GEPHE SUMMARY

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

GepheID
GP00002256

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

Trait State in Taxon A
Sensitive

Trait State in Taxon B
Resistance to avian sarcoma and leukosis viruses subgroup A

Ancestral State
Taxon A

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

Taxon A

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

Common Name
chicken

Synonyms
Gallus gallus domesticus; chicken; bantam; chickens

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Galloanserae; Galliformes; Phasianidae; Phasianinae; Gallus

Parent
Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9030)

NCBI Taxonomy ID
9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9031)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
chicken

Synonyms
Gallus gallus domesticus; chicken; bantam; chickens

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Sauropsida; Sauria; Archelosauria; Archosauria; Dinosauria; Saurischia; Theropoda; Coelurosauria; Aves; Neognathae; Galloanserae; Galliformes; Phasianidae; Phasianinae; Gallus

Parent
Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9030)

NCBI Taxonomy ID
9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9031)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
tva

Synonyms
-

String
-

Sequence Similarities
-

GO - Molecular Function
-

GO - Biological Process
-

GO - Cellular Component
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)

UniProtKB Gallus gallus
Q6JBY7 (http://www.uniprot.org/uniprot/Q6JBY7)

GenebankID or UniProtKB
()

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

c.120C>G p.C40W

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Cys	Trp	40

Main Reference

Two different molecular defects in the Tva receptor gene explain the resistance of two tvar lines of chickens to infection by subgroup A avian sarcoma and leukosis viruses. (2004) (https://pubmed.ncbi.nlm.nih.gov/15564460)

Authors

Elleder D; Melder DC; Trejbalova K; Svoboda J; Federspiel MJ

Abstract

The subgroup A to E avian sarcoma and leukosis viruses (ASLVs) are highly related and are thought to have evolved from a common ancestor. These viruses use distinct cell surface proteins as receptors to gain entry into avian cells. Chickens have evolved resistance to infection by the ASLVs. We have identified the mutations responsible for the block to virus entry in chicken lines resistant to infection by subgroup A ASLVs [ASLV(A)]. The tva genetic locus determines the susceptibility of chicken cells to ASLV(A) viruses. In quail, the ASLV(A) susceptibility allele tva(s) encodes two forms of the Tva receptor; these proteins are translated from alternatively spliced mRNAs. The normal cellular function of the Tva receptor is unknown; however, the extracellular domain contains a 40-amino-acid, cysteine-rich region that is homologous to the ligand binding region of the low-density lipoprotein receptor (LDLR) proteins. The chicken tva(s) cDNAs had not yet been fully characterized; we cloned the chicken tva cDNAs from two lines of subgroup A-susceptible chickens, line H6 and line 0. Two types of chicken tva(s) cDNAs were obtained. These cDNAs encode a longer and shorter form of the Tva receptor homologous to the Tva forms in quail. Two different defects were identified in cDNAs cloned from two different ASLV(A)-resistant inbred chickens, line C and line 7(2). Line C tva(r) contains a single base pair substitution, resulting in a cysteine-to-tryptophan change in the LDLR-like region of Tva. This mutation drastically reduces the binding affinity of Tva(R) for the ASLV(A) envelope glycoproteins. Line 7(2) tva(r2) contains a 4-bp insertion in exon 1 that causes a change in the reading frame, which blocks expression of the Tva receptor.

Additional References

RELATED GEPHE

Related Genes

2 (BTN1A1, MX1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9031^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

5 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^Tva^/and+Taxon ID=^9031^/or+Gene Gephebase=^Tva^/and+Taxon ID=^9031^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

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