR178W	4	0	1	0	2	586066	586440	+
YBR184W	4	0	1	0	2	597358	598929	+
YBR191W-A	4	0	0	1	2	607144	607218	+
YBR200W-A	1	0	0	0	2	622978	623142	+
YBR224W	4	0	1	0	2	670120	670635	+
smorf7747	0	0	0	1	2	786676	786708	+
YBL108W	4	0	1	0	2	8177	8482	+
YBL100W-C	3	0	0	1	2	28427	28546	+
smorf8088	0	0	0	1	2	60644	60679	+
YBL073W	3	0	1	0	2	87644	87955	+
YBL065W	4	0	1	0	2	99965	100309	+
YBL044W	4	0	1	0	2	136001	136369	+
smorf8481	0	0	0	1	2	164531	164677	+
smorf8862	0	0	0	1	2	276839	276931	+
smorf8907	0	0	0	1	2	291131	291169	+
smorf9121	0	0	0	1	2	350186	350275	+

smorf9142	0	0	0	1	2	353519	353587	+
smorf9187	0	0	0	1	2	364409	364468	+
smorf9210	0	0	0	1	2	370010	370045	+
YBR113W	4	0	1	0	2	465560	466042	+
smorf9630	0	0	0	1	2	474254	474355	+
YBR126W-A	3	0	0	1	2	490844	491050	+
smorf9824	0	0	0	1	2	527666	527719	+
smorf9833	0	0	0	1	2	532499	532531	+
YBR209W	4	0	1	0	2	642578	642895	+
YBR221W-A	4	0	0	0	2	666533	666637	+
smorf10453	0	0	0	1	2	716846	716890	+
smorf10670	0	0	0	1	2	773675	773731	+
YBR285W	4	0	1	1	2	773918	774352	+
YBL077W	3	0	1	0	2	80895	81326	+
YBL048W	4	0	1	0	2	127302	127613	+
smorf11354	0	0	0	1	2	151725	151769	+
YBL008W-A	4	0	0	0	2	209412	209651	+
smorf11717	0	0	0	1	2	251808	251879	+
smorf11880	0	0	0	1	2	292071	292172	+
YBR051W	2	0	1	0	2	337986	338336	+
smorf12139	0	0	0	1	2	362898	362939	+
smorf12183	0	0	0	1	2	373212	373244	+
YBR124W	2	0	1	0	2	486501	486860	+
YBR134W	3	0	1	0	2	504237	504638	+
YBR148W	4	1	1	0	2	537870	539699	+
smorf12902	0	0	0	1	2	582015	582071	+
YBR190W	4	0	1	0	2	605961	606272	+
YBR206W	2	0	1	1	2	634596	634919	+
smorf13232	0	0	0	1	2	675006	675065	+
smorf13648	0	0	0	1	2	785439	785498	+
smorf13665	0	0	0	1	2	788439	788540	+
smorf13805	0	0	0	1	2	804794	804907	-
YBR296C-A	1	0	0	0	2	800117	800236	-
YBR277C	2	1	1	0	2	760211	760612	-
smorf14074	0	0	0	1	2	722423	722497	-
smorf14319	0	0	0	1	2	644897	644944	-
smorf14445	0	0	0	1	2	607202	607246	-
smorf14488	0	0	0	1	2	597044	597085	-
smorf15107	0	1	0	1	2	431240	431278	-
smorf15282	0	0	0	1	2	386027	386071	-
YBR063C	4	0	1	0	2	366968	368182	-
smorf15429	0	0	0	1	2	349694	349729	-
YBR050C	4	0	1	0	2	337181	338197	-
smorf15591	0	0	0	1	2	303728	303772	-
YBR013C	4	0	1	1	2	265490	265879	-
smorf15763	0	0	0	1	2	251564	251623	-
smorf16023	0	0	0	1	2	169637	169873	-
YBL071C	2	0	1	0	2	90221	90529	-
YBL071C-B	3	0	0	0	2	89456	89554	-
YBL100C	1	0	1	0	2	36986	37300	-
YBR300C	3	0	1	0	2	808594	809091	-
YBR232C	1	1	1	0	2	683368	683727	-
YBR226C	2	0	1	0	2	673150	673560	-
smorf17112	0	0	0	1	2	650119	650172	-
YBR196C-B	1	0	0	0	2	614521	614625	-
smorf17456	0	0	0	1	2	558337	558438	-
smorf17494	0	1	0	1	2	546031	546213	-
smorf17506	0	0	0	1	2	540529	540588	-
smorf17535	0	0	0	1	2	532924	532968	-
smorf17702	0	0	0	1	2	479665	479715	-
YBR116C	1	0	1	0	2	474193	474720	-
YBR107C	4	0	1	0	2	453787	454524	-
smorf17832	0	0	0	1	2	452404	452448	-
YBR103C-A	4	1	0	0	2	449314	449457	-
smorf17931	0	0	0	1	2	417955	417999	-
YBR076C-A	1	0	0	1	2	391345	391611	-
YBR072C-A	1	0	0	0	2	382855	383016	-
smorf18388	0	0	0	1	2	283429	283491	-
smorf18409	0	0	0	1	2	275542	275589	-
smorf18840	0	0	0	1	2	171097	171144	-
smorf18874	0	0	0	1	2	161428	161469	-
smorf19172	0	0	0	1	2	92077	92145	-
smorf19187	0	0	0	1	2	88348	88515	-

smorf19266	0	0	0	1	2	75088	75132	-
YBL096C	2	0	1	0	2	43171	43479	-
YBR298C-A	2	0	0	0	2	805029	805250	-
smorf19629	0	0	0	1	2	786627	786713	-
YBR292C	2	0	1	0	2	784698	785069	-
smorf19997	0	0	0	1	2	700161	700202	-
smorf20256	0	1	0	1	2	629613	629699	-
YBR201C-A	4	0	0	1	2	624489	624692	-
YBR196C-A	3	0	0	0	2	614019	614168	-
YBR182C-A	1	0	0	0	2	595356	595550	-
YBR174C	1	0	1	0	2	582333	582647	-
smorf20500	0	0	0	1	2	556470	556511	-
YBR144C	3	0	1	0	2	533229	533543	-
smorf20911	0	0	0	1	2	417123	417161	-
smorf21307	0	0	0	1	2	307626	307688	-
YBR027C	4	0	1	0	2	294024	294356	-
YBL012C	2	0	1	0	2	203409	203810	-
smorf21894	0	0	0	1	2	166851	166904	-
smorf21949	0	0	0	1	2	146271	146306	-
YBL070C	4	0	1	0	2	90603	90923	-
smorf22501	0	0	0	1	3	8554	8604	+
smorf22585	0	0	0	1	3	30910	30996	+
smorf22633	0	0	0	1	3	40969	41055	+
YCL042W	3	0	1	1	3	50584	50943	+
smorf22736	0	0	0	1	3	69034	69078	+
YCL021W-A	4	0	1	0	3	83620	83997	+
smorf22795	0	0	0	1	3	92710	92769	+
smorf22866	0	0	0	1	3	114388	114441	+
smorf22873	0	0	0	1	3	116383	116427	+
smorf22887	0	0	0	1	3	120841	120873	+
smorf22980	0	0	0	1	3	152035	152121	+
smorf23005	0	0	0	1	3	156436	156492	+
smorf23027	0	0	0	1	3	160732	160773	+
smorf23173	0	0	0	1	3	205903	205944	+
smorf23188	0	0	0	1	3	209707	209832	+
smorf23284	0	0	0	1	3	242629	242685	+
smorf23372	0	0	0	1	3	273913	273963	+
YCR095W-A	1	0	0	0	3	289636	289794	+
YCR097W-A	4	0	0	0	3	294436	294702	+
smorf23466	0	0	0	1	3	303259	303339	+
YCL065W	4	0	1	0	3	13751	14119	+
smorf23637	0	0	0	1	3	39662	39805	+
YCL046W	1	1	1	0	3	46640	46963	+
smorf23901	0	0	0	1	3	114878	114916	+
smorf23995	0	0	0	1	3	142619	142687	+
YCR085W	3	0	1	0	3	262913	263266	+
smorf24539	0	0	0	1	3	289496	289588	+
YCL076W	4	0	1	0	3	1392	2135	+
smorf24784	0	0	0	1	3	44526	44585	+
smorf25041	0	0	0	1	3	111546	111587	+
YCR001W	2	0	1	0	3	115683	115997	+
smorf25077	0	0	0	1	3	120519	120560	+
smorf25256	0	0	0	1	3	169158	169193	+
smorf25259	0	0	0	1	3	169500	169553	+
YCR041W	4	0	1	0	3	200907	201239	+
smorf25550	0	0	0	1	3	243246	243287	+
smorf25734	0	0	0	1	3	300054	300113	+
YCR108C	1	0	0	0	3	315994	316185	-
YCR064C	3	0	1	0	3	228091	228501	-
YCR049C	2	0	1	0	3	211867	212313	-
smorf26395	0	0	0	1	3	170305	170367	-
YCR024C-B	4	0	0	1	3	162595	162861	-
YCR022C	4	0	1	0	3	157417	157761	-
smorf26463	0	0	0	1	3	152509	152571	-
YCR013C	2	0	1	0	3	138400	139047	-
smorf26594	0	0	0	1	3	116605	116649	-
YCL023C	3	0	1	0	3	78949	79296	-
smorf26892	0	0	0	1	3	28330	28392	-
smorf26954	0	0	0	1	3	8347	8382	-
smorf27026	0	0	0	1	3	309747	309884	-
smorf27536	0	0	0	1	3	185904	185990	-
smorf27568	0	0	0	1	3	176808	176852	-
smorf27667	0	0	0	1	3	152001	152048	-

smorf27744	0	0	0	1	3	124428	124466	-
YCL007C	2	0	1	0	3	106974	107366	-
smorf27904	0	0	0	1	3	82554	82592	-
YCL041C	3	0	1	1	3	50133	50627	-
smorf28057	0	0	0	1	3	39414	39455	-
YCL056C	4	0	1	1	3	26925	27359	-
YCL058C	2	0	1	0	3	23523	23981	-
smorf28492	0	0	0	1	3	225968	226003	-
YCR025C	4	0	1	0	3	163442	163852	-
smorf28850	0	0	0	1	3	124859	124933	-
YCR006C	4	0	1	0	3	122528	123001	-
smorf29045	0	0	0	1	3	75437	75478	-
YDL241W	4	0	1	1	4	20635	21006	+
smorf29417	0	0	0	1	4	21424	21462	+
smorf29472	0	0	0	1	4	35566	35622	+
YDL186W	4	0	1	0	4	125617	126450	+
YDL159W-A	4	0	0	0	4	172183	172314	+
smorf30148	0	0	0	1	4	221101	221145	+
YDL114W-A	4	0	0	0	4	254935	255048	+
smorf30472	0	0	0	1	4	320443	320475	+
smorf30675	0	0	0	1	4	378757	378804	+
smorf30681	0	0	0	1	4	381796	381849	+
YDL034W	1	0	1	0	4	391780	392124	+
YDL026W	2	0	1	0	4	404746	405057	+
smorf30749	0	0	0	1	4	405241	405288	+
YDR024W	3	0	1	0	4	491014	491499	+
YDR029W	4	0	1	0	4	501097	501411	+
YDR034W-B	4	0	0	1	4	521311	521466	+
smorf31254	0	0	0	1	4	551023	551109	+
smorf31285	0	0	0	1	4	561031	561066	+
smorf31385	0	0	0	1	4	588046	588099	+
smorf31518	0	0	0	1	4	626305	626388	+
smorf32317	0	0	0	1	4	832612	832647	+
YDR194W-A	2	0	0	0	4	848068	848220	+
smorf32567	0	0	0	1	4	899257	899310	+
YDR246W-A	3	0	0	0	4	955129	955329	+
smorf32877	0	0	0	1	4	979834	979866	+
YDR290W	4	0	1	0	4	1039366	1039695	+
smorf33192	0	0	0	1	4	1052503	1052541	+
smorf33239	0	0	0	1	4	1072279	1072320	+
smorf33849	0	0	0	1	4	1242739	1242771	+
YDR406W-A	2	0	0	0	4	1283791	1284036	+
smorf34291	0	0	0	1	4	1366099	1366140	+
smorf34604	0	0	0	1	4	1454983	1455027	+
YDR525W	4	0	1	0	4	1489897	1490226	+
smorf34763	0	0	0	1	4	1501045	1501080	+
smorf34796	0	0	0	1	4	1510018	1510050	+
YDL242W	4	0	1	0	4	18959	19312	+
smorf34989	0	0	0	1	4	26360	26422	+
smorf35065	0	0	0	1	4	50582	50617	+
YDL221W	4	0	1	0	4	62012	62563	+
smorf36039	0	1	0	1	4	316643	316699	+
smorf36061	0	0	0	1	4	323936	324040	+
YDL062W	1	0	1	0	4	339857	340282	+
smorf36384	0	0	0	1	4	417272	417304	+
YDR014W-A	4	0	1	0	4	477794	478282	+
smorf36872	0	0	0	1	4	542549	542803	+
smorf37192	0	0	0	1	4	617966	618121	+
smorf37216	0	0	0	1	4	628637	628696	+
YDR112W	2	1	1	0	4	679541	679849	+
smorf37503	0	0	0	1	4	699920	700096	+
smorf37593	0	0	0	1	4	720620	720661	+
smorf37601	0	0	0	1	4	722384	722455	+
smorf37678	0	0	0	1	4	743513	743590	+
YDR157W	4	0	1	0	4	769928	770329	+
YDR230W	1	0	1	0	4	926219	926566	+
smorf38356	0	0	0	1	4	968162	968200	+
smorf38518	0	0	0	1	4	1015976	1016020	+
smorf38566	0	0	0	1	4	1030514	1030597	+
smorf38569	0	0	0	1	4	1031219	1031251	+
smorf38808	0	0	0	1	4	1090094	1090150	+
YDR320W-B	4	0	0	0	4	1108481	1108618	+
smorf39073	0	0	0	1	4	1154054	1154182	+

smorf39232	0	0	0	1	4	1195913	1195957	+
YDR396W	3	0	1	0	4	1266287	1266787	+
smorf39498	0	0	0	1	4	1288124	1288183	+
smorf39847	0	0	0	1	4	1406126	1406221	+
YDR521W	1	0	1	0	4	1483133	1483468	+
smorf40276	0	0	0	1	4	1516604	1516672	+
smorf40298	0	0	0	1	4	1521236	1521295	+
YDL247W-A	4	0	0	0	4	3762	3836	+
smorf40392	0	0	0	1	4	19428	19475	+
smorf40397	0	0	0	1	4	21450	21545	+
smorf40511	0	0	0	1	4	49998	50054	+
smorf40513	0	0	0	1	4	50346	50498	+
smorf40531	0	0	0	1	4	59463	59522	+
smorf40605	0	0	0	1	4	81486	81524	+
smorf40642	0	0	0	1	4	94134	94286	+
YDL152W	3	0	1	0	4	182823	183188	+
smorf41057	0	0	0	1	4	219600	219641	+
YDL118W	2	0	1	0	4	247302	247682	+
smorf41595	0	0	0	1	4	359784	359828	+
smorf41608	0	0	0	1	4	361959	361994	+
YDL032W	2	0	1	0	4	393687	393998	+
smorf41832	0	0	0	1	4	408153	408197	+
YDR003W-A	2	0	0	1	4	454779	454901	+
smorf42031	0	0	0	1	4	471072	471173	+
smorf42189	0	0	0	1	4	512568	512600	+
smorf42335	0	0	0	1	4	545511	545549	+
smorf42433	0	0	0	1	4	569451	569549	+
smorf42437	0	0	0	1	4	570096	570146	+
smorf42704	0	0	0	1	4	645078	645116	+
smorf42836	0	0	0	1	4	683745	683810	+
YDR118W-A	1	0	0	0	4	687765	687881	+
smorf42952	0	0	0	1	4	723048	723119	+
smorf43305	0	0	0	1	4	831891	831941	+
YDR193W	1	0	1	0	4	844551	844949	+
YDR199W	2	0	1	0	4	854172	854537	+
YDR203W	1	0	1	0	4	857679	857996	+
smorf43397	0	0	0	1	4	861804	861848	+
YDR241W	3	0	0	0	4	945147	945434	+
YDR275W	4	0	1	1	4	1012248	1012955	+
smorf43997	0	0	0	1	4	1022082	1022126	+
smorf44227	0	0	0	1	4	1080807	1080848	+
YDR327W	1	0	1	0	4	1125297	1125623	+
YDR360W	1	0	1	0	4	1194591	1194977	+
smorf45094	0	0	0	1	4	1301022	1301078	+
YDR431W	2	0	1	0	4	1328382	1328693	+
smorf45316	0	0	0	1	4	1366614	1366670	+
smorf45649	0	0	0	1	4	1466223	1466282	+
YDR509W	2	0	1	0	4	1468218	1468565	+
YDR524W-C	4	0	0	0	4	1489395	1489484	+
smorf45967	0	0	0	1	4	1514879	1514941	-
smorf46055	0	0	0	1	4	1493810	1493902	-
YDR510C-A	2	0	0	0	4	1469687	1469803	-
smorf46506	0	0	0	1	4	1388801	1388848	-
smorf46712	0	0	0	1	4	1336931	1336981	-
smorf47006	0	0	0	1	4	1261289	1261345	-
smorf47342	0	0	0	1	4	1159202	1159249	-
YDR281C	4	0	1	1	4	1022003	1022317	-
smorf47869	0	0	0	1	4	980738	980773	-
smorf48110	0	0	0	1	4	911234	911290	-
YDR187C	1	0	1	0	4	836225	836743	-
YDR133C	2	0	1	1	4	720959	721294	-
smorf49024	0	0	0	1	4	658052	658084	-
smorf49050	0	0	0	1	4	652652	652684	-
smorf49153	0	0	0	1	4	621467	621499	-
smorf49220	0	0	0	1	4	599945	599977	-
YDR048C	2	0	1	0	4	553082	553396	-
smorf49728	0	0	0	1	4	454946	454984	-
smorf49813	0	0	0	1	4	431948	432013	-
YDL016C	1	0	1	0	4	425567	425869	-
YDL023C	1	0	1	0	4	411758	412078	-
YDL022C-A	2	0	0	0	4	409805	410053	-
YDL039C	4	0	1	0	4	381983	382330	-
smorf50137	0	0	0	1	4	336203	336235	-

smorf50540	0	0	0	1	4	233984	234019	-
smorf50633	0	0	0	1	4	212423	212476	-
YDL158C	2	0	1	0	4	173867	174175	-
YDL162C	3	0	1	0	4	167360	167716	-
YDL187C	3	0	1	0	4	125510	125839	-
smorf50948	0	0	0	1	4	106886	106924	-
smorf50973	0	0	0	1	4	95789	95860	-
YDR543C	4	0	1	0	4	1524619	1524918	-
YDR537C	1	1	1	0	4	1510846	1511451	-
YDR504C	3	0	1	0	4	1456303	1456686	-
smorf51627	0	0	0	1	4	1436611	1436718	-
YDR467C	1	0	1	0	4	1397575	1397901	-
YDR455C	2	0	1	0	4	1367365	1367673	-
YDR426C	2	0	1	0	4	1321621	1321998	-
smorf52220	0	0	0	1	4	1258339	1258491	-
smorf52555	0	0	0	1	4	1178314	1178373	-
smorf52575	0	0	0	1	4	1174654	1174851	-
YDR344C	3	0	1	0	4	1162000	1162443	-
YDR271C	3	0	1	0	4	1008391	1008762	-
smorf53287	0	0	0	1	4	1005046	1005117	-
YDR250C	4	0	0	0	4	960082	960357	-
smorf53563	0	0	0	1	4	945892	945936	-
smorf53652	0	0	0	1	4	917170	917232	-
smorf53654	0	0	0	1	4	916021	916134	-
smorf53663	0	0	0	1	4	913627	913743	-
YDR215C	3	0	1	0	4	894115	894498	-
smorf53766	0	0	0	1	4	878047	878079	-
YDR209C	3	0	1	0	4	871033	871446	-
YDR154C	2	0	1	1	4	768400	768750	-
YDR136C	3	0	1	0	4	727708	728280	-
smorf54585	0	0	0	1	4	654688	654765	-
smorf54726	0	0	0	1	4	620980	621012	-
smorf54868	0	0	0	1	4	593206	593301	-
smorf54933	0	0	0	1	4	575737	575853	-
YDR042C	4	0	1	0	4	540598	541200	-
smorf55218	0	0	0	1	4	489124	489162	-
smorf55290	0	0	0	1	4	471439	471495	-
smorf55351	0	0	0	1	4	456238	456270	-
YDL007C-A	4	0	0	0	4	436564	436821	-
smorf55425	0	0	0	1	4	436168	436251	-
YDL009C	1	0	1	0	4	432922	433245	-
smorf55658	0	0	0	1	4	371014	371046	-
smorf55670	0	0	0	1	4	366526	366576	-
YDL071C	4	0	1	0	4	330667	331041	-
smorf55909	0	0	0	1	4	292423	292590	-
smorf56030	0	0	0	1	4	251278	251316	-
smorf56077	0	0	0	1	4	241069	241131	-
smorf56119	0	0	0	1	4	228826	228873	-
smorf56326	0	0	0	1	4	169915	169965	-
smorf56867	0	0	0	1	4	32011	32058	-
YDL240C-A	3	1	0	0	4	22471	22608	-
smorf56916	0	0	0	1	4	18775	18831	-
YDR491C	4	0	1	0	4	1434492	1434983	-
smorf57468	0	0	0	1	4	1412298	1412366	-
smorf57654	0	0	0	1	4	1362792	1362836	-
YDR417C	3	0	1	0	4	1301547	1301918	-
smorf58608	0	0	0	1	4	1103211	1103294	-
YDR274C	3	0	1	0	4	1011585	1011956	-
smorf59063	0	0	0	1	4	966114	966170	-
smorf59229	0	0	0	1	4	936189	936284	-
YDR220C	2	0	0	0	4	906996	907289	-
smorf59350	0	0	0	1	4	892692	892763	-
smorf59455	0	0	0	1	4	870687	870725	-
YDR183C-A	4	0	0	0	4	830394	830651	-
YDR169C-A	2	0	0	0	4	794571	794720	-
smorf59800	0	0	0	1	4	772092	772151	-
smorf59810	0	0	0	1	4	770103	770177	-
smorf60032	0	0	0	1	4	703803	703904	-
YDR114C	2	0	1	0	4	681921	682223	-
YDR102C	2	0	1	0	4	657645	657977	-
smorf60191	0	0	0	1	4	653022	653054	-
YDR095C	4	0	1	0	4	636114	636524	-
smorf60266	0	0	0	1	4	630819	630872	-

YDR010C	1	0	1	0	4	465048	465380	-
YDR008C	1	0	1	0	4	462249	462599	-
smorf60956	0	0	0	1	4	444048	444137	-
smorf60991	0	0	0	1	4	434001	434060	-
smorf61097	0	0	0	1	4	398877	398924	-
smorf61406	0	0	0	1	4	304755	304802	-
YDL094C	3	0	1	0	4	289572	290081	-
YDL096C	1	0	1	0	4	286998	287324	-
smorf61569	0	0	0	1	4	267444	267530	-
YDL185C-A	4	0	0	0	4	126609	126836	-
smorf62109	0	0	0	1	4	117198	117236	-
smorf62112	0	0	0	1	4	115836	115898	-
smorf62310	0	0	0	1	4	50589	50633	-
smorf62511	0	0	0	1	5	7951	8040	+
YEL059W	3	1	1	0	5	42652	42960	+
YEL033W	4	0	1	0	5	86179	86598	+
YEL028W	4	0	1	0	5	98668	99129	+
smorf62932	0	0	0	1	5	118420	118458	+
YEL010W	1	0	1	0	5	136279	136629	+
YEL008W	4	0	1	0	5	140512	140892	+
smorf63050	0	0	0	1	5	151621	151719	+
smorf63130	0	0	0	1	5	167041	167082	+
smorf63147	0	0	0	1	5	173593	173772	+
smorf63519	0	0	0	1	5	270754	270825	+
smorf63564	0	0	0	1	5	279910	279960	+
YER084W	4	0	1	0	5	327061	327447	+
smorf64045	0	0	0	1	5	430519	430578	+
YER137W-A	1	0	1	0	5	441571	441876	+
YER146W	2	1	0	1	5	462580	462861	+
YER158W-A	1	0	0	0	5	491482	491697	+
smorf64462	0	0	0	1	5	555322	555360	+
YER189W	3	0	1	0	5	571150	571518	+
YEL050W-A	2	0	0	0	5	59549	59740	+
smorf64775	0	0	0	1	5	65264	65317	+
smorf65710	0	0	0	1	5	314201	314233	+
YER097W	3	0	1	0	5	355136	355465	+
YER107W-A	3	0	1	0	5	374390	374710	+
smorf66025	0	0	0	1	5	399110	399145	+
YER121W	2	0	1	1	5	402371	402715	+
smorf66203	0	0	0	1	5	437984	438034	+
YER152W-A	1	0	1	0	5	473480	474046	+
smorf66586	0	0	0	1	5	535811	535897	+
smorf66604	0	0	0	1	5	541139	541216	+
YEL074W	1	0	1	0	5	6126	6464	+
smorf66747	0	0	0	1	5	9996	10034	+
smorf66755	0	1	0	1	5	11295	11366	+
smorf66822	0	0	0	1	5	26121	26192	+
smorf66888	0	0	0	1	5	45600	45656	+
smorf66919	0	0	0	1	5	53862	53975	+
smorf67383	0	0	0	1	5	192408	192488	+
smorf67420	0	0	0	1	5	207645	207695	+
smorf67539	0	0	0	1	5	240741	240779	+
YER046W-A	1	0	1	0	5	243699	244028	+
YER076W-A	3	0	1	0	5	313386	313733	+
YER078W-A	2	0	0	0	5	318642	318806	+
smorf67915	0	0	0	1	5	336690	336863	+
smorf67961	0	0	0	1	5	347898	347951	+
smorf68026	0	0	0	1	5	363729	363782	+
smorf68051	0	0	0	1	5	373230	373307	+
smorf68094	0	1	0	1	5	382479	382559	+
smorf68273	0	0	0	1	5	430731	430793	+
YER133W-A	1	0	1	0	5	437187	437528	+
smorf68350	0	0	0	1	5	449586	449654	+
YER175W-A	2	0	0	1	5	540645	540809	+
YER188W	4	0	1	0	5	568035	568754	+
smorf68853	0	0	0	1	5	561120	561182	-
YER165C-A	2	0	1	0	5	512622	512978	-
YER147C-A	2	1	1	0	5	465198	465608	-
YER145C-A	2	1	1	0	5	462381	462818	-
smorf69388	0	0	0	1	5	412839	412898	-
smorf69431	0	0	0	1	5	402234	402275	-
YER119C-A	4	1	1	0	5	400863	401234	-
YER068C-A	2	0	1	0	5	295299	295730	-

smorf70338	0	0	0	1	5	177402	177560	-
YER006C-A	3	0	1	0	5	164343	164660	-
smorf70420	0	0	0	1	5	156384	156431	-
smorf70503	0	0	0	1	5	136851	136916	-
YEL009C-A	1	0	1	0	5	136371	136778	-
smorf70505	0	0	0	1	5	136110	136319	-
smorf70585	0	0	0	1	5	110916	111017	-
smorf70909	0	0	0	1	5	16041	16097	-
smorf70939	0	0	0	1	5	8742	8774	-
YER188C-A	4	0	1	0	5	569603	569902	-
smorf71004	0	0	0	1	5	562709	562747	-
YER135C	1	0	1	0	5	437948	438340	-
smorf71467	0	0	0	1	5	435491	435532	-
smorf71579	0	0	0	1	5	410150	410194	-
smorf71700	0	0	0	1	5	364208	364246	-
YER091C-A	4	1	0	0	5	342386	342607	-
YER079C-A	1	0	1	0	5	319898	320236	-
smorf71940	0	0	0	1	5	295199	295255	-
YER066C-A	4	0	1	0	5	291701	292201	-
smorf72061	0	0	0	1	5	261278	261373	-
smorf72112	0	0	0	1	5	249749	249793	-
smorf72120	0	0	0	1	5	248804	248851	-
smorf72312	0	0	0	1	5	187994	188047	-
smorf72319	0	0	0	1	5	187109	187141	-
smorf72431	0	0	0	1	5	151757	151795	-
YEL014C	4	0	1	0	5	128303	128608	-
smorf72632	0	0	0	1	5	106787	106822	-
smorf72649	0	0	0	1	5	99461	99493	-
YEL030C-A	1	0	1	0	5	94583	94897	-
YEL034C-A	3	0	1	0	5	85613	86215	-
YEL045C	4	1	1	0	5	68840	69265	-
smorf72795	0	0	0	1	5	61577	61729	-
YEL057C	4	1	1	0	5	45020	45721	-
YEL067C	3	0	1	0	5	26189	26776	-
YEL068C	4	0	1	1	5	25646	25978	-
smorf72984	0	0	0	1	5	11255	11296	-
smorf72993	0	0	0	1	5	9080	9133	-
YEL075C	3	0	1	0	5	5345	5713	-
YER186C	4	0	1	0	5	561700	562620	-
smorf73146	0	0	0	1	5	546496	546540	-
smorf73164	0	0	0	1	5	541351	541413	-
YER088C-A	4	0	1	0	5	335692	336015	-
YER087C-A	1	1	1	0	5	331813	332364	-
smorf73888	0	0	0	1	5	307234	307470	-
smorf73957	0	0	0	1	5	288238	288276	-
smorf74267	0	0	0	1	5	193123	193170	-
smorf74305	0	0	0	1	5	178447	178578	-
smorf74443	0	0	0	1	5	143881	143985	-
smorf74625	0	0	0	1	5	98596	98640	-
YEL035C	4	0	1	0	5	85045	85545	-
smorf74705	0	0	0	1	5	76984	77025	-
smorf74938	0	0	0	1	5	13210	13266	-
smorf75320	0	0	0	1	6	89674	89748	+
smorf75360	0	0	0	1	6	99124	99189	+
YFL012W-A	4	0	1	0	6	109804	110178	+
YFL012W	4	0	1	0	6	110641	111087	+
YFR012W-A	4	0	0	0	6	169216	169302	+
smorf75733	0	0	0	1	6	191881	191916	+
smorf75742	0	0	0	1	6	193462	193518	+
smorf75904	0	0	0	1	6	245497	245532	+
YFL068W	3	0	1	0	6	53	535	+
YFL063W	4	0	1	0	6	5066	5521	+
YFL032W	4	0	1	0	6	74870	75190	+
smorf76229	0	0	0	1	6	89600	89644	+
YFL015W-A	1	0	1	0	6	106409	106726	+
smorf76365	0	0	0	1	6	134954	135001	+
smorf76511	0	0	0	1	6	192305	192346	+
YFR034W-A	3	0	0	0	6	226010	226297	+
smorf76764	0	0	0	1	6	262199	262249	+
smorf77007	0	0	0	1	6	47919	47951	+
smorf77054	0	0	0	1	6	55002	55091	+
smorf77148	0	0	0	1	6	78978	79094	+
smorf77213	0	0	0	1	6	100179	100244	+

YFL013W-A	1	1	1	0	6	107793	108596	+
YFL010W-A	3	1	0	0	6	114984	115268	+
YFR020W	3	0	1	1	6	192726	193424	+
smorf77833	0	0	0	1	6	260552	260584	-
YFR054C	2	0	1	0	6	258842	259420	-
YFR035C	3	0	1	0	6	226109	226453	-
YFR026C	3	0	1	0	6	205736	206245	-
smorf78218	0	0	0	1	6	149729	149770	-
smorf78313	0	0	0	1	6	123035	123070	-
YFL015C	3	0	1	0	6	106463	106957	-
YFL021C-A	3	0	1	0	6	95759	96613	-
smorf78424	0	0	0	1	6	77465	77524	-
YFR056C	2	0	1	0	6	263944	264312	-
smorf78711	0	0	0	1	6	263068	263109	-
smorf78882	0	0	0	1	6	207121	207261	-
smorf79073	0	0	0	1	6	158926	159009	-
YFL019C	2	0	1	0	6	100246	100599	-
smorf79717	0	0	0	1	6	4204	4263	-
YFR052C-A	3	0	1	1	6	253416	253721	-
YFR032C-B	4	1	0	0	6	223698	223961	-
smorf80369	0	0	0	1	6	87627	87728	-
smorf80529	0	0	0	1	6	30987	31049	-
smorf80745	0	0	0	1	7	27832	27864	+
smorf80888	0	0	0	1	7	80590	80730	+
YGL149W	4	0	1	0	7	225577	225882	+
smorf81745	0	0	0	1	7	320044	320127	+
smorf81759	0	0	0	1	7	324412	324528	+
smorf82010	0	0	0	1	7	397786	397863	+
smorf82091	0	0	0	1	7	423463	423528	+
YGL007W	4	0	1	0	7	483265	483642	+
smorf82292	0	0	0	1	7	484081	484125	+
YGL006W-A	2	0	0	0	7	485428	485538	+
smorf82352	0	0	0	1	7	497209	497346	+
smorf82357	0	0	0	1	7	498199	498249	+
YGR035W-A	4	0	0	0	7	557569	557790	+
smorf82652	0	0	0	1	7	582529	582618	+
smorf82694	0	0	0	1	7	593200	593247	+
smorf82788	0	0	0	1	7	616363	616407	+
smorf82793	0	0	0	1	7	617440	617502	+
smorf82812	0	0	0	1	7	622252	622290	+
smorf83149	0	0	0	1	7	700111	700164	+
YGR121W-A	1	0	0	0	7	733417	733632	+
smorf83285	0	0	0	1	7	751753	751794	+
YGR161W-C	4	1	0	1	7	810232	810510	+
YGR176W	4	0	1	0	7	848725	849072	+
smorf83652	0	0	0	1	7	850819	850908	+
smorf84105	0	0	0	1	7	969871	969936	+
YGR242W	3	0	1	0	7	976420	976728	+
YGR265W	3	1	1	0	7	1021654	1022064	+
smorf84360	0	0	0	1	7	1052077	1052133	+
smorf84449	0	0	0	1	7	1079131	1079178	+
smorf84505	0	0	0	1	7	2411	2464	+
YGL260W	4	0	0	0	7	6860	7090	+
smorf84832	0	0	0	1	7	78776	78865	+
YGL214W	1	0	1	0	7	90011	90499	+
smorf84862	0	0	0	1	7	95192	95242	+
smorf85003	0	0	0	1	7	147767	147814	+
smorf85155	0	0	0	1	7	193649	193708	+
smorf85397	0	0	0	1	7	263978	264013	+
smorf85459	0	0	0	1	7	280871	281014	+
smorf85987	0	0	0	1	7	427322	427393	+
YGR011W	1	0	1	1	7	512501	512827	+
YGR025W	4	0	1	0	7	532643	532945	+
smorf86488	0	1	0	1	7	567740	567775	+
smorf86494	0	0	0	1	7	568520	568570	+
YGR039W	4	0	1	1	7	574892	575203	+
smorf86619	0	0	0	1	7	605705	605821	+
smorf86621	0	0	0	1	7	607295	607333	+
YGR107W	4	0	1	0	7	702671	703120	+
YGR137W	1	0	1	1	7	762893	763267	+
YGR139W	4	0	1	0	7	765731	766069	+
smorf87446	0	0	0	1	7	848543	848581	+
smorf87578	0	0	0	1	7	884519	884578	+

smorf87988	0	0	0	1	7	1014671	1014724	+
smorf88172	0	0	0	1	7	1050617	1050664	+
smorf88327	0	0	0	1	7	1083083	1083121	+
smorf88409	0	0	0	1	7	18942	19028	+
YGL218W	1	0	1	0	7	83649	84299	+
smorf88940	0	0	0	1	7	140286	140321	+
YGL168W	3	0	1	0	7	187470	187802	+
smorf89120	0	0	0	1	7	190782	190814	+
YGL132W	1	0	1	0	7	261585	261920	+
smorf89429	0	0	0	1	7	274692	274733	+
YGL109W	2	0	1	0	7	303516	303839	+
smorf89625	0	0	0	1	7	328071	328109	+
smorf89629	0	0	0	1	7	328797	328859	+
smorf89721	0	0	0	1	7	349503	349535	+
smorf89852	0	0	0	1	7	383574	383615	+
YGL052W	3	0	1	0	7	403440	403745	+
YGL024W	4	0	1	0	7	449793	450128	+
smorf90320	0	0	0	1	7	523263	523295	+
smorf90429	0	0	0	1	7	559632	559670	+
YGR064W	2	0	1	0	7	617625	617993	+
YGR069W	2	0	1	0	7	627087	627422	+
smorf90910	0	0	0	1	7	707037	707102	+
smorf91035	0	0	0	1	7	729969	730064	+
smorf91067	0	0	0	1	7	736545	736595	+
smorf91081	0	0	0	1	7	739431	739466	+
smorf91220	0	0	0	1	7	778239	778274	+
smorf91231	0	0	0	1	7	780240	780278	+
smorf91458	0	0	0	1	7	842718	842804	+
YGR174W-A	1	0	0	1	7	846660	846746	+
smorf91526	0	0	0	1	7	856395	856460	+
smorf91842	0	0	0	1	7	939393	939452	+
smorf91935	0	0	0	1	7	959277	959390	+
smorf91972	0	0	0	1	7	968982	969029	+
smorf91978	0	0	0	1	7	970359	970427	+
smorf92062	0	0	0	1	7	994323	994376	+
YGR269W	4	0	1	0	7	1026642	1026968	+
YGR290W	1	0	1	0	7	1075488	1075931	+
YGR291C	2	0	0	0	7	1076289	1076510	-
smorf92856	0	0	0	1	7	944652	944711	-
YGR204C-A	2	0	0	0	7	909066	909179	-
smorf93508	0	0	0	1	7	757302	757373	-
smorf93603	0	0	0	1	7	735936	735971	-
smorf93719	0	0	0	1	7	702669	702731	-
YGR073C	2	0	1	0	7	635619	635990	-
smorf94182	0	0	0	1	7	584688	584723	-
YGR045C	3	1	1	0	7	583938	584300	-
smorf94358	0	0	0	1	7	535677	535742	-
smorf94506	0	0	0	1	7	506619	506678	-
YGL007C-A	4	0	0	0	7	482946	483032	-
YGL015C	4	1	1	0	7	465048	465440	-
smorf94949	0	0	0	1	7	393540	393611	-
smorf95240	0	0	0	1	7	312918	312971	-
smorf95573	0	0	0	1	7	213684	213764	-
smorf95726	0	0	0	1	7	166047	166079	-
YGL188C	4	0	0	1	7	149349	149522	-
YGL188C-A	2	0	0	1	7	148830	148970	-
smorf95812	0	0	0	1	7	142845	142883	-
smorf96008	0	0	0	1	7	97359	97409	-
YGL239C	4	0	1	0	7	49431	49745	-
smorf96264	0	0	0	1	7	17652	17702	-
YGR293C	3	0	1	0	7	1079891	1080352	-
smorf96578	0	0	0	1	7	1022303	1022368	-
YGR240C-A	2	0	0	0	7	974582	974782	-
YGR190C	2	0	1	0	7	880301	880666	-
YGR168C	4	0	1	0	7	833357	834487	-
smorf97346	0	0	0	1	7	810800	810877	-
smorf97375	0	0	0	1	7	801305	801340	-
smorf97381	0	0	0	1	7	800087	800122	-
smorf97443	0	0	0	1	7	788621	788662	-
smorf97606	0	0	0	1	7	742127	742186	-
smorf97641	0	0	0	1	7	733088	733153	-
YGR114C	3	0	1	0	7	720269	720658	-
YGR051C	4	0	1	0	7	592910	593233	-

smorf98229	0	0	0	1	7	578588	578620	-
smorf98374	0	0	0	1	7	544250	544306	-
smorf98451	0	0	0	1	7	523250	523357	-
smorf98594	0	0	0	1	7	484817	484855	-
smorf98709	0	0	0	1	7	443324	443368	-
smorf98720	0	0	0	1	7	439850	439885	-
smorf98721	0	0	0	1	7	439748	439789	-
YGL041C-B	3	0	0	0	7	418709	418891	-
YGL042C	2	0	1	0	7	418292	418597	-
YGL072C	2	0	1	0	7	371006	371365	-
smorf98974	0	0	0	1	7	366572	366604	-
smorf99156	0	0	0	1	7	316757	316792	-
smorf99164	0	0	0	1	7	314270	314311	-
YGL118C	3	0	1	0	7	288020	288457	-
smorf99261	0	0	0	1	7	287051	287089	-
smorf99482	0	0	0	1	7	226082	226147	-
smorf99769	0	0	0	1	7	159650	159688	-
smorf100721	0	0	0	1	7	1000165	1000230	-
smorf100794	0	0	0	1	7	985699	985752	-
smorf100834	0	0	0	1	7	974215	974337	-
smorf100895	0	0	0	1	7	958933	958974	-
smorf101250	0	0	0	1	7	879781	879813	-
YGR182C	3	0	1	0	7	858556	858909	-
smorf101381	0	0	0	1	7	832018	832071	-
smorf101468	0	0	0	1	7	811213	811263	-
YGR146C-A	4	0	0	0	7	785281	785442	-
smorf101972	0	0	0	1	7	678058	678105	-
smorf101997	0	0	0	1	7	670585	670626	-
smorf102070	0	0	0	1	7	653920	653988	-
YGR050C	3	0	1	1	7	592090	592446	-
smorf102302	0	0	0	1	7	591409	591462	-
smorf102346	0	0	0	1	7	577399	577431	-
smorf102578	0	0	0	1	7	522658	522690	-
smorf102607	0	0	0	1	7	512833	512871	-
smorf102881	0	0	0	1	7	438406	438486	-
YGL034C	4	0	1	0	7	433219	433584	-
smorf103107	0	0	0	1	7	370864	370908	-
YGL074C	2	0	1	0	7	368599	368925	-
YGL108C	4	0	1	1	7	303652	304074	-
smorf103525	0	0	0	1	7	257170	257271	-
YGL152C	1	1	1	0	7	216697	217374	-
YGL165C	2	0	1	0	7	191404	191982	-
YGL170C	4	0	1	0	7	184159	185400	-
YGL182C	2	0	1	0	7	157279	157602	-
smorf103946	0	0	0	1	7	145378	145422	-
YGL193C	4	1	1	0	7	141922	142233	-
YGL230C	4	0	1	0	7	63772	64215	-
smorf104319	0	0	0	1	7	34906	34941	-
smorf104406	0	0	0	1	7	14842	14883	-
YHL046W-A	1	0	1	0	8	9979	10305	+
smorf104654	0	0	0	1	8	59011	59079	+
smorf104709	0	0	0	1	8	76747	76794	+
smorf104863	0	0	0	1	8	123895	123993	+
YHR014W	4	0	1	0	8	132040	132915	+
YHR021W-A	3	0	1	1	8	149218	149673	+
smorf104960	0	0	0	1	8	151147	151185	+
smorf105197	0	1	0	1	8	203788	203823	+
smorf105514	0	0	0	1	8	294064	294120	+
YHR125W	3	0	1	0	8	358861	359166	+
smorf105691	0	0	0	1	8	364498	364530	+
YHR131W-A	3	0	0	0	8	367750	367995	+
smorf105966	0	0	0	1	8	429466	429498	+
smorf106114	0	0	0	1	8	458206	458241	+
YHR180W	2	0	1	0	8	465178	465669	+
YHR214W	4	1	1	0	8	541651	542262	+
YHL045W	4	0	1	0	8	12500	12847	+
YHL041W	3	0	1	0	8	17390	17839	+
smorf106642	0	0	0	1	8	32627	32662	+
smorf106734	0	0	0	1	8	63038	63121	+
YHL015W-A	1	0	0	0	8	74696	74779	+
smorf107088	0	1	0	1	8	147224	147307	+
YHR028W-A	1	0	1	0	8	167345	167665	+
smorf107240	0	0	0	1	8	201716	201763	+

smorf107439	0	0	0	1	8	255881	255955	+
smorf107449	0	0	0	1	8	258044	258118	+
YHR093W	4	0	1	0	8	289145	289693	+
YHR095W	4	0	1	0	8	292946	293380	+
smorf107930	0	0	0	1	8	379766	379813	+
YHR157W	4	0	1	0	8	412910	413458	+
smorf108318	0	1	0	1	8	497279	497326	+
YHR213W-B	3	0	1	0	8	540800	541099	+
YHL030W-A	1	1	1	0	8	39072	39533	+
YHL006W-A	3	0	1	0	8	97728	98081	+
smorf108956	0	0	0	1	8	111591	111656	+
smorf108972	0	0	0	1	8	115494	115637	+
smorf109013	0	0	0	1	8	122025	122075	+
YHR032W-A	2	0	0	0	8	175188	175367	+
smorf109256	0	0	0	1	8	201651	201719	+
YHR050W-A	4	1	0	0	8	209469	209639	+
YHR063W-A	4	0	1	0	8	225444	225779	+
YHR086W-A	2	0	0	0	8	280233	280394	+
YHR175W-A	2	0	0	0	8	453558	453707	+
smorf110033	0	0	0	1	8	461685	461747	+
YHR180W-A	1	0	0	0	8	466932	467114	+
YHR213W-A	2	0	0	0	8	540549	540782	+
smorf110358	0	1	0	1	8	551709	551744	+
YHR212C	3	0	1	0	8	537759	538094	-
smorf110790	0	0	0	1	8	465387	465443	-
YHR130C	3	0	1	0	8	364968	365303	-
smorf111229	0	0	0	1	8	354465	354566	-
smorf111374	0	0	0	1	8	319788	319823	-
smorf111506	0	0	0	1	8	276477	276539	-
smorf111615	0	0	0	1	8	235818	235901	-
YHR049C-A	4	0	1	0	8	207213	207524	-
smorf111723	0	0	0	1	8	207087	207131	-
smorf111734	0	0	0	1	8	204180	204230	-
smorf111823	0	0	0	1	8	181650	181709	-
smorf111826	0	0	0	1	8	181290	181322	-
smorf111909	0	0	0	1	8	160239	160277	-
smorf111951	0	0	0	1	8	146616	146774	-
smorf112012	0	0	0	1	8	127623	127712	-
YHL037C	4	0	1	0	8	25698	26177	-
smorf112648	0	0	0	1	8	520070	520240	-
smorf112860	0	0	0	1	8	464582	464635	-
YHR173C	4	0	1	0	8	450815	451153	-
smorf112907	0	0	0	1	8	450617	450673	-
smorf113148	0	0	0	1	8	386897	387010	-
smorf113154	0	0	0	1	8	386000	386080	-
smorf113178	0	0	0	1	8	381509	381550	-
YHR139C-A	3	0	1	0	8	380111	380422	-
YHR126C	4	1	1	0	8	359705	360184	-
smorf113258	0	0	0	1	8	357341	357391	-
smorf113727	0	0	0	1	8	255779	255835	-
smorf113743	0	0	0	1	8	250238	250291	-
smorf114116	0	0	0	1	8	149315	149437	-
smorf114165	0	0	0	1	8	135200	135262	-
YHR214C-E	4	0	1	0	8	551200	551499	-
YHR214C-D	4	0	0	0	8	550648	550941	-
smorf114808	0	0	0	1	8	517075	517149	-
smorf115260	0	0	0	1	8	383815	383856	-
smorf115652	0	0	0	1	8	273298	273372	-
smorf115731	0	0	0	1	8	242098	242193	-
YHR071C-A	4	0	1	0	8	238912	239232	-
smorf115744	0	1	0	1	8	238777	238809	-
YHR070C-A	4	0	1	0	8	236104	236514	-
YHR022C-A	2	0	0	0	8	151210	151299	-
YHR007C-A	3	0	0	0	8	122545	122760	-
YHL005C	4	0	1	0	8	98824	99216	-
smorf116529	0	0	0	1	8	10999	11037	-
YHL048C-A	1	0	0	0	8	5662	5796	-
smorf116657	0	0	0	1	9	22741	22818	+
smorf116696	0	0	0	1	9	35152	35202	+
smorf116838	0	0	0	1	9	88921	88965	+
smorf116878	0	0	0	1	9	100075	100119	+
smorf116967	0	0	0	1	9	136696	136734	+
smorf116971	0	0	0	1	9	137896	137943	+

YIL115W-A	1	0	1	0	9	144265	144636	+
smorf117113	0	0	0	1	9	173965	174027	+
YIL100W	1	0	1	0	9	177370	177723	+
smorf117193	0	0	0	1	9	199567	199659	+
smorf117261	0	0	0	1	9	220966	221073	+
YIL071W-A	1	1	1	0	9	228547	229023	+
smorf117394	0	0	0	1	9	257455	257496	+
YIL030W-A	1	0	1	0	9	295564	295902	+
YIL029W-A	3	0	1	0	9	299734	300105	+
smorf117555	0	0	0	1	9	301606	301680	+
YIL028W	3	0	1	0	9	302098	302496	+
smorf117679	0	0	0	1	9	338947	339033	+
smorf117865	0	0	0	1	9	394699	394737	+
YIR036W-A	1	0	1	0	9	422632	423033	+
YIL171W-A	2	0	1	0	9	18260	18712	+
smorf118678	0	0	0	1	9	173933	173968	+
YIL089W	4	0	1	0	9	195596	196213	+
smorf118917	0	0	0	1	9	230177	230227	+
YIL058W	3	0	0	0	9	246911	247195	+
smorf119115	0	0	0	1	9	289295	289345	+
smorf119262	0	0	0	1	9	329378	329410	+
smorf119360	0	0	0	1	9	357269	357310	+
smorf119734	0	0	0	1	9	23823	23876	+
smorf119777	0	0	0	1	9	31092	31139	+
smorf119808	0	0	0	1	9	36114	36158	+
YIL156W-A	4	0	1	0	9	47292	47693	+
YIL141W	4	0	1	0	9	85053	85442	+
YIL092W	4	1	1	0	9	189063	190964	+
YIL068W-A	1	0	1	0	9	233010	233393	+
YIL066W-A	1	0	1	0	9	237363	237806	+
smorf120578	0	0	0	1	9	247617	247664	+
YIL054W	4	0	1	0	9	254541	254858	+
smorf120787	0	0	0	1	9	304389	304478	+
smorf120884	0	0	0	1	9	330951	330995	+
YIL012W	4	0	1	0	9	333009	333401	+
smorf120914	0	0	0	1	9	337368	337418	+
smorf121055	0	0	0	1	9	380895	380957	+
YIR020W-A	4	0	0	0	9	394914	395156	+
YIR021W-A	3	0	0	0	9	398511	398723	+
YIR030W-A	2	0	1	0	9	412896	413279	+
smorf121270	0	0	0	1	9	436116	436148	+
YIR040C	4	0	1	0	9	433385	433717	-
smorf121346	0	0	0	1	9	427286	427333	-
smorf121439	0	0	0	1	9	399455	399547	-
smorf121660	0	0	0	1	9	336992	337081	-
smorf122052	0	0	0	1	9	216374	216406	-
YIL086C	3	0	1	0	9	200150	200458	-
smorf122142	0	0	0	1	9	196193	196255	-
smorf122283	0	0	0	1	9	151262	151297	-
smorf122623	0	0	0	1	9	51524	51571	-
YIL163C	4	0	1	0	9	36899	37252	-
smorf122693	0	0	0	1	9	28628	28672	-
smorf122921	0	0	0	1	9	407902	407943	-
YIR020C	3	0	1	0	9	394252	394554	-
YIL014C-A	4	0	1	1	9	325210	325524	-
smorf123208	0	0	0	1	9	321775	321885	-
YIL020C-A	2	0	1	0	9	313711	314049	-
smorf123421	0	0	0	1	9	261652	261687	-
smorf123463	0	0	0	1	9	248593	248637	-
YIL059C	3	0	1	1	9	246547	246912	-
smorf124022	0	0	0	1	9	84406	84456	-
smorf124209	0	0	0	1	9	35836	35880	-
smorf124416	0	0	0	1	9	414723	414773	-
YIR020C-B	1	0	1	0	9	397212	397946	-
smorf124532	0	0	0	1	9	379863	379904	-
YIL025C	3	0	1	0	9	308199	308573	-
YIL032C	2	0	1	0	9	291960	292316	-
smorf125126	0	0	0	1	9	197379	197411	-
YIL102C	4	0	1	0	9	174579	174884	-
smorf125320	0	0	0	1	9	142359	142403	-
YIL134C-A	2	0	0	0	9	96522	96725	-
smorf125470	0	0	0	1	9	93213	93362	-
YIL142C-A	2	0	1	0	9	83208	83540	-

smorf125534	0	1	0	1	9	69636	69725	-
YJL222W-B	4	0	0	0	10	9346	9483	+
smorf125976	0	0	0	1	10	47842	47874	+
smorf126009	0	1	0	1	10	59371	59451	+
smorf126246	0	0	0	1	10	111253	111285	+
smorf126250	0	0	0	1	10	111706	111753	+
smorf126289	0	0	0	1	10	123859	123936	+
YJL136W-A	2	0	0	0	10	156166	156249	+
YJL118W	4	0	1	0	10	191638	192297	+
smorf126666	0	0	0	1	10	220603	220695	+
smorf126693	0	0	0	1	10	228976	229017	+
smorf126883	0	0	0	1	10	278020	278061	+
YJL037W	4	0	1	0	10	376657	377331	+
YJL028W	2	0	1	0	10	391306	391641	+
smorf127418	0	1	0	1	10	458479	458526	+
YJR037W	2	0	1	0	10	503095	503478	+
smorf127615	0	0	0	1	10	517990	518034	+
smorf127640	0	0	0	1	10	525685	525744	+
smorf127837	0	1	0	1	10	581608	581682	+
YJR087W	2	1	1	0	10	586393	586743	+
YJR114W	1	0	1	0	10	638653	639045	+
smorf128090	0	0	0	1	10	651301	651345	+
YJR146W	4	0	1	0	10	703879	704232	+
smorf128370	0	0	0	1	10	712081	712125	+
YJR151W-A	1	0	0	0	10	717574	717624	+
YJL222W-A	4	0	0	0	10	9452	9679	+
smorf128767	0	0	0	1	10	59039	59086	+
smorf128970	0	0	0	1	10	117947	117991	+
YJL150W	4	0	1	0	10	137120	137422	+
smorf129102	0	0	0	1	10	153221	153253	+
smorf129115	0	0	0	1	10	156395	156445	+
YJL135W	3	0	1	0	10	157874	158191	+
smorf129198	0	0	0	1	10	173483	173533	+
smorf129212	0	0	0	1	10	177938	177991	+
YJL127W-A	4	0	0	0	10	180191	180307	+
YJL120W	2	0	1	0	10	191021	191344	+
smorf129362	0	0	0	1	10	211907	211951	+
smorf129418	0	0	0	1	10	223724	223765	+
YJL009W	4	0	1	0	10	419849	420175	+
YJR071W	4	0	1	0	10	570398	570766	+
smorf130701	0	0	0	1	10	585677	585751	+
smorf130814	0	0	0	1	10	613244	613282	+
YJR108W	4	0	1	0	10	628706	629077	+
YJR120W	4	0	1	0	10	647120	647470	+
YJR128W	3	0	1	0	10	662915	663274	+
smorf131166	0	0	0	1	10	722720	722752	+
YJL220W	2	0	1	0	10	18243	18695	+
YJL217W	4	0	1	1	10	23133	23729	+
smorf131352	0	0	0	1	10	31833	31901	+
smorf131424	0	0	0	1	10	50313	50354	+
YJL169W	3	0	1	0	10	102093	102461	+
YJL156W-A	4	0	0	0	10	126600	126821	+
smorf131931	0	0	0	1	10	195084	195116	+
smorf132156	0	0	0	1	10	254280	254318	+
smorf132290	0	0	0	1	10	289554	289616	+
smorf132310	0	0	0	1	10	293244	293282	+
YJL077W-B	3	0	0	0	10	294042	294140	+
smorf132517	0	0	0	1	10	348570	348620	+
smorf132673	0	0	0	1	10	398589	398633	+
smorf132878	0	0	0	1	10	455388	455453	+
smorf132893	0	0	0	1	10	459615	459659	+
YJR018W	2	1	1	0	10	466779	467141	+
YJR020W	1	0	1	0	10	467994	468326	+
smorf133505	0	0	0	1	10	606855	606980	+
smorf133676	0	0	0	1	10	654423	654455	+
smorf133911	0	0	0	1	10	719379	719456	+
YJR157W	1	0	1	0	10	730509	730871	+
smorf134124	0	0	0	1	10	717900	717941	-
smorf134357	0	0	0	1	10	651144	651257	-
smorf134396	0	0	0	1	10	639675	639725	-
smorf134431	0	0	0	1	10	627441	627488	-
smorf134479	0	0	0	1	10	611532	611582	-
YJR038C	3	0	1	0	10	503703	504065	-

YJR023C	1	0	1	0	10	469797	470198	-
smorf135214	0	0	0	1	10	417123	417230	-
smorf135428	0	0	0	1	10	360873	360920	-
YJL075C	2	0	1	0	10	298455	298871	-
YJL119C	4	0	1	0	10	191571	191894	-
smorf136142	0	0	0	1	10	173163	173213	-
YJL142C	2	0	1	0	10	147816	148208	-
smorf136226	0	0	0	1	10	144870	144944	-
smorf136362	0	0	0	1	10	117627	117674	-
smorf136366	0	0	0	1	10	116964	117047	-
smorf136561	0	0	0	1	10	70875	70934	-
YJL195C	2	1	1	0	10	69240	69941	-
smorf136592	0	0	0	1	10	59490	59543	-
YJL202C	3	1	1	0	10	53943	54290	-
smorf136749	0	0	0	1	10	27216	27275	-
YJL215C	3	0	1	0	10	26412	26771	-
YJR162C	4	1	1	0	10	744905	745255	-
smorf136928	0	0	0	1	10	725252	725347	-
smorf136957	0	0	0	1	10	717461	717520	-
smorf137941	0	0	0	1	10	472409	472450	-
YJL038C	4	0	1	0	10	375110	375769	-
smorf138514	0	0	0	1	10	319583	319654	-
smorf138523	0	0	0	1	10	317171	317248	-
smorf138524	0	0	0	1	10	317057	317122	-
smorf138936	0	0	0	1	10	196067	196099	-
YJL182C	2	0	1	0	10	85433	85750	-
smorf139460	0	0	0	1	10	28118	28156	-
smorf139664	0	0	0	1	10	723280	723336	-
smorf139733	0	0	0	1	10	696946	697020	-
smorf140027	0	0	0	1	10	618013	618045	-
smorf140045	0	0	0	1	10	611962	612078	-
smorf140278	0	0	0	1	10	543715	543825	-
smorf140287	0	0	0	1	10	540367	540405	-
smorf140598	0	0	0	1	10	455890	455937	-
YJL015C	3	0	1	0	10	407137	407511	-
YJL027C	4	1	1	0	10	391828	392244	-
smorf141010	0	0	0	1	10	339316	339360	-
YJL077C	3	0	1	0	10	294661	295056	-
YJL086C	3	0	1	0	10	272473	272841	-
smorf141195	0	0	0	1	10	268729	268773	-
smorf141595	0	0	0	1	10	151036	151077	-
smorf141904	0	0	0	1	10	60673	60753	-
YJL211C	2	0	1	0	10	36757	37200	-
smorf142162	0	0	0	1	11	14014	14139	+
smorf142177	0	0	0	1	11	19060	19119	+
YKL177W	1	0	1	0	11	114361	114699	+
smorf142567	0	0	0	1	11	137254	137364	+
YKL136W	1	0	1	0	11	186421	186819	+
YKL123W	2	0	1	1	11	211687	212067	+
YKL118W	2	1	1	0	11	218770	219081	+
smorf143248	0	0	0	1	11	334726	334770	+
YKL044W	4	0	1	0	11	355966	356286	+
YKL031W	4	0	1	0	11	381715	382128	+
YKL030W	1	0	1	0	11	382141	382746	+
YKL023W	4	0	1	1	11	393364	394197	+
smorf143585	0	0	0	1	11	430582	430626	+
smorf143887	0	0	0	1	11	511297	511350	+
YKR041W	4	0	1	0	11	517840	518592	+
smorf143955	0	0	0	1	11	533608	533682	+
smorf144088	0	0	0	1	11	578179	578232	+
smorf144328	0	0	0	1	11	642637	642669	+
YKL225W	4	0	1	0	11	452	799	+
YKL223W	4	0	1	0	11	2390	2722	+
smorf144654	0	0	0	1	11	66560	66604	+
smorf144667	0	0	0	1	11	70325	70372	+
smorf145019	0	0	0	1	11	165677	165712	+
smorf145038	0	0	0	1	11	169064	169099	+
YKL131W	1	0	1	0	11	194477	194998	+
smorf145186	0	0	0	1	11	212579	212614	+
smorf145551	0	0	0	1	11	304169	304216	+
smorf145635	0	0	0	1	11	333947	333985	+
smorf145676	0	0	0	1	11	346646	346687	+
YKL037W	4	0	1	0	11	369008	369364	+

smorf146129	0	0	0	1	11	466085	466153	+
YKR032W	4	0	1	0	11	506159	506473	+
smorf146521	0	0	0	1	11	575900	575950	+
smorf146617	0	0	0	1	11	603629	603664	+
smorf146751	0	0	0	1	11	638051	638113	+
smorf146757	0	0	0	1	11	639845	639898	+
smorf146770	0	0	0	1	11	644831	644899	+
smorf146940	0	0	0	1	11	19704	19745	+
smorf146951	0	0	0	1	11	22023	22103	+
YKL202W	2	0	1	0	11	63822	64403	+
smorf147166	0	0	0	1	11	74061	74159	+
smorf147412	0	0	0	1	11	137379	137420	+
YKL153W	1	0	1	0	11	163605	164114	+
smorf147511	0	0	0	1	11	165507	165551	+
smorf147651	0	0	0	1	11	195207	195242	+
smorf147977	0	0	0	1	11	304530	304595	+
YKL066W	2	0	1	0	11	314925	315368	+
YKL053W	1	0	1	0	11	339216	339590	+
smorf148380	0	0	0	1	11	428571	428636	+
smorf148504	0	0	0	1	11	461235	461321	+
smorf148702	0	0	0	1	11	513795	513842	+
smorf148873	0	0	0	1	11	565518	565571	+
smorf149177	0	0	0	1	11	650268	650339	+
smorf149486	0	0	0	1	11	610775	610867	-
smorf149597	0	0	0	1	11	584360	584392	-
YKR073C	4	0	1	0	11	577829	578149	-
smorf149797	0	0	0	1	11	517001	517135	-
YKR012C	4	0	1	0	11	463382	463759	-
YKL023C-A	4	1	0	1	11	392789	393016	-
smorf150357	0	0	0	1	11	354806	354925	-
smorf150362	0	0	0	1	11	353615	353659	-
smorf150404	0	0	0	1	11	342071	342127	-
smorf150405	0	0	0	1	11	341591	341782	-
smorf150492	0	0	0	1	11	315314	315373	-
smorf150510	0	0	0	1	11	308765	308806	-
YKL102C	3	0	1	0	11	247706	248011	-
smorf150819	0	0	0	1	11	216215	216280	-
smorf150961	0	0	0	1	11	179387	179479	-
smorf151134	0	0	0	1	11	137492	137566	-
smorf151551	0	0	0	1	11	12485	12523	-
smorf151651	0	0	0	1	11	652219	652251	-
YKR040C	1	0	1	0	11	517705	518208	-
smorf152192	0	0	0	1	11	513430	513546	-
smorf152711	0	0	0	1	11	369118	369168	-
smorf153053	0	0	0	1	11	265102	265134	-
smorf153056	0	0	0	1	11	264184	264234	-
YKL106C-A	4	0	0	0	11	236791	236910	-
smorf153283	0	0	0	1	11	204388	204510	-
YKL147C	2	0	1	0	11	171556	172173	-
smorf153405	0	0	0	1	11	166597	166656	-
smorf153482	0	0	0	1	11	152866	152922	-
smorf153486	0	0	0	1	11	151756	151791	-
smorf153545	0	0	0	1	11	130261	130305	-
smorf153918	0	0	0	1	11	24784	24849	-
smorf154221	0	0	0	1	11	617187	617225	-
smorf154766	0	0	0	1	11	463044	463118	-
YKL036C	3	0	1	0	11	369171	369563	-
smorf155268	0	0	0	1	11	321678	321716	-
YKL076C	3	0	1	1	11	292482	292865	-
smorf155486	0	0	0	1	11	271245	271337	-
YKL096C-B	1	0	0	0	11	258717	258866	-
YKL097C	4	0	1	0	11	258147	258557	-
smorf155655	0	0	0	1	11	231828	231872	-
YKL115C	4	0	1	0	11	222537	222929	-
smorf155986	0	0	0	1	11	137472	137519	-
YKL165C-A	4	0	0	0	11	135795	136028	-
YKL183C-A	2	1	0	0	11	98400	98612	-
smorf156336	0	0	0	1	11	53427	53465	-
smorf156497	0	0	0	1	11	14085	14126	-
smorf156510	0	0	0	1	11	11883	11915	-
smorf156527	0	0	0	1	11	6372	6425	-
smorf156874	0	0	0	1	12	94321	94413	+
smorf156957	0	0	0	1	12	130828	130890	+

smorf157004	0	0	0	1	12	151156	151206	+
YLR041W	2	0	1	0	12	229378	229698	+
YLR112W	4	0	1	1	12	370792	371211	+
YLR140W	3	0	1	0	12	423475	423801	+
smorf158022	0	1	0	1	12	449737	449784	+
YLR156W	1	0	1	0	12	472114	472458	+
YLR157W-D	1	0	0	0	12	475765	475977	+
YLR161W	1	0	1	0	12	488998	489342	+
YLR230W	2	0	1	0	12	604576	604881	+
YLR232W	1	1	1	0	12	606832	607179	+
YLR252W	2	0	1	0	12	641959	642264	+
smorf158762	0	0	0	1	12	669211	669315	+
smorf158864	0	1	0	1	12	699886	699993	+
YLR279W	3	0	1	0	12	704311	704700	+
YLR296W	4	0	1	0	12	722980	723306	+
YLR322W	1	0	1	0	12	777628	777942	+
YLR338W	2	0	1	0	12	804346	805203	+
YLR400W	2	0	1	0	12	922063	922536	+
smorf159701	0	0	0	1	12	927889	927927	+
YLL065W	4	0	1	0	12	11726	12076	+
smorf160374	0	0	0	1	12	29666	29740	+
smorf160386	0	0	0	1	12	32294	32338	+
smorf160511	0	0	0	1	12	63968	64039	+
smorf160622	0	0	0	1	12	95348	95410	+
YLR030W	4	0	1	0	12	203291	204082	+
smorf161202	0	0	0	1	12	228680	228766	+
smorf161501	0	0	0	1	12	307319	307351	+
YLR120W-A	2	0	0	1	12	388673	388774	+
smorf161791	0	0	0	1	12	390974	391009	+
YLR124W	2	0	1	0	12	391601	391945	+
YLR125W	4	0	1	0	12	393485	393895	+
smorf161888	0	0	0	1	12	415535	415591	+
YLR157W-E	1	0	0	0	12	481874	482038	+
smorf162196	0	0	0	1	12	493616	493693	+
YLR171W	1	0	1	0	12	500735	501124	+
smorf162375	0	0	0	1	12	540770	540853	+
YLR224W	4	0	1	1	12	586466	587575	+
smorf162543	0	0	0	1	12	591434	591475	+
smorf162588	0	0	0	1	12	603926	603991	+
smorf162809	0	0	0	1	12	674309	674389	+
smorf163032	0	0	0	1	12	738173	738205	+
YLR342W-A	2	0	0	0	12	815810	815983	+
smorf164095	0	0	0	1	12	1042781	1043044	+
smorf164359	0	0	0	1	12	45864	45899	+
YLL047W	1	0	1	0	12	46671	47054	+
YLL037W	2	0	1	0	12	66561	66941	+
smorf164641	0	0	0	1	12	122001	122147	+
YLL006W-A	4	0	0	0	12	136344	136520	+
smorf164933	0	0	0	1	12	201627	201707	+
smorf165072	0	0	0	1	12	234864	234908	+
smorf165136	0	0	0	1	12	251175	251216	+
smorf165580	0	0	0	1	12	363174	363224	+
YLR111W	4	1	1	0	12	370392	370724	+
smorf165776	0	0	0	1	12	410334	410372	+
YLR159W	1	0	1	0	12	485346	485690	+
YLR169W	4	0	1	0	12	500337	500690	+
YLR184W	4	0	1	0	12	522108	522455	+
smorf166263	0	0	0	1	12	542307	542339	+
smorf166903	0	0	0	1	12	713634	713681	+
smorf166944	0	0	0	1	12	721797	721850	+
YLR315W	4	0	1	1	12	764808	765269	+
YLR349W	2	0	1	0	12	827520	828026	+
YLR365W	2	0	1	0	12	855198	855530	+
YLR366W	2	0	1	0	12	855537	855842	+
YLR379W	2	0	1	0	12	876921	877295	+
smorf167520	0	0	0	1	12	898077	898151	+
smorf167566	0	0	0	1	12	910251	910409	+
YLR402W	4	0	1	0	12	924564	925079	+
smorf168200	0	0	0	1	12	1053108	1053203	-
smorf168455	0	0	0	1	12	988047	988085	-
YLR406C-A	4	0	0	0	12	932205	932354	-
smorf168734	0	0	0	1	12	928356	928514	-
YLR374C	4	0	1	0	12	871452	871841	-

YLR358C	1	1	1	0	12	843486	844049	-
smorf169048	0	0	0	1	12	840363	840401	-
smorf169204	0	0	0	1	12	789753	789785	-
smorf169214	0	0	0	1	12	787212	787340	-
smorf169618	0	0	0	1	12	682452	682499	-
YLR269C	4	1	1	0	12	680868	681218	-
smorf169623	0	0	0	1	12	679821	679961	-
YLR264C-A	4	0	0	0	12	673830	673946	-
smorf169679	0	0	0	1	12	665391	665507	-
YLR236C	4	0	1	0	12	611796	612119	-
smorf169927	0	0	0	1	12	593007	593084	-
smorf170285	0	1	0	1	12	498450	498494	-
smorf170545	0	0	0	1	12	423759	423812	-
smorf171141	0	0	0	1	12	264075	264125	-
smorf171529	0	0	0	1	12	150936	150974	-
YLL020C	1	0	1	1	12	105555	105860	-
smorf171688	0	0	0	1	12	100479	100520	-
smorf171729	0	0	0	1	12	88224	88262	-
YLL030C	3	0	1	0	12	80355	80696	-
YLL060C	4	1	1	0	12	21138	21839	-
YLR453C	4	1	1	0	12	1041797	1042984	-
smorf172231	0	1	0	1	12	1007321	1007353	-
YLR434C	4	0	1	0	12	1006022	1006405	-
YLR428C	2	1	1	0	12	990614	990958	-
smorf172404	0	0	0	1	12	954986	955021	-
YLR416C	3	0	1	0	12	954488	954886	-
YLR412C-A	4	0	0	0	12	950264	950470	-
smorf172631	0	0	0	1	12	898826	898870	-
smorf172917	0	0	0	1	12	818330	818368	-
YLR339C	4	0	1	0	12	805784	806335	-
YLR294C	4	0	1	1	12	721703	722032	-
YLR285C-A	2	0	0	1	12	708170	708340	-
YLR265C	4	0	1	1	12	674429	675457	-
YLR255C	2	0	1	0	12	645602	645955	-
smorf173556	0	1	0	1	12	636113	636178	-
YLR222C-A	4	0	0	0	12	582008	582238	-
smorf173983	0	0	0	1	12	527960	528013	-
YLR154C	4	0	1	1	12	447983	448315	-
YLR123C	2	0	1	0	12	391079	391408	-
smorf174572	0	0	0	1	12	348899	348946	-
YLR036C	4	0	1	1	12	221522	222133	-
smorf175588	0	0	0	1	12	52589	52651	-
smorf175670	0	0	0	1	12	23024	23068	-
YLR466C-B	1	0	0	0	12	1071592	1071708	-
smorf175961	0	0	0	1	12	1025827	1025895	-
YLR437C-A	2	0	0	0	12	1012456	1012683	-
smorf176035	0	0	0	1	12	1011325	1011390	-
YLR415C	4	0	1	0	12	954256	954594	-
smorf176222	0	0	0	1	12	949435	949470	-
YLR361C-A	4	1	0	1	12	849382	849678	-
smorf176667	0	0	0	1	12	832894	832947	-
smorf176856	0	0	0	1	12	786835	786867	-
smorf176871	0	0	0	1	12	781837	781875	-
YLR311C	3	0	1	0	12	757267	757614	-
YLR302C	4	0	1	0	12	732193	732555	-
YLR282C	2	1	1	0	12	705073	705414	-
smorf177115	0	0	0	1	12	704437	704478	-
smorf177289	0	0	0	1	12	660100	660138	-
smorf177356	0	0	0	1	12	642265	642306	-
smorf177473	0	0	0	1	12	614446	614532	-
smorf177926	0	0	0	1	12	493888	493935	-
YLR149C-A	4	0	0	0	12	440371	440457	-
YLR122C	2	0	1	0	12	390955	391332	-
smorf178755	0	0	0	1	12	283648	283680	-
YLR053C	4	0	1	1	12	248101	248427	-
smorf179152	0	0	0	1	12	172069	172101	-
smorf179327	0	0	0	1	12	124924	125007	-
YLL022C	4	0	1	1	12	99043	100200	-
smorf179575	0	0	0	1	12	40906	40944	-
YLL059C	2	0	1	0	12	22474	22980	-
YML100W-A	3	0	0	0	13	70138	70311	+
smorf180020	0	0	0	1	13	97759	97815	+
smorf180091	0	0	0	1	13	115681	115731	+

smorf180218	0	0	0	1	13	148888	148932	+
smorf180285	0	0	0	1	13	167680	167718	+
YML047W-A	3	0	1	0	13	179893	180258	+
smorf180686	0	0	0	1	13	262849	262962	+
smorf180766	0	0	0	1	13	283258	283338	+
smorf180876	0	0	0	1	13	320659	320775	+
YMR031W-A	4	0	1	0	13	334708	335034	+
YMR030W-A	4	0	0	0	13	337312	337602	+
smorf181183	0	0	0	1	13	405937	405990	+
smorf181277	0	0	0	1	13	436375	436455	+
YMR105W-A	3	0	0	0	13	478063	478257	+
smorf181505	0	0	0	1	13	502246	502341	+
smorf181507	0	1	0	1	13	503092	503136	+
smorf181510	0	0	0	1	13	503740	503790	+
YMR119W-A	1	0	1	1	13	506995	507369	+
smorf181610	0	0	0	1	13	522298	522360	+
YMR173W-A	1	0	1	1	13	608896	610080	+
YMR182W-A	2	0	0	0	13	625810	625896	+
YMR230W-A	2	0	0	0	13	733267	733455	+
YMR247W-A	2	0	0	0	13	769282	769425	+
YMR251W-A	4	0	0	1	13	774751	774930	+
smorf182536	0	0	0	1	13	784516	784554	+
smorf182621	0	0	0	1	13	806725	806862	+
YMR294W-A	1	0	1	0	13	858208	858567	+
YMR315W-A	1	0	0	0	13	904285	904392	+
YMR320W	2	0	1	0	13	916744	917049	+
smorf183021	0	0	0	1	13	917518	917568	+
smorf183098	0	0	0	1	13	15152	15196	+
YML116W-A	1	0	1	1	13	37472	37774	+
smorf183424	0	0	0	1	13	95702	95758	+
smorf183502	0	0	0	1	13	121526	121702	+
smorf183999	0	0	0	1	13	253238	253300	+
YMR013W-A	4	0	0	1	13	298310	298390	+
smorf184550	0	0	0	1	13	386285	386332	+
smorf184687	0	0	0	1	13	429983	430039	+
smorf184883	0	0	0	1	13	480923	481186	+
smorf185026	0	0	0	1	13	512291	512341	+
smorf185029	0	0	0	1	13	512981	513013	+
smorf185153	0	0	0	1	13	549518	549553	+
smorf185171	0	0	0	1	13	556880	556927	+
YMR151W	2	0	1	0	13	562505	562942	+
smorf185215	0	0	0	1	13	570578	570622	+
smorf185309	0	0	0	1	13	592964	593008	+
YMR175W	4	0	0	1	13	611015	611254	+
smorf185708	0	0	0	1	13	720923	721024	+
smorf185827	0	0	0	1	13	763361	763501	+
YMR272W-B	2	0	0	0	13	811088	811195	+
smorf186240	0	0	0	1	13	872978	873037	+
smorf186241	0	0	0	1	13	873056	873103	+
smorf186383	0	0	0	1	13	912635	912697	+
smorf186489	0	0	0	1	13	13629	13661	+
YML099W-A	1	0	1	0	13	74229	74558	+
YML090W	4	0	1	0	13	90744	91130	+
smorf186771	0	0	0	1	13	97734	97769	+
YML084W	4	0	1	0	13	99489	99797	+
smorf186872	0	0	0	1	13	121647	121694	+
smorf186880	0	0	0	1	13	123057	123095	+
YML058W-A	4	0	0	1	13	158760	158966	+
smorf187191	0	0	0	1	13	202437	202481	+
smorf187362	0	0	0	1	13	258444	258476	+
YMR007W	4	0	1	0	13	279960	280340	+
smorf187944	0	0	0	1	13	413250	413339	+
smorf188038	0	0	0	1	13	434127	434159	+
smorf188121	0	0	0	1	13	462891	462938	+
smorf188253	0	0	0	1	13	501180	501236	+
smorf188255	0	0	0	1	13	502251	502355	+
YMR135W-A	3	0	1	0	13	539910	540443	+
smorf188511	0	0	0	1	13	586902	586961	+
smorf188561	0	0	0	1	13	601437	601517	+
YMR175W-A	1	0	0	0	13	611313	611507	+
YMR242W-A	4	0	0	0	13	754296	754385	+
smorf189427	0	0	0	1	13	826374	826418	+
YMR290W-A	3	0	1	0	13	851421	851768	+

smorf189556	0	0	0	1	13	864696	864734	+
smorf189571	0	0	0	1	13	867231	867269	+
smorf189707	0	0	0	1	13	915063	915107	+
YMR304C-A	4	0	1	0	13	878779	879129	-
smorf190867	0	0	0	1	13	654682	654750	-
YMR153C-A	1	0	1	0	13	565573	565908	-
YMR122C	3	0	1	0	13	510700	511074	-
smorf191843	0	0	0	1	13	390757	390804	-
YMR052C-A	2	0	1	0	13	380068	380433	-
smorf192210	0	0	0	1	13	276103	276141	-
YML007C-A	4	0	0	1	13	253162	253272	-
YML009C-A	3	0	1	0	13	250675	251001	-
smorf192363	0	1	0	1	13	226813	226860	-
YML034C-A	2	0	1	0	13	209428	209826	-
YML054C-A	3	0	0	0	13	167623	167781	-
YML094C-A	2	0	1	0	13	82219	82620	-
smorf192909	0	0	0	1	13	74089	74130	-
YMR324C	4	0	0	0	13	922200	922442	-
smorf193309	0	0	0	1	13	904389	904505	-
smorf193330	0	1	0	1	13	898449	898490	-
YMR306C-A	1	0	1	0	13	886182	886571	-
smorf193458	0	0	0	1	13	854472	854516	-
smorf193639	0	0	0	1	13	800769	800816	-
smorf193725	0	0	0	1	13	770331	770387	-
smorf193975	0	0	0	1	13	698361	698399	-
YMR194C-A	3	0	0	1	13	652911	653135	-
smorf194227	0	0	0	1	13	619098	619370	-
YMR172C-A	1	0	1	0	13	607827	608210	-
smorf194281	0	0	0	1	13	600906	600980	-
YMR141C	2	0	1	0	13	549735	550043	-
smorf194601	0	0	0	1	13	513153	513221	-
smorf194782	0	0	0	1	13	466275	466316	-
smorf194872	0	0	0	1	13	436644	436685	-
smorf194876	0	0	0	1	13	436032	436112	-
smorf194995	0	0	0	1	13	401244	401279	-
smorf195458	0	0	0	1	13	275688	275750	-
smorf195465	0	0	0	1	13	273711	273761	-
smorf195474	0	0	0	1	13	271857	271919	-
YMR001C-A	4	0	0	1	13	271347	271577	-
YML031C-A	3	0	1	0	13	214086	214421	-
YML053C	4	0	1	1	13	169116	169754	-
smorf195880	0	0	0	1	13	169035	169091	-
YML057C-A	2	0	1	0	13	160023	160412	-
smorf195909	0	0	0	1	13	159804	159854	-
YML089C	4	1	1	0	13	91041	91409	-
smorf196344	0	0	0	1	13	32562	32600	-
YMR326C	4	0	1	0	13	923492	923800	-
smorf196470	0	0	0	1	13	918107	918151	-
smorf196495	0	0	0	1	13	910655	910744	-
smorf196496	0	0	0	1	13	909962	910009	-
YMR316C-B	1	0	1	0	13	907319	907627	-
YMR316C-A	3	0	1	0	13	905660	905971	-
smorf196517	0	0	0	1	13	903881	903925	-
smorf196526	0	0	0	1	13	898709	898969	-
smorf196865	0	0	0	1	13	795773	795805	-
YMR254C	2	0	1	0	13	777614	777922	-
YMR244C-A	1	0	1	1	13	758516	758830	-
YMR193C-A	1	0	1	0	13	651071	651457	-
smorf197720	0	0	0	1	13	560441	560494	-
YMR103C	4	1	1	0	13	472901	473263	-
YMR086C-A	3	1	1	0	13	442025	442363	-
YMR082C	4	0	1	0	13	431768	432124	-
YMR057C	4	0	1	0	13	388358	388729	-
smorf198467	0	0	0	1	13	353648	353698	-
YML122C	4	0	1	0	13	26039	26419	-
smorf199706	0	0	0	1	13	9521	9553	-
YNL337W	4	0	0	0	14	7165	7419	+
YNL319W	1	0	1	0	14	38641	39081	+
YNL303W	4	0	1	0	14	61510	61857	+
smorf200685	0	0	0	1	14	263542	263577	+
smorf200959	0	0	0	1	14	338008	338064	+
smorf201010	0	0	0	1	14	356128	356235	+
smorf201104	0	0	0	1	14	380881	381012	+

smorf201180	0	0	0	1	14	418915	418953	+
YNL109W	1	1	1	0	14	418966	419511	+
YNL103W-A	2	0	0	0	14	426721	426810	+
smorf201285	0	0	0	1	14	440821	440856	+
smorf201511	0	0	0	1	14	515254	515286	+
YNL046W	4	0	1	1	14	542305	542823	+
smorf201631	0	0	0	1	14	561559	561624	+
YNL034W	4	1	1	0	14	570478	572316	+
YNL028W	3	0	1	0	14	578680	578997	+
smorf201691	0	0	0	1	14	579028	579078	+
smorf201873	0	1	0	1	14	626092	626133	+
smorf201995	0	0	0	1	14	661552	661593	+
smorf202200	0	0	0	1	14	727399	727440	+
smorf202237	0	0	0	1	14	736726	736764	+
smorf202335	0	0	0	1	14	759601	759696	+
smorf202357	0	0	0	1	14	764521	764634	+
YNL324W	2	0	1	0	14	31049	31444	+
smorf202830	0	0	0	1	14	104672	104728	+
smorf202891	0	0	0	1	14	118985	119047	+
smorf203008	0	0	0	1	14	154922	154954	+
YNL170W	2	1	1	0	14	315980	316375	+
YNL150W	2	0	1	0	14	349253	349660	+
YNL105W	1	1	1	0	14	424157	424585	+
YNL067W-A	4	0	0	0	14	498539	498685	+
YNL067W-B	3	0	0	0	14	499418	499558	+
smorf204318	0	0	0	1	14	515873	515908	+
smorf204471	0	0	0	1	14	552785	552817	+
smorf204654	0	0	0	1	14	596780	596818	+
smorf204704	0	0	0	1	14	611750	611797	+
YNR001W-A	4	0	0	0	14	631265	631483	+
smorf204777	0	0	0	1	14	632864	632905	+
smorf204784	0	0	0	1	14	633779	633883	+
smorf205082	0	0	0	1	14	720995	721081	+
smorf205120	0	0	0	1	14	730832	730870	+
smorf205177	0	0	0	1	14	743846	743938	+
smorf205222	0	1	0	1	14	755267	755332	+
smorf205454	0	0	0	1	14	28542	28613	+
smorf205494	0	0	0	1	14	42702	42734	+
YNL277W-A	2	0	0	1	14	116679	116867	+
YNL269W	2	1	1	0	14	137700	138095	+
smorf205959	0	0	0	1	14	169584	169625	+
YNL226W	2	0	1	0	14	222240	222650	+
smorf206267	0	0	0	1	14	273783	273836	+
smorf206414	0	0	0	1	14	318768	318800	+
YNL146W	4	0	1	0	14	351717	352019	+
smorf206545	0	0	0	1	14	355767	355841	+
smorf207017	0	0	0	1	14	486543	486611	+
smorf207274	0	0	0	1	14	559146	559193	+
YNL033W	4	0	1	0	14	573000	573854	+
smorf207347	0	0	0	1	14	575754	575786	+
smorf207583	0	0	0	1	14	625917	625985	+
smorf207977	0	0	0	1	14	742365	742424	+
smorf208059	0	0	0	1	14	769716	769880	+
YNR077C	4	0	0	0	14	783287	783541	-
YNR075C-A	3	0	0	0	14	781511	781603	-
smorf208363	0	0	0	1	14	711182	711283	-
smorf208382	0	0	0	1	14	706268	706318	-
YNR025C	2	0	1	0	14	672704	673063	-
YNL013C	1	0	1	0	14	609134	609511	-
smorf208825	0	0	0	1	14	579278	579316	-
smorf208994	0	0	0	1	14	529838	529879	-
smorf209360	0	0	0	1	14	429743	429805	-
smorf209499	0	0	0	1	14	394295	394351	-
smorf209635	0	0	0	1	14	351746	351796	-
YNL179C	4	0	1	1	14	300668	301105	-
YNL184C	3	0	1	1	14	292559	292885	-
smorf209878	0	0	0	1	14	275600	275656	-
YNL235C	2	0	1	0	14	209549	209980	-
smorf210154	0	0	0	1	14	201941	201976	-
smorf210247	0	0	0	1	14	175202	175267	-
smorf210540	0	0	0	1	14	82538	82612	-
smorf211072	0	0	0	1	14	727153	727206	-
smorf211767	0	0	0	1	14	553066	553119	-

smorf211865	0	0	0	1	14	525109	525219	-
smorf212302	0	0	0	1	14	393352	393399	-
YNL130C-A	2	0	0	0	14	381247	381393	-
YNL146C-A	2	1	0	0	14	351388	351582	-
smorf212521	0	0	0	1	14	337678	337737	-
smorf212537	0	0	0	1	14	332905	332958	-
smorf212548	0	0	0	1	14	330772	330807	-
YNL171C	2	0	1	0	14	315631	315999	-
smorf212745	0	0	0	1	14	267121	267237	-
smorf213405	0	0	0	1	14	68839	68895	-
smorf213553	0	0	0	1	14	17317	17373	-
smorf213831	0	0	0	1	14	727605	727685	-
smorf213874	0	0	0	1	14	715848	715886	-
smorf214123	0	0	0	1	14	643197	643235	-
YNR005C	1	0	1	0	14	636933	637337	-
smorf214239	0	0	0	1	14	610620	610652	-
YNL018C	4	1	1	0	14	599937	601775	-
YNL019C	4	1	1	0	14	598377	599231	-
smorf214478	0	0	0	1	14	545964	546017	-
smorf214540	0	0	0	1	14	531378	531422	-
smorf214718	0	0	0	1	14	480177	480236	-
smorf214739	0	0	0	1	14	473058	473141	-
smorf214763	0	0	0	1	14	466524	466589	-
YNL097C-B	2	0	0	0	14	440799	440921	-
YNL114C	1	0	1	0	14	412686	413057	-
YNL143C	3	0	1	0	14	356796	357188	-
smorf215456	0	0	0	1	14	278514	278573	-
YNL203C	2	0	1	0	14	259440	260051	-
YNL205C	2	0	1	0	14	258156	258578	-
smorf215679	0	1	0	1	14	205794	205835	-
smorf215938	0	0	0	1	14	140409	140444	-
smorf216029	0	0	0	1	14	122574	122621	-
YOL164W	4	0	1	0	15	6175	8115	+
smorf216633	0	0	0	1	15	15124	15219	+
smorf216700	0	0	0	1	15	34225	34260	+
smorf216732	0	0	0	1	15	39856	39948	+
smorf216736	0	0	0	1	15	40510	40548	+
smorf216934	0	0	0	1	15	83482	83529	+
smorf217281	0	0	0	1	15	193795	193830	+
YOL024W	4	0	1	0	15	277087	277605	+
YOL019W-A	4	0	0	0	15	288421	288573	+
YOL015W	4	1	1	0	15	297079	298839	+
smorf217642	0	0	0	1	15	300181	300225	+
smorf217734	0	0	0	1	15	338908	338976	+
smorf217837	0	0	0	1	15	371269	371337	+
smorf217898	0	0	0	1	15	385456	385488	+
YOR032W-A	4	0	0	0	15	392176	392376	+
smorf218000	0	0	0	1	15	418330	418386	+
smorf218022	0	0	0	1	15	422626	422679	+
smorf218549	0	0	0	1	15	571042	571227	+
YOR170W	3	0	1	0	15	651859	652164	+
smorf218982	0	1	0	1	15	701845	701979	+
smorf218986	0	0	0	1	15	702733	702768	+
YOR203W	4	0	1	0	15	722566	722919	+
smorf219153	0	0	0	1	15	745300	745371	+
smorf219332	0	0	0	1	15	802441	802488	+
YOR300W	3	0	1	0	15	880573	880881	+
smorf219668	0	1	0	1	15	890947	890997	+
YOR314W	2	0	1	0	15	903040	903369	+
smorf220171	0	0	0	1	15	1019176	1019259	+
smorf220257	0	0	0	1	15	1051171	1051248	+
smorf220296	0	0	0	1	15	1064626	1064727	+
YOL164W-A	1	0	0	0	15	4130	4312	+
YOL160W	2	0	1	0	15	14312	14653	+
smorf220426	0	0	0	1	15	15824	15928	+
YOL155W-A	1	0	0	0	15	27083	27217	+
YOL131W	4	0	1	0	15	73031	73357	+
smorf220732	0	0	0	1	15	96656	96823	+
YOL097W-A	4	1	0	0	15	136220	136405	+
YOL085W-A	2	0	0	0	15	161579	161791	+
smorf221195	0	0	0	1	15	225593	225868	+
smorf221545	0	0	0	1	15	315893	315937	+
smorf221651	0	0	0	1	15	337571	337654	+

smorf221684	0	0	0	1	15	348377	348418	+
YOR011W-A	1	0	0	0	15	355652	355858	+
YOR015W	3	0	1	0	15	359993	360352	+
smorf221926	0	0	0	1	15	436763	436816	+
smorf221991	0	0	0	1	15	458192	458230	+
YOR072W	3	0	1	0	15	461504	461818	+
smorf222071	0	0	0	1	15	474125	474172	+
smorf222173	0	0	0	1	15	507425	507472	+
smorf222289	0	0	0	1	15	550508	550579	+
smorf222364	0	0	0	1	15	571079	571132	+
smorf222599	0	1	0	1	15	639941	639985	+
smorf222696	0	0	0	1	15	670697	670834	+
YOR199W	4	0	1	0	15	720182	720511	+
YOR225W	3	0	1	0	15	761393	761722	+
smorf223233	0	0	0	1	15	801791	801823	+
YOR284W	4	0	1	1	15	848477	849208	+
smorf223863	0	0	0	1	15	969389	969508	+
smorf223977	0	0	0	1	15	996692	996724	+
smorf224130	0	0	0	1	15	1034753	1034785	+
YOR376W	4	0	1	0	15	1043189	1043557	+
smorf224210	0	0	0	1	15	1055285	1055353	+
YOL166W-A	4	0	0	0	15	585	740	+
smorf224394	0	0	0	1	15	9297	9359	+
smorf224467	0	0	0	1	15	28494	28571	+
smorf224866	0	0	0	1	15	138006	138104	+
smorf225242	0	0	0	1	15	242013	242066	+
smorf225378	0	0	0	1	15	281841	281966	+
YOL014W	4	0	1	0	15	299694	300068	+
smorf225454	0	0	0	1	15	304647	304718	+
YOR008W-B	4	0	0	0	15	343929	344030	+
YOR024W	4	0	1	0	15	377847	378170	+
YOR029W	4	0	1	0	15	384600	384935	+
smorf225767	0	0	0	1	15	389643	389675	+
smorf225907	0	1	0	1	15	426600	426641	+
YOR055W	1	1	1	0	15	429480	429914	+
smorf226048	0	0	0	1	15	460650	460691	+
YOR072W-A	2	0	0	0	15	461793	462041	+
smorf226155	0	0	0	1	15	487224	487256	+
smorf226179	0	0	0	1	15	490998	491054	+
smorf226854	0	0	0	1	15	664728	664784	+
smorf226870	0	1	0	1	15	667707	667787	+
YOR183W	4	0	1	0	15	678873	679262	+
YOR186W	4	0	1	0	15	683112	683546	+
smorf227106	0	0	0	1	15	746529	746597	+
YOR235W	4	0	1	0	15	779871	780185	+
YOR282W	3	0	1	0	15	846999	847319	+
smorf227497	0	0	0	1	15	874488	874538	+
YOR314W-A	4	0	0	0	15	904455	904565	+
smorf227622	0	0	0	1	15	912408	912446	+
smorf227665	0	0	0	1	15	923142	923177	+
YOR329W-A	3	0	0	0	15	939345	939554	+
smorf227828	0	0	0	1	15	978477	978605	+
smorf227923	0	0	0	1	15	1003944	1004036	+
YOR364W	2	0	1	0	15	1023369	1023737	+
smorf228080	0	0	0	1	15	1044702	1044764	+
YOR376W-A	2	0	0	0	15	1045194	1045349	+
YOR381W-A	2	0	0	0	15	1058421	1058588	+
smorf228164	0	0	0	1	15	1069140	1069190	+
YOR392W	1	0	1	0	15	1079280	1079723	+
smorf228466	0	0	0	1	15	1026604	1026654	-
YOR316C-A	3	0	0	0	15	907723	907932	-
smorf228932	0	0	0	1	15	903358	903408	-
YOR309C	4	0	1	1	15	896695	897075	-
smorf229000	0	0	0	1	15	882547	882660	-
smorf229140	0	0	0	1	15	849994	850029	-
smorf229162	0	0	0	1	15	843022	843057	-
smorf229340	0	0	0	1	15	784552	784614	-
smorf229392	0	0	0	1	15	774172	774207	-
smorf230529	0	0	0	1	15	464020	464052	-
smorf230596	0	0	0	1	15	448192	448275	-
smorf230732	0	0	0	1	15	409942	409989	-
YOR041C	1	0	1	0	15	408358	408789	-
YOR034C-A	2	0	0	0	15	397426	397668	-

smorf230970	0	0	0	1	15	333421	333453	-
smorf230999	0	0	0	1	15	326329	326433	-
smorf231228	0	0	0	1	15	265057	265125	-
YOL035C	2	0	1	0	15	258802	259104	-
smorf231564	0	0	0	1	15	167752	167823	-
smorf231856	0	0	0	1	15	97240	97332	-
smorf231923	0	0	0	1	15	73831	73902	-
YOL134C	2	0	1	0	15	70156	70545	-
smorf232045	0	0	0	1	15	40093	40191	-
YOL159C-A	4	0	0	1	15	15232	15504	-
smorf232171	0	0	0	1	15	5560	5661	-
YOL166C	1	1	1	0	15	1000	1338	-
YOR394C-A	1	0	0	0	15	1084200	1084367	-
smorf232324	0	0	0	1	15	1054914	1054961	-
smorf232413	0	0	0	1	15	1027740	1027787	-
smorf232504	0	0	0	1	15	1000944	1001027	-
smorf232623	0	0	0	1	15	969765	969893	-
YOR343C	4	0	1	0	15	968145	968471	-
YOR333C	1	0	1	0	15	944538	944954	-
smorf233368	0	0	0	1	15	741948	742100	-
smorf233449	0	0	0	1	15	724917	724958	-
smorf233524	0	0	0	1	15	701598	701690	-
YOR121C	1	0	1	0	15	551799	552104	-
smorf234039	0	0	0	1	15	550590	550652	-
smorf234271	0	0	0	1	15	494790	494840	-
YOR082C	3	0	1	0	15	479298	479639	-
YOR050C	3	0	1	0	15	424272	424619	-
YOR008C-A	1	0	0	0	15	342858	343082	-
smorf234987	0	0	0	1	15	304932	304970	-
smorf235012	0	1	0	1	15	298989	299063	-
YOL037C	1	0	1	0	15	256665	257018	-
YOL038C-A	1	0	0	1	15	254925	255020	-
YOL085C	4	0	1	0	15	161673	162014	-
smorf235531	0	0	0	1	15	160929	161006	-
smorf235828	0	0	0	1	15	78216	78311	-
YOL150C	1	1	1	0	15	44472	44783	-
smorf235955	0	0	0	1	15	43344	43385	-
smorf235979	0	0	0	1	15	39162	39242	-
YOL159C	4	0	1	1	15	17280	17795	-
smorf236095	0	0	0	1	15	8532	8612	-
smorf236316	0	0	0	1	15	1045904	1045936	-
smorf236554	0	0	0	1	15	981368	981424	-
smorf236614	0	0	0	1	15	967928	967975	-
YOR331C	4	0	1	0	15	943562	944119	-
smorf237052	0	0	0	1	15	853622	853825	-
YOR263C	2	0	1	0	15	818756	819163	-
smorf237380	0	0	0	1	15	769847	769912	-
smorf237666	0	0	0	1	15	689342	689395	-
smorf237724	0	0	0	1	15	675311	675358	-
smorf237749	0	0	0	1	15	665465	665506	-
smorf237769	0	0	0	1	15	661994	662104	-
YOR169C	2	0	1	0	15	651377	651841	-
YOR161C-C	1	0	0	0	15	639122	639268	-
YOR135C	1	1	1	0	15	580160	580501	-
smorf238076	0	0	0	1	15	579539	579688	-
smorf238083	0	0	0	1	15	577832	577933	-
smorf238249	0	1	0	1	15	524996	525040	-
smorf238258	0	0	0	1	15	522596	522640	-
smorf238683	0	0	0	1	15	367085	367135	-
smorf238732	0	0	0	1	15	355649	355681	-
smorf238857	0	0	0	1	15	324881	325009	-
YOL052C-A	4	1	0	1	15	231569	231754	-
smorf239229	0	0	0	1	15	220523	220555	-
smorf239636	0	0	0	1	15	106268	106360	-
YOL118C	3	0	1	0	15	96608	96916	-
smorf239753	0	0	0	1	15	72719	72754	-
smorf239890	0	0	0	1	15	39662	39718	-
smorf239906	0	0	0	1	15	35753	35848	-
smorf239983	0	0	0	1	15	15989	16027	-
smorf240109	0	0	0	1	16	20197	20271	+
smorf240134	0	0	0	1	16	26107	26145	+
smorf240184	0	0	0	1	16	44470	44526	+
smorf240312	0	0	0	1	16	79636	79677	+

smorf240700	0	0	0	1	16	192928	192990	+
smorf240717	0	0	0	1	16	197815	197874	+
YPL152W-A	1	0	0	1	16	264601	264699	+
smorf241370	0	0	0	1	16	378973	379131	+
smorf241479	0	0	0	1	16	418384	418446	+
smorf241515	0	0	0	1	16	425221	425274	+
smorf241754	0	0	0	1	16	486409	486471	+
YPL027W	4	0	1	0	16	499663	500400	+
YPR087W	1	0	1	0	16	711352	711672	+
smorf242717	0	0	0	1	16	777577	777669	+
YPR150W	1	0	1	0	16	830995	831516	+
smorf243001	0	0	0	1	16	856555	856599	+
smorf243045	0	0	0	1	16	870289	870333	+
smorf243278	0	0	0	1	16	924220	924276	+
smorf243306	0	0	0	1	16	929128	929220	+
smorf243412	0	0	0	1	16	12791	12853	+
smorf243573	0	0	0	1	16	53045	53098	+
smorf243624	0	0	0	1	16	62711	62752	+
YPL251W	1	0	1	0	16	73625	73927	+
smorf243696	0	0	0	1	16	81491	81526	+
smorf243709	0	0	0	1	16	85394	85429	+
smorf243988	0	0	0	1	16	169730	169765	+
smorf244305	0	0	0	1	16	261488	261541	+
smorf244406	0	0	0	1	16	286583	286765	+
YPL124W	4	0	1	1	16	316754	317515	+
smorf244674	0	0	0	1	16	352655	352696	+
smorf244856	0	0	0	1	16	398246	398284	+
smorf245008	0	1	0	1	16	444017	444049	+
smorf245086	0	0	0	1	16	462233	462313	+
YPL038W-A	1	0	0	0	16	480179	480370	+
smorf245430	0	0	0	1	16	544052	544102	+
smorf245439	0	0	0	1	16	553472	553504	+
smorf245509	0	0	0	1	16	566327	566377	+
YPR012W	2	0	0	0	16	584306	584560	+
YPR016W-A	4	0	0	0	16	593093	593353	+
YPR039W	2	0	1	0	16	647009	647344	+
smorf246058	0	0	0	1	16	729140	729175	+
smorf246523	0	0	0	1	16	855764	855799	+
YPL257W	4	0	1	1	16	63279	63860	+
smorf247096	0	0	0	1	16	74160	74219	+
smorf247301	0	0	0	1	16	128523	128555	+
YPL200W	4	0	1	0	16	171483	171953	+
smorf247515	0	0	0	1	16	183852	183974	+
YPL185W	3	0	1	1	16	195252	195647	+
smorf247562	0	0	0	1	16	197934	197978	+
smorf247637	0	0	0	1	16	212886	212927	+
smorf247944	0	0	0	1	16	286818	286874	+
smorf248031	0	0	0	1	16	308655	308705	+
YPL062W	4	0	1	0	16	431892	432296	+
smorf248735	0	1	0	1	16	519324	519392	+
YPR064W	4	0	1	0	16	678948	679367	+
YPR092W	2	0	1	0	16	718377	718682	+
smorf249651	0	0	0	1	16	770037	770132	+
smorf249825	0	0	0	1	16	812850	812924	+
smorf250197	0	0	0	1	16	917322	917360	+
smorf250291	0	0	0	1	16	941553	941594	+
smorf250357	0	0	0	1	16	936834	936875	-
YPR197C	2	0	1	0	16	933894	934457	-
smorf250518	0	0	0	1	16	886443	886481	-
smorf250532	0	0	0	1	16	882663	882698	-
YPR151C	4	1	1	0	16	831051	831671	-
smorf250859	0	0	0	1	16	787503	787550	-
smorf251333	0	0	0	1	16	658836	658889	-
smorf251485	0	0	0	1	16	619887	619937	-
smorf251598	0	0	0	1	16	589878	589922	-
smorf251722	0	0	0	1	16	556722	556814	-
smorf252105	0	0	0	1	16	444108	444245	-
smorf252189	0	0	0	1	16	415392	415430	-
smorf252373	0	0	0	1	16	367542	367577	-
YPL102C	4	0	1	0	16	360000	360302	-
smorf252640	0	0	0	1	16	297267	297338	-
smorf252930	0	1	0	1	16	214641	214721	-
smorf253025	0	0	0	1	16	188919	188960	-

YPL197C	2	0	1	0	16	174342	174755	-
smorf253145	0	0	0	1	16	146454	146504	-
smorf253489	0	0	0	1	16	55893	55961	-
YPL261C	3	0	1	0	16	48996	49304	-
smorf253532	0	0	0	1	16	47091	47204	-
smorf253760	0	0	0	1	16	937265	937297	-
smorf253795	0	0	0	1	16	930413	930448	-
smorf254143	0	0	0	1	16	844223	844354	-
smorf254186	0	0	0	1	16	830294	830422	-
smorf254193	0	0	0	1	16	828557	828595	-
YPR142C	4	0	1	0	16	818126	818689	-
YPR130C	2	0	1	0	16	793370	793777	-
YPR123C	2	1	1	0	16	786137	786571	-
smorf254341	0	0	0	1	16	781517	781588	-
smorf254383	0	0	0	1	16	770441	770473	-
smorf254393	0	0	0	1	16	769043	769078	-
smorf254486	0	0	0	1	16	733247	733291	-
smorf254705	0	0	0	1	16	679436	679468	-
YPR014C	4	0	1	0	16	587186	587515	-
smorf255122	0	0	0	1	16	557279	557380	-
YPL080C	2	0	1	0	16	406169	406495	-
YPL119C-A	2	0	0	0	16	324023	324286	-
smorf256039	0	1	0	1	16	301286	301345	-
smorf256321	0	0	0	1	16	209951	209983	-
smorf256387	0	0	0	1	16	198770	198811	-
smorf256577	0	0	0	1	16	146108	146143	-
YPL250C	4	0	1	1	16	74309	74719	-
smorf257007	0	0	0	1	16	21449	21544	-
smorf257115	0	0	0	1	16	940993	941040	-
YPR195C	2	1	1	0	16	927961	928290	-
smorf257187	0	0	0	1	16	923872	923931	-
YPR170C	4	0	1	0	16	882979	883314	-
YPR146C	4	0	1	1	16	825343	825672	-
YPR145C-A	4	0	0	1	16	824686	824922	-
smorf257693	0	0	0	1	16	789484	789525	-
YPR126C	1	0	1	0	16	789073	789381	-
YPR096C	4	0	1	0	16	724840	725142	-
YPR053C	4	0	1	1	16	665785	666240	-
smorf258193	0	0	0	1	16	657043	657123	-
smorf258247	0	0	0	1	16	646207	646254	-
YPR027C	4	1	1	0	16	620422	621255	-
YPL025C	4	0	1	0	16	502471	503028	-
smorf258801	0	0	0	1	16	486076	486147	-
YPL056C	4	0	1	0	16	453427	453732	-
smorf258999	0	0	0	1	16	431485	431520	-
YPL182C	3	1	1	0	16	203305	203688	-
smorf259922	0	0	0	1	16	175945	175998	-
YPL205C	4	0	1	0	16	163921	164265	-
smorf260060	0	0	0	1	16	145570	145635	-
smorf260100	0	0	0	1	16	138322	138363	-
smorf260204	0	0	0	1	16	105847	105891	-
YBR090C	4	0	0	1	2	426327	427052	-
YBR109W-A	2	0	0	1	2	458602	458826	+
YDL069C	4	0	0	1	4	333121	333810	-
YDR535C	3	0	0	0	4	1506597	1507353	-
YER014C-A	4	0	0	0	5	183730	184699	-
YER044C-A	4	0	0	0	5	238459	239773	-
YHR199C-A	4	0	0	1	8	498571	498859	-
YJL189W	2	0	0	1	10	75932	76473	+
YJL052C-A	4	0	0	0	10	337879	337998	-
YJL047C-A	4	0	0	0	10	349039	349173	-
YJR079W	3	0	0	0	10	580198	581232	+
YKL065W-A	4	0	0	0	11	315598	315819	+
YLR202C	4	0	0	0	12	550196	550638	-
YOR031W	4	0	0	0	15	389213	389422	+
YOR103C	3	0	0	1	15	516450	516842	-
YOR293C-A	2	0	0	0	15	867997	868146	-
YOR318C	3	0	0	0	15	911781	912433	-
YPR074W-A	4	0	0	0	16	695015	695185	+

Supplementary Table 3. ORFs meeting the proto-gene designation. ORF name: systematic name from SGD for $ORFs_{1-4}$ and internally generated name for $ORFs_0$; these internally generated names do not bear any specific meaning. Conservation level: estimation of the relative time elapsed since emergence of the ORF in a range between 0 (most recent) and 4 (most ancient here; the entire range goes to 10) (Supplementary Information). Retained by natural selection: indicates whether the ORF was under significant intra-species natural selection (1) or not (0) (Supplementary Information). Length greater or equal to 300 nucleotides: indicates whether the ORF is longer (1) or shorter (0) than the threshold of 300 nucleotides traditionally used for delineating genes from non-genic ORFs in *S. cerevisiae*. With translation signatures: indicates whether the ORF is translated according to our pipeline (Supplementary Information). Coor1, Coor2: inferior and superior coordinates of the ORF.

Figure	Variable 1	Variable 2	ORF group in figure	Kendall's *tau* in figure	Kendall's *tau* in bootstraps	Kendall's *tau* for $ORFs_{5-10}$
2a	conservation level	length	$ORFs_{0-10}$	0.31	0.55 ± 0.02	0.2
2a	conservation level	expression level (average number of RNAseq reads in rich conditions)	$ORFs_{0-10}$	0.28	0.41 ± 0.02	0.1
2b	conservation level	codon adaptation index	$ORFs_{0-10}$	0.12	0.28 ± 0.02	0.19
3e	conservation level	significant intra-species purifying selection	$ORFs_0^+$ and $ORFs_{1-10}$	0.45	0.39 ± 0.03	0.2

Supplementary Table 4. Controls for correlation statistics. For correlation statistics presented in Fig. 2 and Fig. 3, bootstrap simulations were performed whereby only 50 ORFs per conservation level were sampled 100 times in order to control for the large number of $ORFs_0$. Correlation statistics were also calculated for the group $ORFs_{5-10}$ only. For all these correlations, $P < 10^{-14}$.

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