

GEPHE SUMMARY

ref(2)P (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^ref(2)P^#gephebase-summary-title)	Gephebase Gene	GP00001995	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title)	Trait Category		
Pathogen resistance (sigma virus) (https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen+resistance+(sigma+virus)^#gephebase-summary-title)	Trait		
susceptible - O (Oregon) allele	Trait State in Taxon A		
resistant - P (Paris) allele	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)	Latin Name	Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)	Latin Name
fruit fly	Common Name	fruit fly	Common Name
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms	Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydroidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	Lineage
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	Parent	melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351)	Parent
7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID	7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

ref(2)P	Generic Gene Name	P14199 (http://www.uniprot.org/uniprot/P14199)	UniProtKB Drosophila melanogaster
CG10360; Dmel\CG10360; dP62; p62; p62/Ref(2)P; p63; ref; ref(2)p; Ref(2)p; Ref(2)P; Ref(2)P/p62; ref(2)Pn; ref(2)Po2; Ref2; ref2p; Ref2p; Ref2P; SQSTM1	Synonyms	()	GenebankID or UniProtKB
7227.FBpp0080794 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0080794)	String		
-	Sequence Similarities		
GO:0008270 : zinc ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008270)	GO - Molecular Function		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)			
GO:0070530 : K63-linked polyubiquitin modification-dependent protein binding			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0070530>)
GO:0005080 : protein kinase C binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005080>)

GO - Biological Process

GO:0007005 : mitochondrion organization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007005>)
GO:0035973 : aggrephagy (<https://www.ebi.ac.uk/QuickGO/term/GO:0035973>)
GO:0007032 : endosome organization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007032>)
GO:0000423 : mitophagy (<https://www.ebi.ac.uk/QuickGO/term/GO:0000423>)
GO:0061912 : selective autophagy (<https://www.ebi.ac.uk/QuickGO/term/GO:0061912>)
GO:0030382 : sperm mitochondrion organization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030382>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0005776 : autophagosome (<https://www.ebi.ac.uk/QuickGO/term/GO:0005776>)
GO:0016235 : aggresome (<https://www.ebi.ac.uk/QuickGO/term/GO:0016235>)
GO:0044753 : amphisome (<https://www.ebi.ac.uk/QuickGO/term/GO:0044753>)

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

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

Molecular Details of the Mutation

Several differences (SNP and indels) are detected between permissive ref(2)Po and restrictive ref(2)Pp strains. Exact causing mutation(s) unknown.

Experimental Evidence

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

Main Reference

Unusual variability of the *Drosophila melanogaster* ref(2)P protein which controls the multiplication of sigma rhabdovirus. (1993) (<https://pubmed.ncbi.nlm.nih.gov/8462852>)

Authors

Dru P; Bras F; DezÃ© S; Gay P; Petitjean AM; Pierre-Deneubourg A; Teninges D; Contamine D

Abstract

The ref(2)P gene of *Drosophila melanogaster* was identified by the discovery of two alleles, Po and Pp, respectively, permissive and restrictive for sigma rhabdovirus multiplication. A surprising variability of this gene was first noticed by the observation of size differences between the transcripts of permissive and restrictive alleles. In this paper, another restrictive allele, Pn, clearly distinct from Pp, is described: it exhibits a weaker antiviral effect than Pp and differs from Pp by its molecular structure. Five types of alleles were distinguished on the basis of their molecular structure, as revealed by S1 nuclease analysis of 17 *D. melanogaster* strains; three alleles were permissive and two restrictive. Comparison of the sequences of four haplotypes revealed numerous point mutations, two deletions (21 and 24 bp) and a complex event involving a 3-bp deletion, all affected the coding region. The unusual variability of the ref(2)P locus was confirmed by the high ratio of amino acid replacements to synonymous mutations (7:1), as compared to that of other genes, such as the Adh (2:42). Nevertheless, nucleotide sequence comparison with the *Drosophila erecta* ref(2)P gene shows that selective pressures are exerted to maintain the existence of a functional protein. The effects of this high variability on the ref(2)P protein are discussed in relation to its specific antiviral properties and to its function in *D. melanogaster*, where it is required for male fertility.

Additional References

Control of sigma virus multiplication by the ref(2)P gene of *Drosophila melanogaster*: an in vivo study of the PB1 domain of Ref(2)P. (2007) (<https://pubmed.ncbi.nlm.nih.gov/17409092>)

Localization of domains within the *Drosophila* Ref(2)P protein involved in the intracellular control of sigma rhabdovirus multiplication. (1995) (<https://pubmed.ncbi.nlm.nih.gov/7769706>)

RELATED GEPHE

Related Genes

15 (18-wheeler, CG8492, Dipteracin, Drosomycin-like 5, Ge-1, GNBP1, GNBP2, Immune deficiency, Lectin-24A, pastrel, PGRP-LC, SR-CII, Tehao, Ubiquitin conjugating enzyme E2H (Ubc-E2H), CHKov1) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^ref\(2\)P^/and+Taxon ID=^7227^/or+Gene Gephebase=^ref\(2\)P^/and+Taxon ID=^7227^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^ref(2)P^/and+Taxon ID=^7227^/or+Gene Gephebase=^ref(2)P^/and+Taxon ID=^7227^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

<http://flybase.org/reports/FBal0014525.html>

