

GEPHE SUMMARY

EphB2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~EphB2~#gephebase-summary-title)	Gephebase Gene	GP00000276	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	
Streptopelia risoria - No crest (dominant)		Trait State in Taxon A	
Streptopelia risoria - 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	
Streptopelia risoria (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Streptopelia risoria~#gephebase-summary-title)		Streptopelia risoria (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Streptopelia risoria~#gephebase-summary-title)	
ringneck dove		ringneck dove	
Columba risoria; Streptopelia roseogrisea risoria; ringneck dove; Streptopelia roseogrisea risoria (Linnaeus, 1758)		Columba risoria; Streptopelia roseogrisea risoria; ringneck dove; Streptopelia roseogrisea risoria (Linnaeus, 1758)	
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; Streptopelia		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; Streptopelia	
Streptopelia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 36242)		Streptopelia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 36242)	
328808 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 328808)		328808 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 328808)	
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	

(<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
Gly636Arg (G>A)	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title)	Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Gly	Arg	636

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>)
Vickrey AI; Domyan ET; Horvath MP; Shapiro MD

Head crests are important display structures in wild bird species and are also common in domesticated lineages. Many breeds of domestic rock pigeon (*Columba livia*) have crests of reversed occipital feathers, and this recessive trait is associated with a nonsynonymous coding mutation in the intracellular kinase domain of EphB2 (Ephrin receptor B2). The domestic ringneck dove (*Streptopelia risoria*) also has a recessive crested morph with reversed occipital feathers, and interspecific crosses between crested doves and pigeons produce crested offspring, suggesting a similar genetic basis for this trait in both species. We therefore investigated EphB2 as a candidate for the head crest phenotype of ringneck doves and identified a nonsynonymous coding mutation in the intracellular kinase domain that is significantly associated with the crested morph. This mutation is over 100 amino acid positions away from the crest mutation found in rock pigeons, yet both mutations are predicted to negatively affect the function of ATP-binding pocket. Furthermore, bacterial toxicity assays suggest that “crest” mutations in both species severely impact kinase activity. We conclude that head crests are associated with different mutations in the same functional domain of the same gene in two different columbid species, thereby representing striking evolutionary convergence in morphology and molecules.

RELATED GEPHE

No matches found.

No matches found.

Related Genes

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Parallelism ; <https://omia.org/OMIA000240/328808/>