

## GEPHE SUMMARY

	Gephebase Gene		GepheID
Pore-forming toxin-like (PFT) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> )		GP00001563	
Gephebase="Pore-forming toxin-like (PFT)"#gephebase-summary-title)			Main curator
Published	Entry Status	Prigent	

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )			
Category="Physiology"#gephebase-summary-title)	Trait		
Pathogen resistance (Fusarium) ( <a (fusarium)"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=" pathogen="" resistance="">https://www.gephebase.org/search-criteria?/and+Trait="Pathogen resistance (Fusarium)"#gephebase-summary-title</a> )			
Chinese Spring (CS) wheat susceptible	Trait State in Taxon A		
Chinese wheat cultivar Sumai3 resistant	Trait State in Taxon B		
Unknown	Ancestral State		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )	Taxonomic Status		
Status="Intraspecific"#gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name		Latin Name
Triticum aestivum		Triticum aestivum	
( <a aestivum"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" triticum="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Triticum aestivum"#gephebase-summary-title</a> )		( <a aestivum"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" triticum="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Triticum aestivum"#gephebase-summary-title</a> )	
bread wheat	Common Name	bread wheat	Common Name
	Synonyms		Synonyms
Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivum; Triticum aestivum8		Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivum; Triticum aestivum8	
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticoeae; Triticinae; Triticum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticoeae; Triticinae; Triticum	
	Parent		Parent
Triticum () - (Rank: genus)		Triticum () - (Rank: genus)	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564</a> )		( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564</a> )	
4565	NCBI Taxonomy ID	4565	NCBI Taxonomy ID
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565</a> )		( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565</a> )	
Yes	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
	Taxon A Description		Taxon B Description
Chinese Spring (CS) wheat susceptible		Chinese wheat cultivar Sumai3 resistant	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Triticum aestivum
-		Q4JEV5 ( <a href="http://www.uniprot.org/uniprot/Q4JEV5">http://www.uniprot.org/uniprot/Q4JEV5</a> )	
	Synonyms		GenebankID or UniProtKB
-		0	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			
	GO - Biological Process		
GO:0009405 : pathogenesis ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009405">https://www.ebi.ac.uk/QuickGO/term/GO:0009405</a> )			
	GO - Cellular Component		
GO:0005576 : extracellular region ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005576">https://www.ebi.ac.uk/QuickGO/term/GO:0005576</a> )			

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

Presumptive Null

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

Molecular Type

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

Aberration Type

10-100 kb

Indel Size

PFT gene is present and constitutively expressed in resistant line and absent in susceptible line

Molecular Details of the Mutation

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))

Experimental Evidence

Wheat Fhb1 encodes a chimeric lectin with agglutinin domains and a pore-forming toxin-like domain conferring resistance to Fusarium head blight. (2016) (<https://pubmed.ncbi.nlm.nih.gov/27776114>)

Main Reference

Rawat N; Pumphrey MO; Liu S; Zhang X; Tiwari VK; Ando K; Trick HN; Bockus WW; Akhunov E; Anderson JA; Gill BS

Authors

Fusarium head blight (FHB), caused by *Fusarium graminearum*, is a devastating disease of wheat and barley that leads to reduced yield and mycotoxin contamination of grain, making it unfit for human consumption. FHB is a global problem, with outbreaks in the United States, Canada, Europe, Asia and South America. In the United States alone, total direct and secondary economic losses from 1993 to 2001 owing to FHB were estimated at \$7.67 billion. Fhb1 is the most consistently reported quantitative trait locus (QTL) for FHB resistance breeding. Here we report the map-based cloning of Fhb1 from a Chinese wheat cultivar Sumai 3. By mutation analysis, gene silencing and transgenic overexpression, we show that a pore-forming toxin-like (PFT) gene at Fhb1 confers FHB resistance. PFT is predicted to encode a chimeric lectin with two agglutinin domains and an ETX/MTX2 toxin domain. Our discovery identifies a new type of durable plant resistance gene conferring quantitative disease resistance to plants against *Fusarium* species.

Abstract

Additional References

## RELATED GEPHE

4 (Lr21, Lr67, Pm3, Mla (=Sr33/AetRGA1e)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~4565^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4565^/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title))

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

Considered null mutation when absent. PFT is predicted to encode a chimeric lectin with two agglutinin domains and an ETX/MTX2 toxin domain. Demonstrated by mutation analysis; gene silencing and transgenic overexpression