

GEPHE SUMMARY

ref(2)P (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^ref(2)P^#gephebase-summary-title)	Gephebase Gene	GP00001995	GephelD
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		
Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)	Taxon A	Latin Name	Taxon B
fruit fly	Common Name	Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title)	Latin Name
Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms	fruit fly	Common Name
species	Rank	Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster	Synonyms
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; Ephydriodea; 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; Ephydriodea; 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 Infraspecies?	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

ref(2)P	Generic Gene Name	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	0
-	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; Dezâ©lâ© 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, Diptericin, 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>

