

# **R4 regulators of G protein signaling (RGS) identify a conserved genomic region that contains MHC-related markers**

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## Online Resource 1.

This file consists of several parts to complement Figure 1.

**Online Resource 1A** contains links to PhylomeDB entries (<http://phylomedb.org/>) for the human RGS1/RGS16 region genes, which can provide some evidence for the orthology relationships shown on Figure 1.

**Online Resource 1B** contains a Maximum Likelihood phylogeny constructed with 1000 bootstrap replicates for the NOTCH2 genes from human, mouse, anole lizard, chicken, frog, medaka and stickleback. This provides the phylogenetic evidence to make claims about the location of NOTCH2 gene in several species of Figure 1 as NOTCH contains many EGF repeats in addition to NOTCH domain itself.

**Online Resource 1C** contains a Maximum Likelihood phylogeny constructed with 1000 bootstrap replicates for the R4 RGS genes found in human, mouse, anole lizard, chicken, frog, medaka, stickleback and one additional sequence from the amphioxus *Branchiostoma floridae*. This tree shows that the RGS genes indicated on Figure 1 are indeed all related to the R4 RGS genes on human chromosome 1.

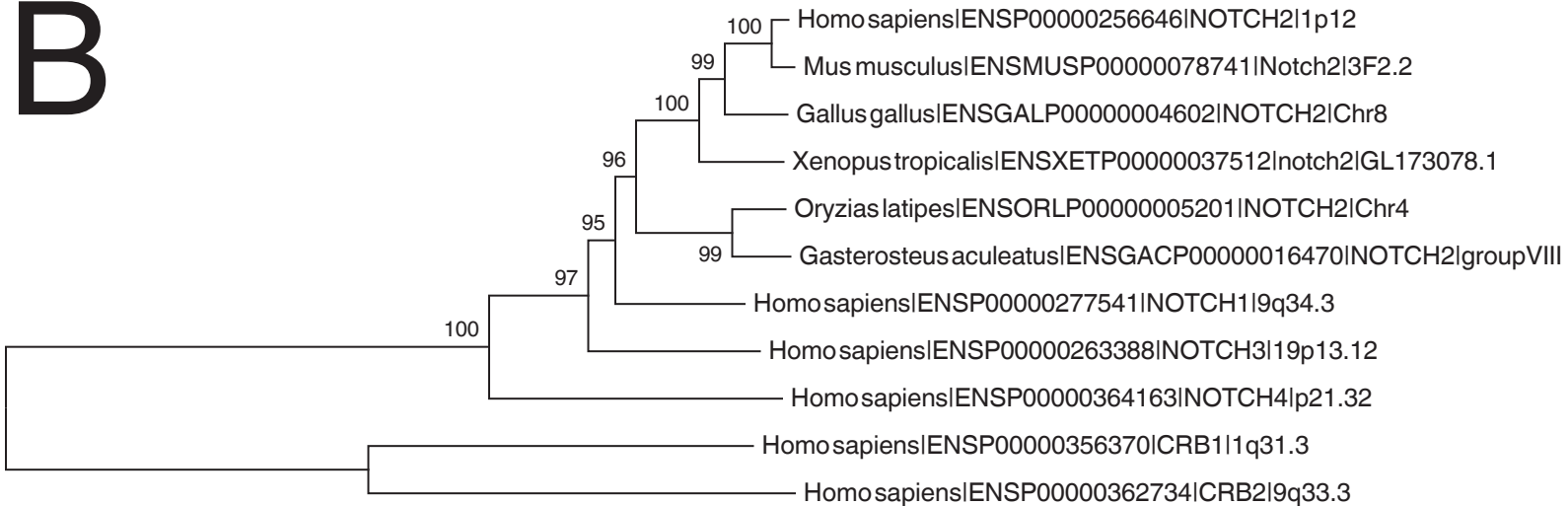
**Online Resource 1D** shows the Genomicus Phyloview centered on Homo sapiens MR1, as MR1 has too many co-orthologs in some species to fit on Figure 1.

**Online Resource 1A.** PhylomeDB (<http://phylomedb.org/>)  
phylogenies for human RGS1/RGS16 region genes

Gene name	Link to PhylomeDB
NEK7	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=nek7">http://phylomedb.org/?q=search_tree&amp;seqid=nek7</a>
LHX9	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=lxh9">http://phylomedb.org/?q=search_tree&amp;seqid=lxh9</a>
C1orf53	-
DENND1B	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zbt">http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zbt</a>
CRB1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=crb1">http://phylomedb.org/?q=search_tree&amp;seqid=crb1</a>
ZBTB41	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zbp">http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zbp</a>
ASPM	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=aspm">http://phylomedb.org/?q=search_tree&amp;seqid=aspm</a>
F13B	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=f13b">http://phylomedb.org/?q=search_tree&amp;seqid=f13b</a>
CFHR5	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfhr5">http://phylomedb.org/?q=search_tree&amp;seqid=cfhr5</a>
CFHR2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfhr2">http://phylomedb.org/?q=search_tree&amp;seqid=cfhr2</a>
CFHR4	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfhr4">http://phylomedb.org/?q=search_tree&amp;seqid=cfhr4</a>
CFHR1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfhr1">http://phylomedb.org/?q=search_tree&amp;seqid=cfhr1</a>
CFHR3	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfhr3">http://phylomedb.org/?q=search_tree&amp;seqid=cfhr3</a>
CFH	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cfh">http://phylomedb.org/?q=search_tree&amp;seqid=cfh</a>
KCNT2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=kcnt2">http://phylomedb.org/?q=search_tree&amp;seqid=kcnt2</a>
B3GALT2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NTD">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NTD</a>
CDC73	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NTC">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NTC</a>
GLRX2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=glrx2">http://phylomedb.org/?q=search_tree&amp;seqid=glrx2</a>
TROVE2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=TROVE2">http://phylomedb.org/?q=search_tree&amp;seqid=TROVE2</a>
UCHL5	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=uchl5">http://phylomedb.org/?q=search_tree&amp;seqid=uchl5</a>
RGS2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgs13">http://phylomedb.org/?q=search_tree&amp;seqid=rgs13</a>
RGS13	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgs13">http://phylomedb.org/?q=search_tree&amp;seqid=rgs13</a>
RGS1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zb1">http://phylomedb.org/?q=search_tree&amp;seqid=phy0007zb1</a>
RGS21	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy001R7KT">http://phylomedb.org/?q=search_tree&amp;seqid=Phy001R7KT</a>
RGS18	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgs18">http://phylomedb.org/?q=search_tree&amp;seqid=rgs18</a>
FAM5C	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=fam5c">http://phylomedb.org/?q=search_tree&amp;seqid=fam5c</a>
PLA2G4A	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=pla2g4a">http://phylomedb.org/?q=search_tree&amp;seqid=pla2g4a</a>
PTGS2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=ptgs2">http://phylomedb.org/?q=search_tree&amp;seqid=ptgs2</a>
PDC	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=pcd">http://phylomedb.org/?q=search_tree&amp;seqid=pcd</a>
OCLM	-
C1orf27	-
TPR	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAR">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAR</a>
PRG4	-
HMCN1	-
IVNS1ABP	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy000CDR4">http://phylomedb.org/?q=search_tree&amp;seqid=Phy000CDR4</a>
SWT1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=swt1">http://phylomedb.org/?q=search_tree&amp;seqid=swt1</a>
TRMT1L	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NUL">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NUL</a>
RNF2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rnf2">http://phylomedb.org/?q=search_tree&amp;seqid=rnf2</a>
FAM129A	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=fam129a">http://phylomedb.org/?q=search_tree&amp;seqid=fam129a</a>
EDEM3	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAH">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAH</a>
C1orf21	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=c1orf21">http://phylomedb.org/?q=search_tree&amp;seqid=c1orf21</a>
TSEN15	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAF">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAF</a>
GLT25D2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAD">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007ZAD</a>
APOBEC4	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=apobec4">http://phylomedb.org/?q=search_tree&amp;seqid=apobec4</a>
RGL1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgl1">http://phylomedb.org/?q=search_tree&amp;seqid=rgl1</a>
ARPC5	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=arpc5">http://phylomedb.org/?q=search_tree&amp;seqid=arpc5</a>
NCF2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=ncf2">http://phylomedb.org/?q=search_tree&amp;seqid=ncf2</a>

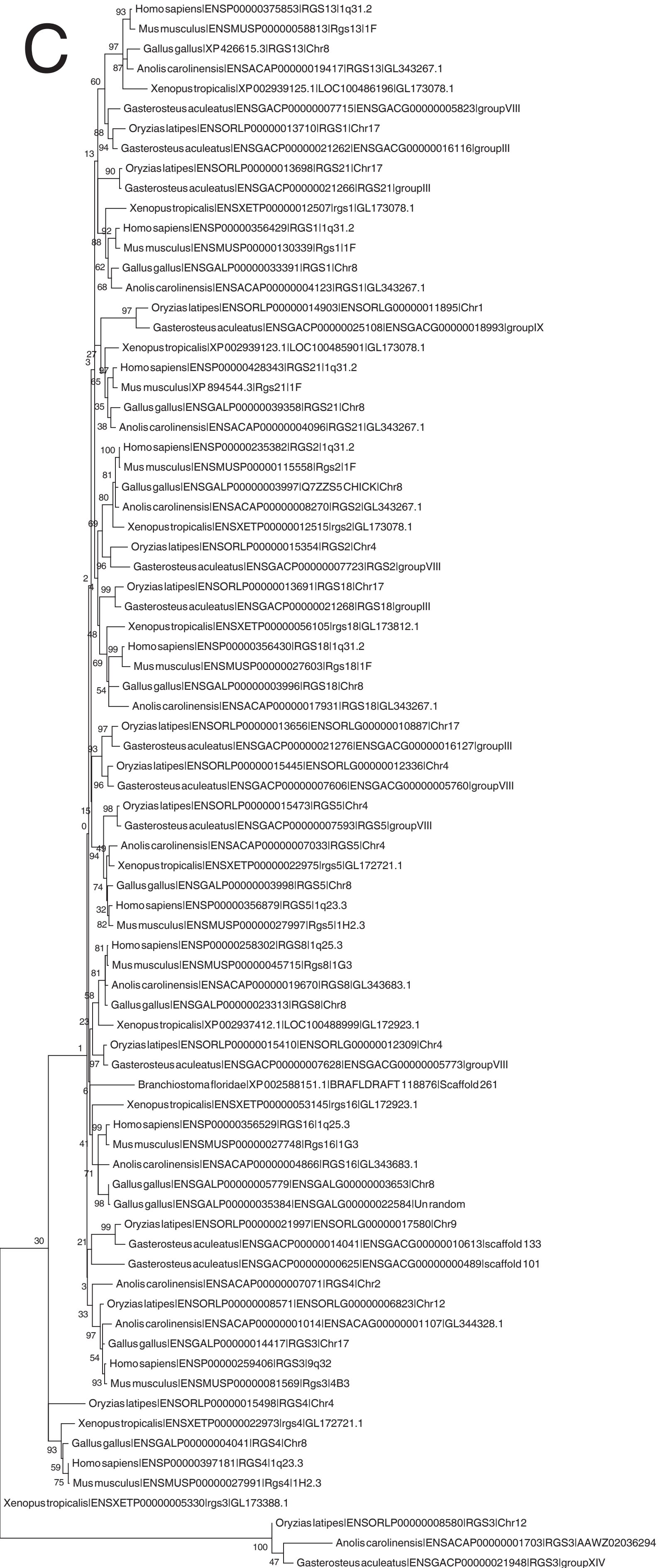
Gene name	Link to PhylomeDB
SMG7	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=smg7">http://phylomedb.org/?q=search_tree&amp;seqid=smg7</a>
NMNAT2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=nmnat2">http://phylomedb.org/?q=search_tree&amp;seqid=nmnat2</a>
LAMC2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=lamc2">http://phylomedb.org/?q=search_tree&amp;seqid=lamc2</a>
LAMC1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=lamc1">http://phylomedb.org/?q=search_tree&amp;seqid=lamc1</a>
SHCBP1L	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=phy0007z9z">http://phylomedb.org/?q=search_tree&amp;seqid=phy0007z9z</a>
DHX9	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9Y">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9Y</a>
NPL	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=np1">http://phylomedb.org/?q=search_tree&amp;seqid=np1</a>
RGS8	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgs8">http://phylomedb.org/?q=search_tree&amp;seqid=rgs8</a>
RGS16	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rgs16">http://phylomedb.org/?q=search_tree&amp;seqid=rgs16</a>
RNASEL	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=rnasel">http://phylomedb.org/?q=search_tree&amp;seqid=rnasel</a>
RGSL1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9R">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9R</a>
TEDDM1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NVK">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NVK</a>
GLUL	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NVM">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0009NVM</a>
ZNF648	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy00089UL">http://phylomedb.org/?q=search_tree&amp;seqid=Phy00089UL</a>
CACNA1E	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9O">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9O</a>
IER5	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=ier5">http://phylomedb.org/?q=search_tree&amp;seqid=ier5</a>
MR1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=mr1">http://phylomedb.org/?q=search_tree&amp;seqid=mr1</a>
STX6	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=stx6">http://phylomedb.org/?q=search_tree&amp;seqid=stx6</a>
AL162431.1	-
KIAA1614	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9E">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z9E</a>
XPR1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=XPR1">http://phylomedb.org/?q=search_tree&amp;seqid=XPR1</a>
ACBD6	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=acbd6">http://phylomedb.org/?q=search_tree&amp;seqid=acbd6</a>
LHX4	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=lx4">http://phylomedb.org/?q=search_tree&amp;seqid=lx4</a>
QSOX1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z98">http://phylomedb.org/?q=search_tree&amp;seqid=Phy0007Z98</a>
CEP350	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=cep350">http://phylomedb.org/?q=search_tree&amp;seqid=cep350</a>
TOR1AIP1	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=tor1aip1">http://phylomedb.org/?q=search_tree&amp;seqid=tor1aip1</a>
AL359853.2	-
TOR1AIP2	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=tor1aip2">http://phylomedb.org/?q=search_tree&amp;seqid=tor1aip2</a>
FAM163A	<a href="http://phylomedb.org/?q=search_tree&amp;seqid=fam163a">http://phylomedb.org/?q=search_tree&amp;seqid=fam163a</a>

# B



0.5

C



0.5

D

