

GEPHE SUMMARY

COX18 (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=%COX18%#gephebase-summary-title)	Gephebase Gene	GP00001708	Gepheid
Published	Entry Status	Noor	Main curator

PHENOTYPIC CHANGE

Trait Category			
Physiology (https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title)	Trait		
Low-glucose adaptation (experimental evolution) (https://www.gephebase.org/search-criteria/?and+Trait=%Low-glucose+adaptation+(experimental+evolution)%#gephebase-summary-title)	Trait State in Taxon A		
Saccharomyces cerevisiae	Trait State in Taxon B		
Saccharomyces cerevisiae	Ancestral State		
Taxon A	Taxonomic Status		
Experimental Evolution (https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Experimental+Evolution%#gephebase-summary-title)			
Taxon A		Taxon B	
Saccharomyces cerevisiae (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Saccharomyces+cerevisiae%#gephebase-summary-title)	Latin Name	Saccharomyces cerevisiae (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Saccharomyces+cerevisiae%#gephebase-summary-title)	Latin Name
baker's yeast	Common Name	baker's yeast	Common Name
Saccharomyces capensis; Saccharomyces italicus; Saccharomyces oviformis; Saccharomyces uvarum var. melibiosus; baker's yeast; S. cerevisiae; brewer's yeast; ATCC 18824; ATCC:18824; CBS 1171; CBS:1171; NRRL Y-12632; NRRL:Y-12632; Saccaromyces cerevisiae; Saccharomyce cerevisiae; Saccharomyces cerevisiae; Sccharomyces cerevisiae	Synonyms	Saccharomyces capensis; Saccharomyces italicus; Saccharomyces oviformis; Saccharomyces uvarum var. melibiosus; baker's yeast; S. cerevisiae; brewer's yeast; ATCC 18824; ATCC:18824; CBS 1171; CBS:1171; NRRL Y-12632; NRRL:Y-12632; Saccaromyces cerevisiae; Saccharomyce cerevisiae; Saccharomyces cerevisiae; Sccharomyces cerevisiae	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Ascomycota; saccharomyceta; Saccharomycotina; Saccharomycetes; Saccharomycetales; Saccharomycetaceae; Saccharomyces	Lineage	cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Ascomycota; saccharomyceta; Saccharomycotina; Saccharomycetes; Saccharomycetales; Saccharomycetaceae; Saccharomyces	Lineage
Saccharomyces () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4930)	Parent	Saccharomyces () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4930)	Parent
4932 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4932)	NCBI Taxonomy ID	4932 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4932)	NCBI Taxonomy ID
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
No		No	

GENOTYPIC CHANGE

COX18	Generic Gene Name	UniProtKB Saccharomyces cerevisiae (strain ATCC 204508 / S288c) P53239 (http://www.uniprot.org/uniprot/P53239)
OXA2; YGR062C; G4532	Synonyms	GenebankID or UniProtKB
4932.YGR062C (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 4932.YGR062C)	String	0
Belongs to the OXA1/ALB3/YidC family.	Sequence Similarities	
GO:0032977 : membrane insertase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0032977)	GO - Molecular Function	GO - Biological Process
GO:0032979 : protein insertion into mitochondrial inner membrane from matrix side (https://www.ebi.ac.uk/QuickGO/term/GO:0032979)		

GO - Cellular Component

GO:0031305 : integral component of mitochondrial inner membrane
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0031305>)

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^No^#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Coding^#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=^SNP^#gephebase-summary-title>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Leu59His (T>A at position 617107 according to Table 1) - CTY to CAY position 617107

Experimental Evidence

Association Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Association+Mapping^#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	-	-	617107
Amino-acid	Leu	His	59

Main Reference

Molecular characterization of clonal interference during adaptive evolution in asexual populations of *Saccharomyces cerevisiae*. (2008) (<https://pubmed.ncbi.nlm.nih.gov/19029899>)

Authors

Kao KC; Sherlock G

Abstract

The classical model of adaptive evolution in an asexual population postulates that each adaptive clone is derived from the one preceding it. However, experimental evidence has suggested more complex dynamics, with theory predicting the fixation probability of a beneficial mutation as dependent on the mutation rate, population size and the mutation's selection coefficient. Clonal interference has been demonstrated in viruses and bacteria but not in a eukaryote, and a detailed molecular characterization is lacking. Here we use three different fluorescent markers to visualize the dynamics of asexually evolving yeast populations. For each adaptive clone within one of our evolving populations, we identified the underlying mutations, monitored their population frequencies and used microarrays to characterize changes in the transcriptome. These results represent the most detailed molecular characterization of experimental evolution to date and provide direct experimental evidence supporting both the clonal interference and the multiple mutation models.

Additional References

Reciprocal sign epistasis between frequently experimentally evolved adaptive mutations causes a rugged fitness landscape. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21552329>)

RELATED GEPHE

Related Genes

12 (HXT6/7, IRA1, MDS3, MKT1, MNN4, MTH1, MUK1, RAS1, RAS2, RIM15, SLY41, TAF5) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^4932^/and+Trait=Low-glucose+adaptation/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS