

GEPHE SUMMARY

EphB2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~EphB2~#gephebase-summary-title)	Gephebase Gene	GP00000275	GepheID
	Entry Status	Martin	Main curator
	Published		

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Morphology~#gephebase-summary-title)		Trait Category	
Feathers (crest morphology) (https://www.gephebase.org/search-criteria?/and+Trait=~Feathers (crest morphology)~#gephebase-summary-title)		Trait	
Columba livia - No crest (dominant)		Trait State in Taxon A	
Columba livia - Crest (recessive)		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated~#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Columba livia (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Columba livia~#gephebase-summary-title)		Columba livia (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Columba livia~#gephebase-summary-title)	
rock pigeon		rock pigeon	
Columba livia domestica; rock pigeon; carrier pigeon; domestic pigeon; rock dove; Columba livia Gmelin, JF, 1789		Columba livia domestica; rock pigeon; carrier pigeon; domestic pigeon; rock dove; Columba livia Gmelin, JF, 1789	
species		species	
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; Columbiformes; Columbidae; Columba		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; Columbiformes; Columbidae; Columba	
Columba () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8931)		Columba () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8931)	
8932 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8932)		8932 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 8932)	
No		No	

GENOTYPIC CHANGE

EPHB2		Generic Gene Name	
CEK5		Synonyms	
9031.ENS GALP00000007541 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9031.ENS GALP00000007541)		String	
Belongs to the protein kinase superfamily. Tyr protein kinase family. Ephrin receptor subfamily.		Sequence Similarities	
GO:0004888 : transmembrane signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004888)		GO - Molecular Function	
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)		UniProtKB Gallus gallus	
GO:0004714 : transmembrane receptor protein tyrosine kinase activity		GenebankID or UniProtKB	
		XP_013225843 (https://www.ncbi.nlm.nih.gov/nuccore/XP_013225843)	
		P28693 (http://www.uniprot.org/uniprot/P28693)	

(<https://www.ebi.ac.uk/QuickGO/term/GO:0004714>)
GO:0004713 : protein tyrosine kinase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0004713>)
GO:0005005 : transmembrane-ephrin receptor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005005>)

GO - Biological Process

GO:0043066 : negative regulation of apoptotic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043066>)
GO:0030154 : cell differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030154>)
GO:0070374 : positive regulation of ERK1 and ERK2 cascade
(<https://www.ebi.ac.uk/QuickGO/term/GO:0070374>)
GO:0009968 : negative regulation of signal transduction
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009968>)
GO:0001525 : angiogenesis (<https://www.ebi.ac.uk/QuickGO/term/GO:0001525>)
GO:0007411 : axon guidance (<https://www.ebi.ac.uk/QuickGO/term/GO:0007411>)
GO:0007413 : axonal fasciculation (<https://www.ebi.ac.uk/QuickGO/term/GO:0007413>)
GO:0060996 : dendritic spine development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0060996>)
GO:0060997 : dendritic spine morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0060997>)
GO:0048013 : ephrin receptor signaling pathway
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048013>)
GO:0018108 : peptidyl-tyrosine phosphorylation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0018108>)
GO:1900273 : positive regulation of long-term synaptic potentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:1900273>)
GO:0051965 : positive regulation of synapse assembly
(<https://www.ebi.ac.uk/QuickGO/term/GO:0051965>)
GO:0021963 : spinothalamic tract morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0021963>)
GO:0099557 : trans-synaptic signaling by trans-synaptic complex, modulating synaptic transmission (<https://www.ebi.ac.uk/QuickGO/term/GO:0099557>)

GO - Cellular Component

GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)
GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005887 : integral component of plasma membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)
GO:0043235 : receptor complex (<https://www.ebi.ac.uk/QuickGO/term/GO:0043235>)
GO:0030425 : dendrite (<https://www.ebi.ac.uk/QuickGO/term/GO:0030425>)
GO:0043005 : neuron projection (<https://www.ebi.ac.uk/QuickGO/term/GO:0043005>)
GO:0030424 : axon (<https://www.ebi.ac.uk/QuickGO/term/GO:0030424>)

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)	Molecular Type
SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP~#gephebase-summary-title)	Aberration Type
Nonsynonymous	SNP Coding Change
Arg758Cys (C>T) p.R758C	Molecular Details of the Mutation
Association Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Association Mapping~#gephebase-summary-title)	Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Arg	Cys	758

Main Reference

Genomic diversity and evolution of the head crest in the rock pigeon. (2013) (<https://pubmed.ncbi.nlm.nih.gov/23371554>)

Authors

Shapiro MD; Kronenberg Z; Li C; Domyan ET; Pan H; Campbell M; Tan H; Huff CD; Hu H; Vickrey AI; Nielsen SC; Stringham SA; Hu H; Willerslev E; Gilbert MT; Yandell M; Zhang G; Wang J

Abstract

The geographic origins of breeds and the genetic basis of variation within the widely distributed and phenotypically diverse domestic rock pigeon (*Columba livia*) remain largely unknown. We generated a rock pigeon reference genome and additional genome sequences representing domestic and feral populations. We found evidence for the origins of major breed groups in the Middle East and contributions from a racing breed to North American feral populations. We identified the gene EphB2 as a strong candidate for the derived head crest phenotype shared by numerous breeds, an important trait in mate selection in many avian species. We also found evidence that this trait evolved just once and spread throughout the species, and that the crest originates early in development by the localized molecular reversal of feather bud polarity.

Additional References

Convergent Evolution of Head Crests in Two Domesticated Columbids Is Associated with Different Missense Mutations in EphB2. (2015) (<https://pubmed.ncbi.nlm.nih.gov/26104009>)

RELATED GEPHE

5 (MC1R, Mlana, SLC45A2=MATP, SOX10, tyrosinase-related protein 1 (TYRP1)) (<https://www.gephebase.org/search-criteria?/or+TaxonID=^8932^/and+Trait=Feathers/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

<https://omia.org/OMIA000240/328808/>