

GEPHE SUMMARY

Tva (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=Tva^#gephebase-summary-title)	Gephebase Gene	GP00002261	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology^#gephebase-summary-title)	Trait Category		
Pathogen resistance (virus) (https://www.gephebase.org/search-criteria?/and+Trait=Pathogen+resistance+(virus)^#gephebase-summary-title)	Trait		
Sensitive	Trait State in Taxon A		
Resistance to avian sarcoma and leukosis viruses subgroup A	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Intraspecific^#gephebase-summary-title)	Taxonomic Status		

Taxon A		Taxon B	
	Latin Name		Latin Name
Gallus gallus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Gallus+gallus^#gephebase-summary-title)	Gallus gallus	Gallus gallus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Gallus+gallus^#gephebase-summary-title)	Gallus gallus
chicken	Common Name	chicken	Common Name
Gallus gallus domesticus; chicken; bantam; chickens	Synonyms	Gallus gallus domesticus; chicken; bantam; chickens	Synonyms
species	Rank	species	Rank
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	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	Lineage
Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)	Parent	Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)	Parent
9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)	NCBI Taxonomy ID	9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

tva	Generic Gene Name	Q6JBY7 (http://www.uniprot.org/uniprot/Q6JBY7)	UniProtKB Gallus gallus
-	Synonyms	()	GenebankID or UniProtKB
-	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)			Presumptive Null
Yes (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=Yes^#gephebase-summary-title)			

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

Molecular Type

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

Aberration Type

1-9 bp

Deletion Size

c.507-511del5 ; splicing

Molecular Details of the Mutation

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

Experimental Evidence

Intronic deletions that disrupt mRNA splicing of the tva receptor gene result in decreased susceptibility to infection by avian sarcoma and leukosis virus subgroup A. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22171251>)

Main Reference

Reinić M; Plach J; Trejbalov K; Anđelić F; Kučerová D; Geryk J; Svoboda J; Hejnar J

Authors

The group of closely related avian sarcoma and leukosis viruses (ASLVs) evolved from a common ancestor into multiple subgroups, A to J, with differential host range among galliform species and chicken lines. These subgroups differ in variable parts of their envelope glycoproteins, the major determinants of virus interaction with specific receptor molecules. Three genetic loci, tva, tvb, and tvc, code for single membrane-spanning receptors from diverse protein families that confer susceptibility to the ASLV subgroups. The host range expansion of the ancestral virus might have been driven by gradual evolution of resistance in host cells, and the resistance alleles in all three receptor loci have been identified. Here, we characterized two alleles of the tva receptor gene with similar intronic deletions comprising the deduced branch-point signal within the first intron and leading to inefficient splicing of tva mRNA. As a result, we observed decreased susceptibility to subgroup A ASLV in vitro and in vivo. These alleles were independently found in a close-bred line of domestic chicken and Indian red jungle fowl (*Gallus gallus murghi*), suggesting that their prevalence might be much wider in outbred chicken breeds. We identified defective splicing to be a mechanism of resistance to ASLV and conclude that such a type of mutation could play an important role in virus-host coevolution.

Abstract

Additional References

RELATED GEPHE

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

Related Genes

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>)

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@AllelicSeries @Splicing <https://omia.org/OMIA001299/9031/>