GEPHE SUMMARY

Gephebase Gene

Ubiquitin conjugating enzyme E2H (Ubc-E2H) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Ubiquitin conjugating enzyme E2H (Ubc-E2H)^#gephebase-summary-title)

Entry Status

Published

GepheID

GP00001480

Main curator

Prigent

PHENOTYPIC CHANGE

Trait Category

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

Trait

Pathogen resistance (Drosophila C virus & cricket paralysis virus) (https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen resistance (Drosophila C virus & cricket paralysis virus)^#gephebase-summary-title)

Trait State in Taxon A

D. melanogaster mostly sensitive without selection

Trait State in Taxon B

D. melanogaster resistant after selection

Ancestral State

Taxon A

Taxonomic Status

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

Taxon A

Latin Name

Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila melanogaster^#gephebase-summary-title)

Common Name

fruit fly

Synonyms

Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster

Rank

species

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

Parent

melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID

7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Drosophila melanogaster (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila melanogaster^#gephebase-summary-title)

Common Name

fruit fly

Synonyms

Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster

Rank

species

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

Parent

melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)

NCBI Taxonomy ID

7227 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7227)

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

UbcE2H

Synonyms

CG2257; Dmel\CG2257; dUbc-E2H; Ubc-2EH; Ubc-E2H; Ubc-E2Hs; UbcDE2H; ubcE2h; Dmel_CG2257

String

7227.FBpp0071067 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 7227.FBpp0071067)

Sequence Similarities

Belongs to the ubiquitin-conjugating enzyme family.

GO - Molecular Function

GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)

UniProtKB Drosophila melanogaster

Q7JW03 (http://www.uniprot.org/uniprot/Q7JW03)

GenebankID or UniProtKB

NM_167145.2 (https://www.ncbi.nlm.nih.gov/nuccore/NM_167145.2)

GO:0004842 : ubiquitin-protein transferase activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0004842)
GO:0061631 : ubiquitin conjugating enzyme activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0061631)

GO - Biological Process

GO:0006511 : ubiquitin-dependent protein catabolic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0006511)
GO:0000209 : protein polyubiquitination
(https://www.ebi.ac.uk/QuickGO/term/GO:0000209)

GO - Cellular Component

-

Presumptive Null

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Host adaptation to viruses relies on few genes with different cross-resistance properties. (2014) (https://pubmed.ncbi.nlm.nih.gov/24711428)

Authors

Martins NE; Faria VG; Nolte V; SchlÃ¶tterer C; Teixeira L; Sucena Ã‰; MagalhÃ£es S

Abstract

Host adaptation to one parasite may affect its response to others. However, the genetics of these direct and correlated responses remains poorly studied. The overlap between these responses is instrumental for the understanding of host evolution in multiparasite environments. We determined the genetic and phenotypic changes underlying adaptation of Drosophila melanogaster to Drosophila C virus (DCV). Within 20 generations, flies selected with DCV showed increased survival after DCV infection, but also after cricket paralysis virus (CrPV) and flock house virus (FHV) infection. Whole-genome sequencing identified two regions of significant differentiation among treatments, from which candidate genes were functionally tested with RNAi. Three genes were validated--pastrel, a known DCV-response gene, and two other loci, Ubc-E2H and CG8492. Knockdown of Ubc-E2H and pastrel also led to increased sensitivity to CrPV, whereas knockdown of CG8492 increased susceptibility to FHV infection. Therefore, Drosophila adaptation to DCV relies on few major genes, each with different cross-resistance properties, conferring host resistance to several parasites.

Additional References

RELATED GEPHE

Related Genes

15 (18-wheeler, CG8492, Diptericin, Drosomycin-like 5, Ge-1, GNBP1, GNBP2, Immune deficiency, Lectin-24A, pastrel, PGRP-LC, ref(2)P, SR-CII, Tehao, CHKov1)
(https://www.gephebase.org/search-criteria?/or+Taxon ID=^7227^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Validated by functional test with RNAi