

GEPHE SUMMARY

	Gephebase Gene	GepheID
HECW-1 (<a +hecw-1+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+HECW-1+"#gephebase-summary-title)	GP00000453	
	Entry Status	Main curator
Published	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Behavior (<a +behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Behavior+"#gephebase-summary-title)		Trait	
Pathogen avoidance (<a +pathogen+avoidance+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Pathogen+avoidance+"#gephebase-summary-title)			
	Trait State in Taxon A		
C. elegans - N2		Trait State in Taxon B	
C.elegans wild strains			
	Ancestral State		
Data not curated		Taxonomic Status	
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Caenorhabditis elegans (<a +caenorhabditis+elegans+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Caenorhabditis+elegans+"#gephebase-summary-title)		Caenorhabditis elegans (<a +caenorhabditis+elegans+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Caenorhabditis+elegans+"#gephebase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900		roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	
	Parent		Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)		Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)	
6239 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6239)	NCBI Taxonomy ID	6239 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6239)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
C. elegans - N2		C.elegans wild strains	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Caenorhabditis elegans
hecw-1		G5EEJ0 (http://www.uniprot.org/uniprot/G5EEJ0)
	Synonyms	GenebankID or UniProtKB
F45H7.6		BX284603 (https://www.ncbi.nlm.nih.gov/nucleotide/BX284603)
	String	
6239.F45H7.6 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier= 6239.F45H7.6)		
-	Sequence Similarities	
	GO - Molecular Function	
GO:0061630 : ubiquitin protein ligase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0061630)		
	GO - Biological Process	
GO:0016567 : protein ubiquitination (https://www.ebi.ac.uk/QuickGO/term/GO:0016567)		
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:0048814 : regulation of dendrite morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048814>)
GO:0045732 : positive regulation of protein catabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045732>)
GO:2000650 : negative regulation of sodium ion transmembrane transporter activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:2000650>)
GO:0043161 : proteasome-mediated ubiquitin-dependent protein catabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043161>)
GO:1900424 : regulation of defense response to bacterium
(<https://www.ebi.ac.uk/QuickGO/term/GO:1900424>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~No~#gephebase-summary-title))

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding~#gephebase-summary-title))

SNP ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~SNP~#gephebase-summary-title))

Nonsynonymous

Q325P

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping~#gephebase-summary-title))

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Natural polymorphisms in *C. elegans* HECW-1 E3 ligase affect pathogen avoidance behaviour. (2011) (<https://pubmed.ncbi.nlm.nih.gov/22089131>)

Chang HC; Paek J; Kim DH

Heritable variation in behavioural traits generally has a complex genetic basis, and thus naturally occurring polymorphisms that influence behaviour have been defined only in rare instances. The isolation of wild strains of *Caenorhabditis elegans* has facilitated the study of natural genetic variation in this species and provided insights into its diverse microbial ecology. *C. elegans* responds to bacterial infection with conserved innate immune responses and, although lacking the immunological memory of vertebrate adaptive immunity, shows an aversive learning response to pathogenic bacteria. Here, we report the molecular characterization of naturally occurring coding polymorphisms in a *C. elegans* gene encoding a conserved HECT domain-containing E3 ubiquitin ligase, HECW-1. We show that two distinct polymorphisms in neighbouring residues of HECW-1 each affect *C. elegans* behavioural avoidance of a lawn of *Pseudomonas aeruginosa*. Neuron-specific rescue and ablation experiments and genetic interaction analysis indicate that HECW-1 functions in a pair of sensory neurons to inhibit *P. aeruginosa* lawn avoidance behaviour through inhibition of the neuropeptide receptor NPR-1 (ref. 10), which we have previously shown promotes *P. aeruginosa* lawn avoidance behaviour. Our data establish a molecular basis for natural variation in a *C. elegans* behaviour that may undergo adaptive changes in response to microbial pathogens.

RELATED GEPHE

1 (npr-1) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~6239~/and+Trait=Pathogen avoidance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~6239~/and+Trait=Pathogen+avoidance/and+groupHaplotypes=true#gephebase-summary-title))

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~HECW-1~/and+Taxon ID=~6239~/or+Gene Gephebase=~HECW-1~/and+Taxon ID=~6239~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~HECW-1~/and+Taxon+ID=~6239~/or+Gene+Gephebase=~HECW-1~/and+Taxon+ID=~6239~#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

