

GEPHE SUMMARY

	Gephebase Gene		GepheID
myosin heavy chain 16 (MYH16) (https://www.gephebase.org/search-criteria?/and+Gene)		GP00000683	
Gephebase= [^] myosin heavy chain 16 (MYH16) [^] #gephebase-summary-title)			Main curator
	Entry Status	Martin	
Published			

PHENOTYPIC CHANGE

	Trait Category		
Morphology (https://www.gephebase.org/search-criteria?/and+Trait)			
Category= [^] Morphology [^] #gephebase-summary-title)			
	Trait		
Masticatory muscles (https://www.gephebase.org/search-criteria?/and+Trait)			
muscles [^] #gephebase-summary-title)			
	Trait State in Taxon A		
Pan troglodytes			
	Trait State in Taxon B		
Homo sapiens			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intergeneric or Higher (https://www.gephebase.org/search-criteria?/and+Taxonomic)			
Status= [^] Intergeneric or Higher [^] #gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name		Latin Name
Pan troglodytes		Homo sapiens	
(https://www.gephebase.org/search-criteria?/and+Taxon)		(https://www.gephebase.org/search-criteria?/and+Taxon)	
and Synonyms= [^] Pan troglodytes [^] #gephebase-summary-title)		and Synonyms= [^] Homo sapiens [^] #gephebase-summary-title)	
	Common Name		Common Name
chimpanzee		human	
	Synonyms		Synonyms
chimpanzee; Chimpanzee troglodytes		human; man; Homo sapiens Linnaeus, 1758; Home sapiens; Homo sapiens; Homo sapeins;	
	Rank	Homo sapien; Homo sapians; Homo sapien; Homo sapience; Homo sapiense; Homo sapients; Homo sapines; Homo spaiens; Homo spiens; Humo sapiens	
species			Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;		species	
Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;			
Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia;	
Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae;		Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii;	
Homininae; Pan		Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria;	
	Parent	Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae;	
Pan (chimpanzees) - (Rank: genus)		Homininae; Homo	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9596)			
	NCBI Taxonomy ID		
9598		Homo () - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9598)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9605)	
	is Taxon A an Intraspecies?		NCBI Taxonomy ID
No		9606	
		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9606)	
			is Taxon B an Intraspecies?
		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Homo sapiens
MYH16		Q9H6N6 (http://www.uniprot.org/uniprot/Q9H6N6)	
	Synonyms		GenebankID or UniProtKB
MYH5		AC004834 (https://www.ncbi.nlm.nih.gov/nuccore/AC004834)	
	String		
-			
	Sequence Similarities		
Belongs to the TRAFAC class myosin-kinesin ATPase superfamily. Myosin family.			
	GO - Molecular Function		
GO:0003774 : motor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003774)			
	GO - Biological Process		
-			
	GO - Cellular Component		
GO:0016459 : myosin complex (https://www.ebi.ac.uk/QuickGO/term/GO:0016459)			

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding^#gephebase-summary-title))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion^#gephebase-summary-title))

Deletion Size

1-9 bp

Molecular Details of the Mutation

2bp deletion at codon 660

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Candidate+Gene^#gephebase-summary-title))

Main Reference

Myosin gene mutation correlates with anatomical changes in the human lineage. (2004) (<https://pubmed.ncbi.nlm.nih.gov/15042088>)

Authors

Stedman HH; Kozyak BW; Nelson A; Thesier DM; Su LT; Low DW; Bridges CR; Shrager JB; Minugh-Purvis N; Mitchell MA

Abstract

Powerful masticatory muscles are found in most primates, including chimpanzees and gorillas, and were part of a prominent adaptation of Australopithecus and Paranthropus, extinct genera of the family Hominidae. In contrast, masticatory muscles are considerably smaller in both modern and fossil members of Homo. The evolving hominid masticatory apparatus--traceable to a Late Miocene, chimpanzee-like morphology--shifted towards a pattern of gracilization nearly simultaneously with accelerated encephalization in early Homo. Here, we show that the gene encoding the predominant myosin heavy chain (MYH) expressed in these muscles was inactivated by a frameshifting mutation after the lineages leading to humans and chimpanzees diverged. Loss of this protein isoform is associated with marked size reductions in individual muscle fibres and entire masticatory muscles. Using the coding sequence for the myosin rod domains as a molecular clock, we estimate that this mutation appeared approximately 2.4 million years ago, predating the appearance of modern human body size and emigration of Homo from Africa. This represents the first proteomic distinction between humans and chimpanzees that can be correlated with a traceable anatomic imprint in the fossil record.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS