

GEPHE SUMMARY

<p>Prolactin receptor (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="Prolactin receptor"#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00002280</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category="Morphology"#gephebase-summary-title)</p> <p>Feather (slow-feathering ; delay) (<a feather"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="Feather (slow-feathering ; delay)#gephebase-summary-title)</p> <p>Fast feathering in White Leghorn and Broiler</p> <p>Slow feathering in White Leghorn and Broiler ; dominant and sex-linked used for industrial sexing.</p> <p>Taxon A</p> <p>Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Domesticated"#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Gallus gallus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Gallus gallus"#gephebase-summary-title)</p> <p>chicken</p> <p>Gallus gallus domesticus; chicken; bantam; chickens</p> <p>species</p> <p>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</p> <p>Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)</p> <p>9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Gallus gallus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Gallus gallus"#gephebase-summary-title)</p> <p>chicken</p> <p>Gallus gallus domesticus; chicken; bantam; chickens</p> <p>species</p> <p>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</p> <p>Gallus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9030)</p> <p>9031 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9031)</p> <p>No</p>	<p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon A an Infrasppecies?</p>	<p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Infrasppecies?</p>
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GENOTYPIC CHANGE

<p>PRLR</p> <p>HPRL; MFAB; hPRLr; RI-PRLR</p> <p>9606.ENSP00000371432 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000371432)</p> <p>Belongs to the type I cytokine receptor family. Type 1 subfamily.</p> <p>GO:0042803 : protein homodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0042803)</p> <p>GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)</p> <p>GO:0017046 : peptide hormone binding (https://www.ebi.ac.uk/QuickGO/term/GO:0017046)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p>	<p>P16471 (http://www.uniprot.org/uniprot/P16471)</p> <p>0</p>	<p>UniProtKB Homo sapiens</p> <p>GenebankID or UniProtKB</p>
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GO:0019955 : cytokine binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0019955>)

GO:0004896 : cytokine receptor activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0004896>)

GO:0042978 : ornithine decarboxylase activator activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0042978>)

GO:0004925 : prolactin receptor activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0004925>)

GO - Biological Process

GO:0043066 : negative regulation of apoptotic process

(<https://www.ebi.ac.uk/QuickGO/term/GO:0043066>)

GO:0007171 : activation of transmembrane receptor protein tyrosine kinase activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007171>)

GO:0007166 : cell surface receptor signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007166>)

GO:0120162 : positive regulation of cold-induced thermogenesis

(<https://www.ebi.ac.uk/QuickGO/term/GO:0120162>)

GO:0042976 : activation of Janus kinase activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0042976>)

GO:0060397 : JAK-STAT cascade involved in growth hormone signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0060397>)

GO:0042110 : T cell activation (<https://www.ebi.ac.uk/QuickGO/term/GO:0042110>)

GO:0007566 : embryo implantation (<https://www.ebi.ac.uk/QuickGO/term/GO:0007566>)

GO:0007595 : lactation (<https://www.ebi.ac.uk/QuickGO/term/GO:0007595>)

GO:0006694 : steroid biosynthetic process

(<https://www.ebi.ac.uk/QuickGO/term/GO:0006694>)

GO - Cellular Component

GO:0016021 : integral component of membrane

(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)

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

GO:0043235 : receptor complex (<https://www.ebi.ac.uk/QuickGO/term/GO:0043235>)

GO:0005576 : extracellular region (<https://www.ebi.ac.uk/QuickGO/term/GO:0005576>)

GO:0009986 : cell surface (<https://www.ebi.ac.uk/QuickGO/term/GO:0009986>)

GO:0009897 : external side of plasma membrane

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009897>)

GO:0031904 : endosome lumen (<https://www.ebi.ac.uk/QuickGO/term/GO:0031904>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Insertion Size

100-1000 kb

Molecular Details of the Mutation

tandem duplication of 176324 basepairs resulting in a partially duplicated PRLR (dPRLR) gene nearly identical to the original PRLR ; except for its lack of a 149-amino acid C-terminal tail - which may titrate PRL ligands and act as a dominant-negative receptor

Experimental Evidence

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

Main Reference

Partial duplication of the PRLR and SPEF2 genes at the late feathering locus in chicken. (2008) (<https://pubmed.ncbi.nlm.nih.gov/18713476>)

Authors

Elferink MG; Valli AA; Jungerius AP; Crooijmans RP; Groenen MA

Abstract

One of the loci responsible for feather development in chickens is K. The K allele is partially dominant to the k+ allele and causes a retard in the emergence of flight feathers at hatch. The K locus is sex linked and located on the Z chromosome. Therefore, the locus can be utilized to produce phenotypes that identify the sexes of chicks at hatch. Previous studies on the organization of the K allele concluded the integration of endogenous retrovirus 21 (ev21) into one of two large homologous segments located on the Z chromosome of late feathering chickens. In this study, a detailed molecular analysis of the K locus and a DNA test to distinguish between homozygous and heterozygous late feathering males are presented.

The K locus was investigated with quantitative PCR by examining copy number variations in a total of fourteen markers surrounding the ev21 integration site. The results showed a duplication at the K allele and sequence analysis of the breakpoint junction indicated a tandem duplication of 176,324 basepairs. The tandem duplication of this region results in the partial duplication of two genes: the prolactin receptor and the gene encoding sperm flagellar protein 2. Sequence analysis revealed that the duplication is similar in Broiler and White Leghorn. In addition, twelve late feathering animals, including Broiler, White Leghorn, and Brown Layer lines, contained a 78 bp breakpoint junction fragment, indicating that the duplication is similar in all breeds. The breakpoint junction was used to develop a TaqMan-based quantitative PCR test to allow distinction between homozygous and heterozygous late feathering males. In total, 85.3% of the animals tested were correctly assigned, 14.7% were unassigned and no animals were incorrectly assigned.

The detailed molecular analysis presented in this study revealed the presence of a tandem duplication in the K allele. The duplication resulted in the partial duplication of two genes: the prolactin receptor and the gene encoding sperm flagellar protein 2. Furthermore, a DNA test was developed to distinguish between homozygous and heterozygous late feathering males.

Additional References

Endogenous viral gene ev21 is not responsible for the expression of late feathering in chickens. (2018) (<https://pubmed.ncbi.nlm.nih.gov/29253229>)

RELATED GEPHE

Related Genes

17 (ABCA1, CDKN2A, CYP19A1, Endothelin receptor B2, MC1R, PMEL17, SLC45A2=MATP, SOX10, tyrosinase (TYR), tyrosinase-related protein 1 (TYRP1), FGF20, GDF7, HOXC8 - uncertain, KRT6A, KRT75L4, Hoxb8, PDSS2) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=^9031^/and+Trait=Feather/and+groupHaplotypes=true#gephebase-summary-title>)

No matches found.

EXTERNAL LINKS

COMMENTS

@CNV @Dominance @Parallelism <https://omia.org/OMIA000380/9031/> ; strikingly similar mutation in turkey