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Gene Section
Mini Review

RASL11B (RAS-like, family 11, member B)

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Identity

Other names: MGC2827; MGC4499

HGNC (Hugo): RASL11B

Location: 4q12

Local order: Chr4:53,423,252-53,427,759 on the + strand.

Note:

Mouse: chr5:74,591,351-74,595,502 (according to Mouse July 2007 Assembly).

Rat: chr14:36,392,946-36,397,168 (according to Rat November 2004 Assembly).

Zebrafish: chr20:59,670,592-59,673,835 (according to Zebrafish March 2006 Assembly).

DNA/RNA

Description

Gene: 4508 bp

Chromosome: 4q12

mRNA: 1979 bp

Exon 1: 1-333

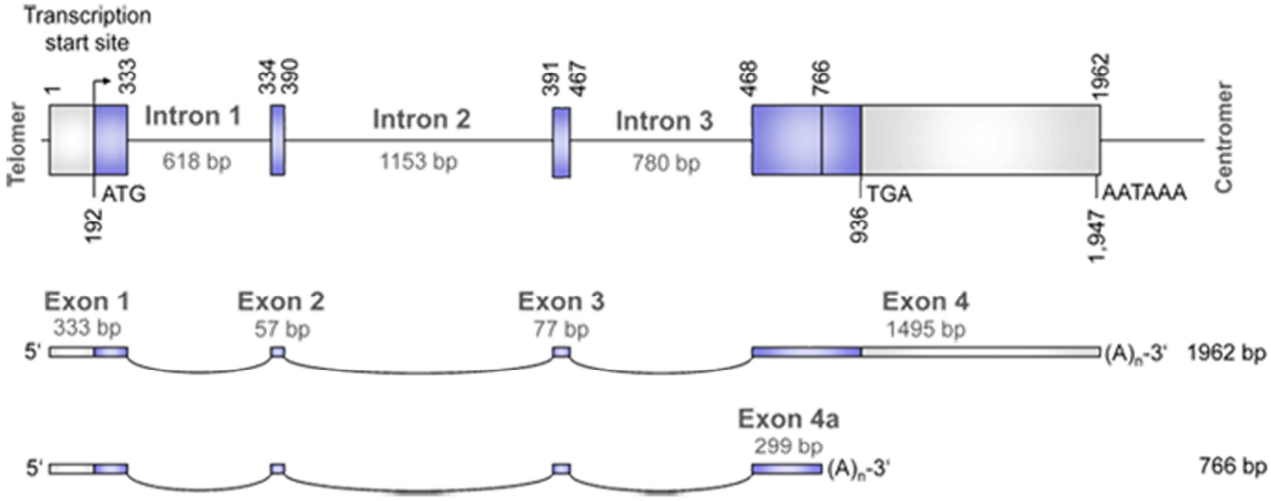
Exon 2: 334-390

Exon 3: 391-467

Exon 4: 468-1962

CDS: 192-936

The human RASL11B gene spans about 4508 bp on chromosome 4q12 and comprises 4 exons encoding at least 2 different transcripts.



Schematic representation of human RASL11B mRNAs and genomic organization of the human RASL11B gene. The human RASL11B gene consists of 4 exons encoding a transcript with a total length of 1962 bp. One shorter variant with a length of 766 bp was found. The ATG start and TGA stop codons are located in exons 1 and 4, respectively.

Exons of the RASL11B gene are 333 bp (exon 1), 57 bp (exon 2), 77 bp (exon 3), and 1495 bp (exon 4) in size. Sizes of introns are 618 bp (intron 1), 1153 bp (intron 2), and 780 bp (exon 3). All splice sites have canonical boundaries, starting the intron with 'gt' and ending with 'ag'.

A polyadenylation signal in the untranslated region of exon 4 is located at nucleotide position 1947.

Transcription

In addition to the full-length RASL11B transcript, a truncated polyadenylated transcript of 766 bp was reported.

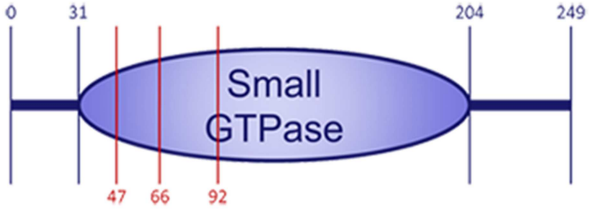
Full-length transcript: 1962 bp mRNA, 744 bp open reading frame.

Truncated transcript: 766 bp mRNA, 574 bp open reading frame.

Pseudogene

No pseudogenes reported.

Protein



Domains within the human RASL11B protein. Domains positions are indicated with vertical purple lines and intron positions are indicated with vertical red lines both showing the exact position in the polypeptide sequence.

Description

RASL11B is a 248 amino acid protein containing a characteristic RAS GTPase domain with typical topology of a six-stranded beta-sheet surrounded by five alpha-helices. The RASL11B protein has no typical prenylation signal, indicating that it is probably not anchored to cellular membranes.

Expression

Expression of human RASL11B mRNA was investigated in 37 tissues and 5 cell types. In tissues, RASL11B transcript is widely expressed with highest levels in placenta. In cells RASL11B transcript shows highest abundance in primary macrophages.

Localisation

Cytosolic.

Function

Small GTPase belonging to a Ras subfamily of putative tumor suppressor genes.

Homology

The protein sequence of the RASL11 protein family is highly conserved within different species and contains five conserved regions motives that comprise the G-domain of small GTPases (P-loop, switch 1 and 2, G4 and G5 box).

Implicated in

Note

According to Stolle et al., RASL11B expression is induced during maturation of THP-1 monocytic cells into macrophages and in coronary artery smooth muscle cells after treatment with TGF-beta1 suggesting that RASL11B may play a role in developmental processes or in pathophysiologies such as inflammation or cancer.

Pezeron et al. demonstrated that Rasl11b modulates function of the EGF-CFC coreceptor one-eyed-pinhead (oep) in zebrafish independently of the TGFbeta/Nodal pathway, which is crucial for germ layer formation. Down regulation of Rasl11b partially rescued endodermal and prechordal plate defects of zygotic homozygous oep zebrafish mutants. Rasl11b inhibitory action was observed only in animals with oep-deficient backgrounds, suggesting that normal oep expression prevents function of Rasl11b. On the other hand, Rasl11b down regulation did not rescue mesendodermal defects in other Nodal pathway mutants.

References

Stolle K, Schnoor M, Fuellen G, Spitzer M, Cullen P, Lorkowski S. Cloning, genomic organization, and tissue-specific expression of the RASL11B gene. Biochim Biophys Acta. 2007 Jul-Aug;1769(7-8):514-24

Pézeron G, Lambert G, Dickmeis T, Strähle U, Rosa FM, Mourrain P. Rasl11b knock down in zebrafish suppresses one-eyed-pinhead mutant phenotype. PLoS One. 2008 Jan 16;3(1):e1434

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