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.

<table>
<thead>
<tr>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G5</th>
<th>M1</th>
<th>M2</th>
</tr>
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</table>

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 Mg2+ 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**


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This article should be referenced as such: