GEPHE SUMMARY

Gephebase Gene

ABO histo blood group glycosyltransferase (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^ABO histo blood group glycosyltransferase^#gephebase-summary-title)

Entry Status

Published

GepheID

GP00000023

Main curator

Martin

PHENOTYPIC CHANGE

Trait Category

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

Trait

ABO antigen blood type (https://www.gephebase.org/search-criteria?/and+Trait=^ABO antigen blood type^#gephebase-summary-title)

Trait State in Taxon A

Pan troglodytes - blood group A

Trait State in Taxon B

Pan troglodytes - allele OdeI

Ancestral State

Data not curated

Taxonomic Status

Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name

Pan troglodytes (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Pan troglodytes^#gephebase-summary-title)

Common Name

chimpanzee

Synonyms

chimpanzee; Chimpansee troglodytes

Rank

species

Lineage

cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae; Homininae; Pan

Parent

Pan (chimpanzees) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9596)

NCBI Taxonomy ID

9598 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9598)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Pan troglodytes (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Pan troglodytes^#gephebase-summary-title)

Common Name

chimpanzee

Synonyms

chimpanzee; Chimpansee troglodytes

Rank

species

Lineage

cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires; Primates; Haplorrhini; Simiiformes; Catarrhini; Hominoidea; Hominidae; Homininae; Pan

Parent

Pan (chimpanzees) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9596)

NCBI Taxonomy ID

9598 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9598)

is Taxon B an Infraspecies?

No

GENOTYPIC CHANGE

Generic Gene Name

ABO

Synonyms

GTB; NAGAT; A3GALNT; A3GALT1

String

-

Sequence Similarities

Belongs to the glycosyltransferase 6 family.

GO - Molecular Function

GO:0003823 : antigen binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003823)
GO:0004381 : fucosylgalactoside 3-alpha-galactosyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004381)
GO:0004380 : glycoprotein-fucosylgalactoside alpha-N-acetylgalactosaminyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004380)
GO:0030145 : manganese ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0030145)

UniProtKB Homo sapiens

P16442 (http://www.uniprot.org/uniprot/P16442)

GenebankID or UniProtKB

AFT65612 (https://www.ncbi.nlm.nih.gov/nuccore/AFT65612)

GO:0000166 : nucleotide binding (https://www.ebi.ac.uk/QuickGO/term/GO:0000166)
GO:0016757 : transferase activity, transferring glycosyl groups
(https://www.ebi.ac.uk/QuickGO/term/GO:0016757)

GO - Biological Process

GO:0005975 : carbohydrate metabolic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0005975)
GO:0030259 : lipid glycosylation (https://www.ebi.ac.uk/QuickGO/term/GO:0030259)
GO:0006486 : protein glycosylation (https://www.ebi.ac.uk/QuickGO/term/GO:0006486)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)
GO:0005794 : Golgi apparatus (https://www.ebi.ac.uk/QuickGO/term/GO:0005794)
GO:0032580 : Golgi cisterna membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0032580)
GO:0031982 : vesicle (https://www.ebi.ac.uk/QuickGO/term/GO:0031982)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Uncertain; possibly 9bp deletion resultin in 3a.a. deletion

Experimental Evidence

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

Main Reference

Comparison of allele O sequences of the human and non-human primate ABO system. (1999) (https://pubmed.ncbi.nlm.nih.gov/10380696)

Authors

Kermarrec N; Roubinet F; Apoil PA; Blancher A

Abstract

Like humans, non-human primates express the antigens A and B of the ABO histoblood group system. In chimpanzees, only A and O types are found, while the types A, B, AB, and O are found in macaques. The sequences of exons 6 and 7 of two chimpanzee O alleles (Odel and O(x), two macaque species O alleles (rhesus monkey and crab-eating macaque), and sequences of exon 7 of two major chimpanzee A alleles (A1ch and A2ch) were established. The sequences of cDNAs corresponding to the chimpanzee and rhesus monkey O alleles were characterized from exon 1 to 7 and from exon 4 to 7, respectively. A comparison of our results with ABO gene sequences already published by others demonstrates that human and non-human primate O alleles are species-specific and result from independent silencing mutations. These observations reinforce the hypothesis that the maintenance of the ABO gene polymorphism in primates reflects convergent evolution more than transpecies inheritance of ancestor alleles.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^ABO histo blood group glycosyltransferase^/and+Taxon ID=^9598^/or+Gene Gephebase=^ABO histo blood group glycosyltransferase^/and+Taxon ID=^9598^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS