

## GEPHE SUMMARY

<p>GNBP1 (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^GNBP1^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^GNBP1^#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00000408</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
---	---	---------------------------------	------------------------------------

## PHENOTYPIC CHANGE

<p>Physiology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title</a>)</p> <p>Pathogen resistance (<a href="https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen+resistance^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen+resistance^#gephebase-summary-title</a>)</p> <p>Drosophila melanogaster</p> <p>Drosophila melanogaster</p> <p>Data not curated</p> <p>Intraspecific (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title</a>)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Drosophila melanogaster (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title</a>)</p> <p>Common Name</p> <p>fruit fly</p> <p>Synonyms</p> <p>Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>melanogaster subgroup () - (Rank: species subgroup) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351</a>)</p> <p>NCBI Taxonomy ID</p> <p>7227 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227</a>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Drosophila melanogaster (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Drosophila+melanogaster^#gephebase-summary-title</a>)</p> <p>Common Name</p> <p>fruit fly</p> <p>Synonyms</p> <p>Sophophora melanogaster; fruit fly; Drosophila melanogaster Meigen, 1830; Sophophora melanogaster (Meigen, 1830); Drosophila melangaster</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>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</p> <p>Parent</p> <p>melanogaster subgroup () - (Rank: species subgroup) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32351</a>)</p> <p>NCBI Taxonomy ID</p> <p>7227 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7227</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p>
---	---	--	--

## GENOTYPIC CHANGE

<p>GNBP1</p> <p>CG6895; DGNBP-1; DGNBP1; Dmel\CG6895; GNBP; GNBP 1; GNBP-1</p> <p>7227.FBpp0074817 (<a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0074817">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0074817</a>)</p> <p>Belongs to the insect beta-1,3-glucan binding protein family.</p> <p>GO:0001872 : (1-&gt;3)-beta-D-glucan binding (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0001872">https://www.ebi.ac.uk/QuickGO/term/GO:0001872</a>)</p> <p>GO:0004553 : hydrolase activity, hydrolyzing O-glycosyl compounds (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0004553">https://www.ebi.ac.uk/QuickGO/term/GO:0004553</a>)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p>	<p>UniProtKB Drosophila melanogaster Q9NHB0 (<a href="http://www.uniprot.org/uniprot/Q9NHB0">http://www.uniprot.org/uniprot/Q9NHB0</a>)</p> <p>GenebankID or UniProtKB AE014296 (<a href="https://www.ncbi.nlm.nih.gov/nucleotide/7227.FBpp0074817">https://www.ncbi.nlm.nih.gov/nucleotide/7227.FBpp0074817</a>)</p>
--	--	---

GO:0001530 : lipopolysaccharide binding  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001530>)  
GO:0042834 : peptidoglycan binding  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042834>)  
GO:0030247 : polysaccharide binding  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030247>)  
GO:0008329 : signaling pattern recognition receptor activity  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008329>)

#### GO - Biological Process

GO:0006955 : immune response (<https://www.ebi.ac.uk/QuickGO/term/GO:0006955>)  
GO:0045087 : innate immune response  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045087>)  
GO:0005975 : carbohydrate metabolic process  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005975>)  
GO:0045088 : regulation of innate immune response  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045088>)  
GO:0050830 : defense response to Gram-positive bacterium  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0050830>)  
GO:0002758 : innate immune response-activating signal transduction  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0002758>)  
GO:0002221 : pattern recognition receptor signaling pathway  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0002221>)  
GO:0009253 : peptidoglycan catabolic process  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009253>)  
GO:0045752 : positive regulation of Toll signaling pathway  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045752>)

#### GO - Cellular Component

GO:0005576 : extracellular region (<https://www.ebi.ac.uk/QuickGO/term/GO:0005576>)  
GO:0009986 : cell surface (<https://www.ebi.ac.uk/QuickGO/term/GO:0009986>)  
GO:0046658 : anchored component of plasma membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0046658>)

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

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

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration 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

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

Genotype and gene expression associations with immune function in *Drosophila*. (2010) (<https://pubmed.ncbi.nlm.nih.gov/20066029>) Authors

Sackton TB; Lazzaro BP; Clark AG Abstract

It is now well established that natural populations of *Drosophila melanogaster* harbor substantial genetic variation associated with physiological measures of immune function. In no case, however, have intermediate measures of immune function, such as transcriptional activity of immune-related genes, been tested as mediators of phenotypic variation in immunity. In this study, we measured bacterial load sustained after infection of *D. melanogaster* with *Serratia marcescens*, *Providencia rettgeri*, *Enterococcus faecalis*, and *Lactococcus lactis* in a panel of 94 third-chromosome substitution lines. We also measured transcriptional levels of 329 immune-related genes eight hours after infection with *E. faecalis* and *S. marcescens* in lines from the phenotypic tails of the test panel. We genotyped the substitution lines at 137 polymorphic markers distributed across 25 genes in order to test for statistical associations among genotype, bacterial load, and transcriptional dynamics. We find that genetic polymorphisms in the pathogen recognition genes (and particularly in PGRP-LC, GGBP1, and GGBP2) are most significantly associated with variation in bacterial load. We also find that overall transcriptional induction of effector proteins is a significant predictor of bacterial load after infection with *E. faecalis*, and that a marker upstream of the recognition gene PGRP-SD is statistically associated with variation in both bacterial load and transcriptional induction of effector proteins. These results show that polymorphism in genes near the top of the immune system signaling cascade can have a disproportionate effect on organismal phenotype due to the amplification of minor effects through the cascade.

Additional References

## RELATED GEPHE

15 (18-wheeler, CG8492, Dipteracin, Drosomycin-like 5, Ge-1, GGBP2, Immune deficiency, Lectin-24A, pastrel, PGRP-LC, ref(2)P, 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 Genes

No matches found. Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

