

## Gene Section

### Short Communication

# RAP1B (RAP1B, member of RAS oncogene family)

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## Identity

**HGNC (Hugo):** RAP1B

**Location:** 12q14

## DNA/RNA

### Description

The gene encompasses 7 coding exons covering 10779 bp on chromosome 12.

## Protein

### Description

Rap1 is a member of the Ras superfamily of monomeric GTPases, closely related to Ras. There are two isoforms, Rap1A and Rap1B that share 95% identity and are encoded by two different genes. Rap1 proteins share 50% identity with Ras proteins, including the regions involved in GDP/GTP binding (hence Rap1A has very similar biochemical properties to Ras), C-terminal CAAX domain leading to

prenylation (geranylgeranylation in the case of Rap1A), and effector region identical to that of Ras proteins causing Ras and Rap1 to share some potential effectors.

### Expression

Ubiquitous ; highest in platelets and neutrophils.

### Localisation

Rap1 is bound to membranes. In many cell types, it is found in a perinuclear compartment overlapping the Golgi. Rap1 proteins (A and B) are phosphorylated near the C-ter by cAMP-dependent protein kinase. This results in translocation of part of the Rap1 pool to the cytosol.

### Function

The function of Rap1 is still a matter of debate. Its overexpression is able to compete with the activation of Raf-1 by active Ras. Active Rap1B has been shown to activate the B-Raf kinase and the MEK-ERK cascade. In several cellular models, Rap1 has been shown to be involved in the regulation of integrin-mediated cell adhesion.



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

### **Homology**

98% identical to Rap1A, 60% identical to Rap2, 50 % to Ras proteins

### **Mutations**

#### **Germinal**

Unknown.

### **Implicated in**

No implication in pathologies characterized so far.

### **To be noted**

#### **Note**

See also RAP family.

### **References**

Bos JL, de Rooij J, Reedquist KA. Rap1 signalling: adhering to new models. *Nat Rev Mol Cell Biol.* 2001 May;2(5):369-77

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*This article should be referenced as such:*

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