

GEPHE SUMMARY

Gephebase Gene

lysozyme

Entry Status

Published

GepheID

GP00000556

Main curator

Martin

PHENOTYPIC CHANGE

Trait Category

Physiology

Trait

Digestion (anaerobic enzymatic activity)

Trait State in Taxon A

Other birds

Trait State in Taxon B

Opisthocomus hoazin

Ancestral State

Taxon A

Taxonomic Status

Intergeneric or Higher

Taxon A

Latin Name

Aves

Common Name

birds

Synonyms

avian; birds

Rank

class

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

Parent

Coelurosauria () - (Rank: no rank)

NCBI Taxonomy ID

8782

is Taxon A an Intraspecies?

No

Taxon B

Latin Name

Opisthocomus hoazin

Common Name

-

Synonyms

Opisthocomus hoazin hoazin; hoatzin; Opisthocomus hoazin (Stattus Mueller, 1776)

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; Opisthocomiformes; Opisthocomidae; Opisthocomus

Parent

Opisthocomus () - (Rank: genus)

NCBI Taxonomy ID

30419

is Taxon B an Intraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

LYZ1

Synonyms

-

String

-

Sequence Similarities

Belongs to the glycosyl hydrolase 22 family.

GO - Molecular Function

GO:0003796 : lysozyme activity

GO - Biological Process

GO:0050829 : defense response to Gram-negative bacterium

GO:0050830 : defense response to Gram-positive bacterium

GO:0019835 : cytolysis

GO:0007586 : digestion

GO:0008152 : metabolic process

GO - Cellular Component

-

UniProtKB Bos taurus

P04421

GenebankID or UniProtKB

AAA73935

Mutation #1

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

R14E

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Arg	Glu	14

Main Reference

[Molecular adaptation of a leaf-eating bird: stomach lysozyme of the hoatzin. \(1994\)](#)

Authors

Kornegay JR; Schilling JW; Wilson AC

Abstract

This report describes a lysozyme expressed at high levels in the stomach of the hoatzin, the only known foregut-fermenting bird. Evolutionary comparison places it among the calcium-binding lysozymes rather than among the conventional types. Conventional lysozymes were recruited as digestive enzymes twice in the evolution of mammalian foregut fermenters, and these independently recruited lysozymes share convergent structural changes attributed to selective pressures in the stomach. Biochemical convergence and parallel amino acid replacements are observed in the hoatzin stomach lysozyme even though it has a different genetic origin from the mammalian examples and has undergone more than 300 million years of independent evolution.

Additional References

Mutation #2

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

V21E

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Val	Glu	21

Main Reference

[Molecular adaptation of a leaf-eating bird: stomach lysozyme of the hoatzin. \(1994\)](#)

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Additional References

Mutation #3

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

N75D

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Asn	Asp	75

Main Reference

[Molecular adaptation of a leaf-eating bird: stomach lysozyme of the hoatzin. \(1994\)](#)

Authors

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Additional References

Mutation #4

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

D87N

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Asp	Asn	87

Main Reference

[Molecular adaptation of a leaf-eating bird: stomach lysozyme of the hoatzin. \(1994\)](#)

Authors

Kornegay JR; Schilling JW; Wilson AC

Abstract

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Additional References

Mutation #5

Presumptive Null

No

Molecular Type

Coding

Aberration Type

SNP

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

R126K

Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Arg	Lys	126

Main Reference[Molecular adaptation of a leaf-eating bird: stomach lysozyme of the hoatzin. \(1994\)](#)**Authors**

Kornegay JR; Schilling JW; Wilson AC

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Additional References**RELATED GEPHE****Related Genes**

No matches found.

Related Haplotypes

No matches found.

COMMENTS

@SeveralMutationsWithEffect