

GEPHE SUMMARY

	Gephebase Gene	GephelD
cytochrome b (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="cytochrome b">#gephebase-summary-title)	GP00002045	Main curator
	Entry Status	Courtier
Published		

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category="Physiology">#gephebase-summary-title)	Trait		
Xenobiotic resistance (fungicide; Qol; quinone outside inhibiting) (https://www.gephebase.org/search-criteria?/and+Trait=Xenobiotic+resistance+(fungicide; Qol; quinone outside inhibiting)#gephebase-summary-title)	Trait State in Taxon A		
sensitive	Trait State in Taxon B		
resistant to its own toxin	Ancestral State		
Taxon A	Taxonomic Status		
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Interspecific">#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Mycena viridimarginata (#gephebase-summary-title)	Strobilurus tenacellus (#gephebase-summary-title)		
-	Common Name		Common Name
-	Synonyms		Synonyms
-	Rank		Rank
species	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae; Agaricales; Mycenaceae; Mycena	cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae; Agaricales; Physalaciaceae; Strobilurus		
	Parent		Parent
Mycena () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=41247)	Strobilurus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=41250)		
41249 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=41249)	NCBI Taxonomy ID		NCBI Taxonomy ID
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Homo sapiens
UQCRLS1	P47985 (http://www.uniprot.org/uniprot/P47985)	
RIP1; RIS1; RISP; UQCRLS1	Synonyms	GenebankID or UniProtKB
9606.ENSP00000306397 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000306397)	0	
	String	
	Sequence Similarities	
	GO - Molecular Function	
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)		
GO:0051537 : 2 iron, 2 sulfur cluster binding (https://www.ebi.ac.uk/QuickGO/term/GO:0051537)		
GO:0008121 : ubiquinol-cytochrome-c reductase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008121)		
	GO - Biological Process	
GO:0006122 : mitochondrial electron transport, ubiquinol to cytochrome c		

GO:0016021 : integral component of membrane

(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)

GO:0005739 : mitochondrial (https://www.ebi.ac.uk/QuickGO/term/GO:0005739)

GO:0005743 : mitochondrial inner membrane

(https://www.ebi.ac.uk/QuickGO/term/GO:0005743)

GO:0005751 : mitochondrial respiratory chain complex IV

(https://www.ebi.ac.uk/QuickGO/term/GO:0005751)

GO:0005750 : mitochondrial respiratory chain complex III

(https://www.ebi.ac.uk/QuickGO/term/GO:0005750)

Mutation #1

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)	Molecular Type
SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=^SNP^#gephebase-summary-title)	Aberration Type
Nonsynonymous	SNP Coding Change
Ser254Gln	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)	Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Ser	Gln	254

Main Reference

The molecular basis for the natural resistance of the cytochrome bc1 complex from strobilurin-producing basidiomycetes to center Qp inhibitors. (1996)

(https://pubmed.ncbi.nlm.nih.gov/8631367)

Authors

Kraiczy P; Haase U; Gencic S; Flindt S; Anke T; Brandt U; Von Jagow G

Abstract

Mitochondria from the strobilurin A producing basidiomycetes *Strobilurus tenacellus* and *Mycena galopoda* exhibit natural resistance to (E)-beta-methoxyacrylate inhibitors of the ubiquinol oxidation center (center Qp) of the cytochrome bc1 complex. Isolated cytochrome bc1 complex from *S. tenacellus* was found to be highly similar to that of *Saccharomyces cerevisiae* with respect to subunit composition, as well as spectral characteristics and midpoint potentials of the heme centers. To understand the molecular basis of natural resistance, we determined the exon/intron organization and deduced the sequences of cytochromes b from *S. tenacellus*, *M. galopoda* and a third basidiomycete, *Mycena viridimarginata*, which produces no strobilurin A. Comparative sequence analysis of two regions of cytochrome b known to contribute to the formation of center Qp suggested that the generally lower sensitivity of all three basidiomycetes was due to the replacement of a small amino acid residue in position 127 by isoleucine. For *M. galopoda* replacement of Gly143 by alanine and Gly153 by serine, for *S. tenacellus* replacement of a small residue in position 254 by glutamine and Asn261 by aspartate was found to be the likely causes for resistance to (E)-beta-methoxyacrylates. The latter exchange is also found in *Schizosaccharomyces pombe*, which we found also to be naturally resistant to (E)-beta-methoxyacrylates.

Additional References

Mutation #2

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)	Molecular Type
SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=^SNP^#gephebase-summary-title)	Aberration Type
Nonsynonymous	SNP Coding Change
N261D	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)	Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Asn	Asp	261

Main Reference

The molecular basis for the natural resistance of the cytochrome bc1 complex from strobilurin-producing basidiomycetes to center Qp inhibitors. (1996)

(https://pubmed.ncbi.nlm.nih.gov/8631367)

Authors

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[Additional References](#)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (<https://www.gephebase.org/search-criteria?/or+Gene Gephebase=%cytochrome b%/and+Taxon ID=%41249%/or+Gene Gephebase=%cytochrome b%/and+Taxon ID=%41251%#gephebase-summary-title>)

EXTERNAL LINKS

COMMENTS

@MitochondrialGene @SeveralMutationsWithEffect - The Asn261Asp mutation has been found in other resistant taxa.