

SRGAP2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~SRGAP2^#gephebase-summary-title)	Gephebase Gene	GP00001077	GepheID
Published	Entry Status	Martin	Main curator

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title)		Trait Category
Neuronal maturation (https://www.gephebase.org/search-criteria?/and+Trait=~Neuronal+maturation^#gephebase-summary-title)		Trait
Homo sapiens		Trait State in Taxon A
Primates		Trait State in Taxon B
Data not curated		Ancestral State
Intergeneric or Higher (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intergeneric+or+Higher^#gephebase-summary-title)		Taxonomic Status
Taxon A	Taxon B	
Homo sapiens (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Homo+sapiens^#gephebase-summary-title)	Primates (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Primates^#gephebase-summary-title)	Latin Name
human	-	Common Name
human; man; Homo sapiens Linnaeus, 1758; Home sapiens; Homo sampiens; Homo sapeins; Homo sapien; Homo sapians; Homo sapien; Homo sapience; Homo sapiense; Homo sapients; Homo sapines; Homo spaiens; Homo spiens; Humo sapiens	Primata; Primates Linnaeus, 1758	Synonyms
species	order	Rank
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; Homo	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Sarcopterygii; Dipnotetrapodomorpha; Tetrapoda; Amniota; Mammalia; Theria; Eutheria; Boreoeutheria; Euarchontoglires	Lineage
Homo () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9605)	Euarchontoglires () - (Rank: superorder) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=314146)	Parent
9606 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9606)	9443 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=9443)	NCBI Taxonomy ID
No	No	is Taxon B an Intraspecies?
is Taxon A an Intraspecies?		

Srgap2	Generic Gene Name	UniProtKB Mus musculus
	Synonyms	Q91Z67 (http://www.uniprot.org/uniprot/Q91Z67)
FBP2; Fnbp2; srGAP3; AI448945; 9930124L22Rik; Fbp27	String	GenebankID or UniProtKB
10090.ENSMUSP00000095195 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=10090.ENSMUSP00000095195)		
-	Sequence Similarities	
	GO - Molecular Function	
GO:0042802 : identical protein binding (https://www.ebi.ac.uk/QuickGO/term/GO:0042802)		
GO:0042803 : protein homodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0042803)		

GO:0005096 : GTPase activator activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005096>)
GO:0048365 : Rac GTPase binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0048365>)
GO - Biological Process
GO:0007165 : signal transduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007165>)
GO:0043547 : positive regulation of GTPase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043547>)
GO:0060996 : dendritic spine development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0060996>)
GO:0030336 : negative regulation of cell migration
(<https://www.ebi.ac.uk/QuickGO/term/GO:0030336>)
GO:0051014 : actin filament severing (<https://www.ebi.ac.uk/QuickGO/term/GO:0051014>)
GO:0021816 : extension of a leading process involved in cell motility in cerebral cortex radial glia guided migration (<https://www.ebi.ac.uk/QuickGO/term/GO:0021816>)
GO:0046847 : filopodium assembly (<https://www.ebi.ac.uk/QuickGO/term/GO:0046847>)
GO:0003363 : lamellipodium assembly involved in ameboidal cell migration
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003363>)
GO:2001223 : negative regulation of neuron migration
(<https://www.ebi.ac.uk/QuickGO/term/GO:2001223>)
GO:0048812 : neuron projection morphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048812>)
GO:0034446 : substrate adhesion-dependent cell spreading
(<https://www.ebi.ac.uk/QuickGO/term/GO:0034446>)

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:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0005654 : nucleoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005654>)
GO:0030054 : cell junction (<https://www.ebi.ac.uk/QuickGO/term/GO:0030054>)
GO:0030027 : lamellipodium (<https://www.ebi.ac.uk/QuickGO/term/GO:0030027>)
GO:0045211 : postsynaptic membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045211>)
GO:0014069 : postsynaptic density (<https://www.ebi.ac.uk/QuickGO/term/GO:0014069>)
GO:0044327 : dendritic spine head (<https://www.ebi.ac.uk/QuickGO/term/GO:0044327>)
GO:0005743 : mitochondrial inner membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005743>)
GO:0045335 : phagocytic vesicle (<https://www.ebi.ac.uk/QuickGO/term/GO:0045335>)

No (<a #gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive Null=" no"="">https://www.gephebase.org/search-criteria?/and+Presumptive Null="No" #gephebase-summary-title)	Presumptive Null
Gene Amplification (<a #gephebase-summary-title"="" amplification"="" gene="" href="https://www.gephebase.org/search-criteria?/and+Molecular Type=">https://www.gephebase.org/search-criteria?/and+Molecular Type="Gene Amplification" #gephebase-summary-title)	Molecular Type
Complex Change (<a #gephebase-summary-title"="" change"="" complex="" href="https://www.gephebase.org/search-criteria?/and+Aberration Type=">https://www.gephebase.org/search-criteria?/and+Aberration Type="Complex Change" #gephebase-summary-title)	Aberration Type
Partial duplications (negative alleles)	Molecular Details of the Mutation
Candidate Gene (<a #gephebase-summary-title"="" candidate="" gene"="" href="https://www.gephebase.org/search-criteria?/and+Experimental Evidence=">https://www.gephebase.org/search-criteria?/and+Experimental Evidence="Candidate Gene" #gephebase-summary-title)	Experimental Evidence
Inhibition of SRGAP2 function by its human-specific paralogs induces neoteny during spine maturation. (2012) (https://pubmed.ncbi.nlm.nih.gov/22559944)	Main Reference
Charrier C; Joshi K; Coutinho-Budd J; Kim JE; Lambert N; de Marchena J; Jin WL; Vanderhaeghen P; Ghosh A; Sassa T; Polleux F	Authors

Abstract
Structural genomic variations represent a major driving force of evolution, and a burst of large segmental gene duplications occurred in the human lineage during its separation from nonhuman primates. SRGAP2, a gene recently implicated in neocortical development, has undergone two human-specific duplications. Here, we find that both duplications (SRGAP2B and SRGAP2C) are partial and encode a truncated F-BAR domain. SRGAP2C is expressed in the developing and adult human brain and dimerizes with ancestral SRGAP2 to inhibit its function. In the mouse neocortex, SRGAP2 promotes spine maturation and limits spine density. Expression of SRGAP2C phenocopies SRGAP2 deficiency. It underlies sustained radial migration and leads to the emergence of human-specific features, including neoteny during spine maturation and increased density of longer spines. These results suggest that inhibition of SRGAP2 function by its human-specific paralogs has contributed to the evolution of the human neocortex and plays an important role during human brain development.

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Evolution of human-specific neural SRGAP2 genes by incomplete segmental duplication. (2012) (https://pubmed.ncbi.nlm.nih.gov/22559943)	Additional References
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RELATED GEPHE

No matches found.	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

