

## Gene Section

### Short Communication

# RAP2A (RAP2A, member of RAS oncogene family)

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## Identity

**HGNC (Hugo):** RAP2A

**Location:** 13q34

## DNA/RNA

### Description

The gene contains 2 coding exons separated by a large (29,418 bp) intron covering a total of 30,065 bp on chromosome 13.

## Protein

### Description

Rap2 is a member of the Ras superfamily of monomeric GTPases, closely related to Ras. There are two isoforms, RAP2A and Rap2B that share 90% identity and are encoded by two different genes. Rap2 protein share 50% identity with Ras proteins, including

the regions involved in GDP/GTP binding (hence Rap2A has very similar biochemical properties to Ras), C-terminal CAAX domain leading to prenylation (farnesylation for Rap2A and geranylgeranylation in the case of Rap2B) and palmitoylation. The effector region of Rap2 is very similar to that of Ras proteins, yet Ras and Rap2 do share seem to share effectors.

### Expression

Ubiquitous ; higher in brain and hemopoietic tissues.

### Localisation

Plasma and/or intracellular membranes (endoplasmic reticulum).

### Function

Unknow.

### Homology

90% identical to Rap2B, 60% identical to Rap1, 50 % to Ras proteins.



G1 - G5 : domains involved in GDP/GTP binding and hydrolysis

G1 + G3 : involved in binding beta and gamma phosphates of GTP

G4 + G5 : involved in interaction with the guanine base

G2: involved in interaction with effectors, and with Mg<sup>2+</sup> ion

M1: polybasic or palmitoylation site

M2: prenylation site

## Mutations

### *Germinal*

Unknown.

## Implicated in

No implication in pathologies characterized so far.

## To be noted

### Note

See also RAP family.

## References

Pizon V, Chardin P, Lerosey I, Olofsson B, Tavitian A. Human cDNAs rap1 and rap2 homologous to the Drosophila gene Dras3 encode proteins closely related to ras in the 'effector' region. *Oncogene*. 1988 Aug;3(2):201-4

Béranger F, Tavitian A, de Gunzburg J. Post-translational processing and subcellular localization of the Ras-related Rap2 protein. *Oncogene*. 1991 Oct;6(10):1835-42

Lerosey I, Chardin P, de Gunzburg J, Tavitian A. The product of the rap2 gene, member of the ras superfamily. Biochemical characterization and site-directed mutagenesis. *J Biol Chem*. 1991 Mar 5;266(7):4315-21

Janoueix-Lerosey I, Pasheva E, de Tand MF, Tavitian A, de Gunzburg J. Identification of a specific effector of the small GTP-binding protein Rap2. *Eur J Biochem*. 1998 Mar 1;252(2):290-8

Ohba Y, Mochizuki N, Matsuo K, Yamashita S, Nakaya M, Hashimoto Y, Hamaguchi M, Kurata T, Nagashima K, Matsuda M. Rap2 as a slowly responding molecular switch in the Rap1 signaling cascade. *Mol Cell Biol*. 2000 Aug;20(16):6074-83

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