GEPHE SUMMARY

Gephebase Gene
cytochrome b (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^cytochrome b^#gephebase-summary-title)

GepheID
GP00002044

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Xenobiotic resistance (fungicide; QoI; quinone outside inhibiting) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (fungicide; QoI; quinone outside inhibiting)^#gephebase-summary-title)

Trait State in Taxon A
sensitive

Trait State in Taxon B
resistant to its own toxin and to myxothiazol and (E)-p-methoxyacrylate-stilben

Ancestral State
Taxon A

Taxonomic Status
Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Interspecific^#gephebase-summary-title)

Taxon A

Latin Name
Mycena viridimarginata (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Mycena viridimarginata^#gephebase-summary-title)

Common Name
-

Synonyms
-

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae; Agaricales; Mycenaceae; Mycena

Parent
Mycena () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 41247)

NCBI Taxonomy ID
41249 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 41249)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Mycena galopus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Mycena galopus^#gephebase-summary-title)

Common Name
-

Synonyms
Mycena galopoda

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Fungi; Dikarya; Basidiomycota; Agaricomycotina; Agaricomycetes; Agaricomycetidae; Agaricales; Mycenaceae; Mycena

Parent
Mycena () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 41247)

NCBI Taxonomy ID
41248 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 41248)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
UQCRFS1

Synonyms
RIP1; RIS1; RISP; UQCR5

String
9606.ENSP00000306397 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000306397)

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 (https://www.ebi.ac.uk/QuickGO/term/GO:0006122)

UniProtKB Homo sapiens
P47985 (http://www.uniprot.org/uniprot/P47985)

GenebankID or UniProtKB
()

GO - Cellular Component

GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005739 : mitochondrion (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

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

Gly143Ala

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

	Taxon A	Taxon B	Position
Codon	GGN	GCN	-
Amino-acid	Gly	Ala	143

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

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

Ala153Ser

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Ala	Ser	153

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=^41248^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

@MitochondrialGene @SeveralMutationsWithEffect - The two mutations have been found in other resistant taxa.