GEPHE SUMMARY

Gephebase Gene
Pto (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Pto^#gephebase-summary-title)

GepheID
GP00000937

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Lycopersicon esculentum Rio Grande - resistant

Trait State in Taxon B
Lycopersicon esculentum Rio Grande - sensitive

Ancestral State
Data not curated

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

Taxon A

Latin Name
Solanum lycopersicum (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Solanum lycopersicum^#gephebase-summary-title)

Common Name
tomato

Synonyms
Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon

Parent
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49274)

NCBI Taxonomy ID
4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4081)

is Taxon A an Infraspecies?
Yes

Taxon A Description
Lycopersicon esculentum Rio Grande - resistant

Taxon B

Latin Name
Solanum lycopersicum (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Solanum lycopersicum^#gephebase-summary-title)

Common Name
tomato

Synonyms
Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon

Parent
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49274)

NCBI Taxonomy ID
4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4081)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Lycopersicon esculentum Rio Grande - sensitive

GENOTYPIC CHANGE

Generic Gene Name
pto

Synonyms
101268866

String
4081.Solyc05g013320.1.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=4081.Solyc05g013320.1.1)

Sequence Similarities
Belongs to the protein kinase superfamily.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0004674 : protein serine/threonine kinase activity

UniProtKB Solanum lycopersicum
P93215 (http://www.uniprot.org/uniprot/P93215)

GenebankID or UniProtKB
AF220603 (https://www.ncbi.nlm.nih.gov/nuccore/AF220603)

(https://www.ebi.ac.uk/QuickGO/term/GO:0004674)
GO:0004672 : protein kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004672)

GO - Biological Process

GO:0046777 : protein autophosphorylation
(https://www.ebi.ac.uk/QuickGO/term/GO:0046777)

GO - Cellular Component

GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)
GO:0009506 : plasmodesma (https://www.ebi.ac.uk/QuickGO/term/GO:0009506)

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

Not identified

Experimental Evidence

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

Main Reference

Map-based cloning of a protein kinase gene conferring disease resistance in tomato. (1993) (https://pubmed.ncbi.nlm.nih.gov/7902614)

Authors

Martin GB; Brommonschenkel SH; Chunwongse J; Frary A; Ganal MW; Spivey R; Wu T; Earle ED; Tanksley SD

Abstract

The Pto gene in tomato confers resistance to races of Pseudomonas syringae pv. tomato that carry the avirulence gene avrPto. A yeast artificial chromosome clone that spans the Pto region was identified and used to probe a leaf complementary DNA (cDNA) library. A cDNA clone was isolated that represents a gene family, at least six members of which genetically cosegregate with Pto. When susceptible tomato plants were transformed with a cDNA from this family, they were resistant to the pathogen. Analysis of the amino acid sequence revealed similarity to serine-threonine protein kinases, suggesting a role for Pto in a signal transduction pathway.

Additional References

RELATED GEPHE

Related Genes

4 (Cf-2.1 and Cf-2.2, Cf-4/9, Mi1.2, MLO1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^4081^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS