GEPHE SUMMARY

Gephebase Gene
SGLT1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^SGLT1^#gephebase-summary-title)

GepheID
GP00001037

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Canis lupus

Trait State in Taxon B
Canis familiaris

Ancestral State
Data not curated

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

Taxon A

Latin Name
Canis lupus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Canis lupus^#gephebase-summary-title)

Common Name
gray wolf

Synonyms
gray wolf; grey wolf; Canis lupus Linnaeus, 1758

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; Laurasiatheria; Carnivora; Caniformia; Canidae; Canis

Parent
Canis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9611)

NCBI Taxonomy ID
9612 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9612)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Canis lupus familiaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Canis lupus familiaris^#gephebase-summary-title)

Common Name
dog

Synonyms
Canis canis; Canis domesticus; Canis familiaris; dog; dogs; Canis familiaris Linnaeus, 1758; Canis lupus familiaris Linnaeus, 1758

Rank
subspecies

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Laurasiatheria; Carnivora; Caniformia; Canidae; Canis; Canis lupus

Parent
Canis lupus (gray wolf) - (Rank: species) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9612)

NCBI Taxonomy ID
9615 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 9615)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
Slc5a1

Synonyms
Sglt1

String
-

Sequence Similarities
Belongs to the sodium:solute symporter (SSF) (TC 2.A.21) family.

GO - Molecular Function
GO:0005412 : glucose:sodium symporter activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005412)

GO - Biological Process
-

GO - Cellular Component
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0016324 : apical plasma membrane

UniProtKB Mus musculus
Q9QXI6 (http://www.uniprot.org/uniprot/Q9QXI6)

GenebankID or UniProtKB
AAV41055 (https://www.ncbi.nlm.nih.gov/nuccore/AAV41055)

(https://www.ebi.ac.uk/QuickGO/term/GO:0016324)
GO:0005911 : cell-cell junction (https://www.ebi.ac.uk/QuickGO/term/GO:0005911)
GO:0031526 : brush border membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0031526)

Presumptive Null

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#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

unknown

Experimental Evidence

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

Main Reference

The genomic signature of dog domestication reveals adaptation to a starch-rich diet. (2013) (https://pubmed.ncbi.nlm.nih.gov/23354050)

Authors

Axelsson E; Ratnakumar A; Arendt ML; Maqbool K; Webster MT; Perloski M; Liberg O; Arnemo JM; Hedhammar A; Lindblad-Toh K

Abstract

The domestication of dogs was an important episode in the development of human civilization. The precise timing and location of this event is debated and little is known about the genetic changes that accompanied the transformation of ancient wolves into domestic dogs. Here we conduct whole-genome resequencing of dogs and wolves to identify 3.8 million genetic variants used to identify 36 genomic regions that probably represent targets for selection during dog domestication. Nineteen of these regions contain genes important in brain function, eight of which belong to nervous system development pathways and potentially underlie behavioural changes central to dog domestication. Ten genes with key roles in starch digestion and fat metabolism also show signals of selection. We identify candidate mutations in key genes and provide functional support for an increased starch digestion in dogs relative to wolves. Our results indicate that novel adaptations allowing the early ancestors of modern dogs to thrive on a diet rich in starch, relative to the carnivorous diet of wolves, constituted a crucial step in the early domestication of dogs.

Additional References

RELATED GEPHE

Related Genes

2 (amylase 2B (AMY2B), MGAM) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^9612^/and+Trait=Starch processing/or+Taxon ID=^9615^/and+Trait=Starch processing/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS