GEPHE SUMMARY

Gephebase Gene

Interleukin 10 (IL10) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Interleukin 10 (IL10)^#gephebase-summary-title)

GepheID

GP00001597

Entry Status

Published

Main curator

Prigent

PHENOTYPIC CHANGE

Trait Category

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

Trait

Immune response (antibody titre and complement activation) (https://www.gephebase.org/search-criteria?/and+Trait=^Immune response (antibody titre and complement activation)^#gephebase-summary-title)

Trait State in Taxon A

Laying hen of Rhode Island Red type

Trait State in Taxon B

Laying hen of White Leghorn type

Ancestral State

Unknown

Taxonomic Status

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

Yes

Taxon A Description

Laying hen of Rhode Island Red type

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?

Yes

Taxon B Description

Laying hen of White Leghorn type

GENOTYPIC CHANGE

Generic Gene Name

IL10

Synonyms

IL-10; interleukin-10

String

9031.ENSGALP00000001310 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9031.ENSGALP00000001310)

UniProtKB Gallus gallus

Q6A2H4 (http://www.uniprot.org/uniprot/Q6A2H4)

GenebankID or UniProtKB

()

Sequence Similarities

Belongs to the IL-10 family.

GO - Molecular Function

GO:0005125 : cytokine activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005125)

GO - Biological Process

GO:0006955 : immune response (https://www.ebi.ac.uk/QuickGO/term/GO:0006955)

GO:0045019 : negative regulation of nitric oxide biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0045019)
GO:0042742 : defense response to bacterium
(https://www.ebi.ac.uk/QuickGO/term/GO:0042742)
GO:0006954 : inflammatory response
(https://www.ebi.ac.uk/QuickGO/term/GO:0006954)
GO:0001938 : positive regulation of endothelial cell proliferation
(https://www.ebi.ac.uk/QuickGO/term/GO:0001938)
GO:0051384 : response to glucocorticoid
(https://www.ebi.ac.uk/QuickGO/term/GO:0051384)
GO:0045787 : positive regulation of cell cycle
(https://www.ebi.ac.uk/QuickGO/term/GO:0045787)
GO:0071222 : cellular response to lipopolysaccharide
(https://www.ebi.ac.uk/QuickGO/term/GO:0071222)
GO:1903672 : positive regulation of sprouting angiogenesis
(https://www.ebi.ac.uk/QuickGO/term/GO:1903672)
GO:2000352 : negative regulation of endothelial cell apoptotic process
(https://www.ebi.ac.uk/QuickGO/term/GO:2000352)
GO:0045348 : positive regulation of MHC class II biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0045348)
GO:0042832 : defense response to protozoan
(https://www.ebi.ac.uk/QuickGO/term/GO:0042832)
GO:0051091 : positive regulation of DNA-binding transcription factor activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0051091)
GO:0032720 : negative regulation of tumor necrosis factor production
(https://www.ebi.ac.uk/QuickGO/term/GO:0032720)
GO:1902895 : positive regulation of pri-miRNA transcription by RNA polymerase II
(https://www.ebi.ac.uk/QuickGO/term/GO:1902895)
GO:0035729 : cellular response to hepatocyte growth factor stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0035729)
GO:0030889 : negative regulation of B cell proliferation
(https://www.ebi.ac.uk/QuickGO/term/GO:0030889)
GO:0002875 : negative regulation of chronic inflammatory response to antigenic stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0002875)
GO:0060302 : negative regulation of cytokine activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0060302)
GO:0002740 : negative regulation of cytokine secretion involved in immune response
(https://www.ebi.ac.uk/QuickGO/term/GO:0002740)
GO:0044130 : negative regulation of growth of symbiont in host
(https://www.ebi.ac.uk/QuickGO/term/GO:0044130)
GO:0034115 : negative regulation of heterotypic cell-cell adhesion
(https://www.ebi.ac.uk/QuickGO/term/GO:0034115)
GO:1903208 : negative regulation of hydrogen peroxide-induced neuron death
(https://www.ebi.ac.uk/QuickGO/term/GO:1903208)
GO:0045077 : negative regulation of interferon-gamma biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0045077)
GO:0032695 : negative regulation of interleukin-12 production
(https://www.ebi.ac.uk/QuickGO/term/GO:0032695)
GO:0032715 : negative regulation of interleukin-6 production
(https://www.ebi.ac.uk/QuickGO/term/GO:0032715)
GO:0051045 : negative regulation of membrane protein ectodomain proteolysis
(https://www.ebi.ac.uk/QuickGO/term/GO:0051045)
GO:0030886 : negative regulation of myeloid dendritic cell activation
(https://www.ebi.ac.uk/QuickGO/term/GO:0030886)
GO:0002826 : negative regulation of T-helper 1 type immune response
(https://www.ebi.ac.uk/QuickGO/term/GO:0002826)
GO:1904706 : negative regulation of vascular smooth muscle cell proliferation
(https://www.ebi.ac.uk/QuickGO/term/GO:1904706)
GO:0002904 : positive regulation of B cell apoptotic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0002904)
GO:0050715 : positive regulation of cytokine secretion
(https://www.ebi.ac.uk/QuickGO/term/GO:0050715)
GO:0032800 : receptor biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0032800)
GO:1903034 : regulation of response to wounding
(https://www.ebi.ac.uk/QuickGO/term/GO:1903034)

GO - Cellular Component

GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)
GO:0005615 : extracellular space (https://www.ebi.ac.uk/QuickGO/term/GO:0005615)

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

unknown

Experimental Evidence

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

Main Reference

Across-line SNP association study of innate and adaptive immune response in laying hens. (2010) (https://pubmed.ncbi.nlm.nih.gov/19781038)

Authors

Biscarini F; Bovenhuis H; van Arendonk JA; Parmentier HK; Jungerius AP; van der Poel JJ

Abstract

The aim of the present study was to detect quantitative trait loci (QTL) for innate and adaptive immunity in laying hens. For this purpose, the associations between 1022 single nucleotide polymorphism (SNP) markers and immune traits were studied in 583 hens from nine different layer lines. Immune traits were natural antibodies for keyhole limpet haemocyanin (KLH) and lipopolysaccharide (LPS) at 20, 40 and 65 weeks, acquired antibodies to the vaccinal virus of Newcastle disease at 20 weeks, and complement activity measured on sheep and bovine red blood cells at 20, 40 and 65 weeks. We adopted a novel approach based on across-line analysis and testing of the SNP-by-line interaction. Among lines, linkage disequilibrium is conserved at shorter distances than in individual lines; therefore, SNPs significantly associated with immune traits across lines are expected to be near the functional mutations. In the analysis, the SNPs that had a significant across-line effect but did not show significant SNP-by-line interaction were identified to test whether the association was consistent in the individual lines. Ultimately, 59 significant associations between SNPs and immune traits were detected. Our results confirmed some previously identified QTL and identified new QTL potentially involved in the immune function. We found evidence for a role of IL17A (chromosome 3) in natural and acquired antibody titres and in the classical and alternative pathways of complement activation. The major histocompatibility genes on chromosome 16 showed significant association with natural and acquired antibody titres and classical complement activity. The IL12B gene on chromosome 13 was associated with natural antibody titres.

Additional References

RELATED GEPHE

Related Genes

4 (HTR2C serotonin receptor, HTR3A serotonin receptor, Interleukin 12B (IL12B), Interleukin 17A (IL17A)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9031^/and+Trait=Immune response/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

1 associated SNP