

GEPHE SUMMARY

TAC1 ( <a href="https://www.gephebase.org/search-criteria?/and+GeneGephebase=TAC1#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+GeneGephebase=TAC1#gephebase-summary-title</a> )	Gephebase Gene	GP00001090	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+TraitCategory=Physiology#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+TraitCategory=Physiology#gephebase-summary-title</a> )	Trait Category		
Xenobiotic resistance (drug) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic%20resistance%20(drug)#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic resistance (drug)#gephebase-summary-title</a> )	Trait		
Candida albicans- drug sensitive	Trait State in Taxon A		
Candida albicans- drug resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=Intraspecific#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=Intraspecific#gephebase-summary-title</a> )	Taxonomic Status		

Taxon A		Taxon B	
	Latin Name		Latin Name
Candida albicans ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon%20and%20Synonyms=Candida%20albicans#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Candida albicans#gephebase-summary-title</a> )	Candida albicans	Candida albicans ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon%20and%20Synonyms=Candida%20albicans#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Candida albicans#gephebase-summary-title</a> )	Candida albicans
-	Common Name	-	Common Name
	Synonyms		Synonyms
Candida stellatoidea; Candida stellatoidea type I; ATCC 11006; ATCC 18804; ATCC 20308; ATCC:11006; ATCC:18804; ATCC:20308; BCC 5390; BCC:5390; BCRC 20512; BCRC:20512; CBS 562; CBS:562; CCRC 20512; CCRC:20512; CECT 1002; CECT:1002; IFO 1385; IFO:1385; JCM 1537; JCM 1542; JCM:1537; JCM:1542; KCTC 7270; KCTC:7270; MUCL 29800; MUCL:29800; NBIMCC 72; NBIMCC:72; NBRC 1385; NBRC:1385; NCAIM Y.00971; NCYC 597; NCYC:597; NRRL Y-12983; NRRL:Y:12983; PYCC 3436; PYCC:3436; UAMH 8765; UAMH:8765; Candida albican		Candida stellatoidea; Candida stellatoidea type I; ATCC 11006; ATCC 18804; ATCC 20308; ATCC:11006; ATCC:18804; ATCC:20308; BCC 5390; BCC:5390; BCRC 20512; BCRC:20512; CBS 562; CBS:562; CCRC 20512; CCRC:20512; CECT 1002; CECT:1002; IFO 1385; IFO:1385; JCM 1537; JCM 1542; JCM:1537; JCM:1542; KCTC 7270; KCTC:7270; MUCL 29800; MUCL:29800; NBIMCC 72; NBIMCC:72; NBRC 1385; NBRC:1385; NCAIM Y.00971; NCYC 597; NCYC:597; NRRL Y-12983; NRRL:Y:12983; PYCC 3436; PYCC:3436; UAMH 8765; UAMH:8765; Candida albican	
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Ascomycota; saccharomyceta; Saccharomycotina; Saccharomycetes; Saccharomycetales; Debaryomycetaceae; Candida/Lodderomyces clade; Candida	Lineage	cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Ascomycota; saccharomyceta; Saccharomycotina; Saccharomycetes; Saccharomycetales; Debaryomycetaceae; Candida/Lodderomyces clade; Candida	Lineage
Candida () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1535326">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1535326</a> )	Parent	Candida () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1535326">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1535326</a> )	Parent
5476 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5476">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5476</a> )	NCBI Taxonomy ID	5476 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5476">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=5476</a> )	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

TAC1	Generic Gene Name	A7IZW4 ( <a href="http://www.uniprot.org/uniprot/A7IZW4">http://www.uniprot.org/uniprot/A7IZW4</a> )	UniProtKB Candida albicans
TAC1-13; TAC1-19; TAC1-23	Synonyms	EU054342 ( <a href="https://www.ncbi.nlm.nih.gov/nucleotide/EU054342">https://www.ncbi.nlm.nih.gov/nucleotide/EU054342</a> )	GenebankID or UniProtKB
-	String		
-	Sequence Similarities		
	GO - Molecular Function		
GO:0008270 : zinc ion binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008270">https://www.ebi.ac.uk/QuickGO/term/GO:0008270</a> )			
GO:0003677 : DNA binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003677">https://www.ebi.ac.uk/QuickGO/term/GO:0003677</a> )			
GO:0000981 : DNA-binding transcription factor activity, RNA polymerase II-specific ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0000981">https://www.ebi.ac.uk/QuickGO/term/GO:0000981</a> )			

GO:0006351 : transcription, DNA-templated  
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0006351>)

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

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

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

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

Nonsynonymous

N977D

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

Presumptive Null

Molecular Type

Aberration Type

SNP Coding Change

Molecular Details of the Mutation

Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

A mutation in Tac1p, a transcription factor regulating CDR1 and CDR2, is coupled with loss of heterozygosity at chromosome 5 to mediate antifungal resistance in *Candida albicans*. (2006)  
 (<https://pubmed.ncbi.nlm.nih.gov/16452151>)

Authors

Coste A; Turner V; Ischer F; Morschhäuser J; Forche A; Selmecki A; Berman J; Bille J; Sanglard D

Abstract

TAC1, a *Candida albicans* transcription factor situated near the mating-type locus on chromosome 5, is necessary for the upregulation of the ABC-transporter genes CDR1 and CDR2, which mediate azole resistance. We showed previously the existence of both wild-type and hyperactive TAC1 alleles. Wild-type alleles mediate upregulation of CDR1 and CDR2 upon exposure to inducers such as fluconazole, while hyperactive alleles result in constitutive high expression of CDR1 and CDR2. Here we recovered TAC1 alleles from two pairs of matched azole-susceptible (DSY294; FH1: heterozygous at mating-type locus) and azole-resistant isolates (DSY296; FH3: homozygous at mating-type locus). Two different TAC1 wild-type alleles were recovered from DSY294 (TAC1-3 and TAC1-4) while a single hyperactive allele (TAC1-5) was isolated from DSY296. A single amino acid (aa) difference between TAC1-4 and TAC1-5 (Asn977 to Asp or N977D) was observed in a region corresponding to the predicted activation domain of Tac1p. Two TAC1 alleles were recovered from FH1 (TAC1-6 and TAC1-7) and a single hyperactive allele (TAC1-7) was recovered from FH3. The N977D change was seen in TAC1-7 in addition to several other aa differences. The importance of N977D in conferring hyperactivity to TAC1 was confirmed by site-directed mutagenesis. Both hyperactive alleles TAC1-5 and TAC1-7 were codominant with wild-type alleles and conferred hyperactive phenotypes only when homozygous. The mechanisms by which hyperactive alleles become homozygous was addressed by comparative genome hybridization and single nucleotide polymorphism arrays and indicated that loss of TAC1 heterozygosity can occur by recombination between portions of chromosome 5 or by chromosome 5 duplication.

Additional References

## RELATED GEPHE

Related Genes

1 (ERG11 = CYP51A1) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^5476^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

6 (<https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^TAC1^/and+Taxon ID=^5476^/or+Gene Gephebase=^TAC1^/and+Taxon ID=^5476^#gephebase-summary-title>)

## EXTERNAL LINKS

## COMMENTS