PTPRG (protein tyrosine phosphatase, receptor type, G)
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Identity
Hugo: PTPRG
Other names: HPTPG; PTPG; R-PTP-GAMMA; RPTPG
Location: 3p14.2

DNA/RNA
Description
The PTPRG gene is composed of 30 exons and is approximately 780 kb in size.

Transcription
The transcript length is 4338 bp. An alternatively spliced variant has been reported with a transcript length of 5655 bp.

Pseudogene
No pseudogenes have been reported.

Protein
Description
Amino acids: 1445. Molecular weight: 162058 Daltons. The PTPRG gene belongs to the receptor class 5 subfamily of the protein-tyrosine phosphatase family.

Expression
PTPRG is expressed in several tissues.

Localisation

Function
Involved in regulating signaling through ligand-controlled protein tyrosine dephosphorylation. The protein contains an extracellular carbonic anhydrase-like and fibronectin type III-like domain, a single transmembrane domain, and a cytoplasmic region with 2 tandem catalytic tyrosine phosphatase domains. Y2H, animal models.

Homology
PTPRG shares a PTP domain, involved in dephosphorylating phosphorylated tyrosine residues, with the other receptor-like protein tyrosine phosphatases. The PTPRG gene is conserved in vertebrates. The human and mouse (1442-amino acid) sequences share 95% identity at the amino acid level.

Mutations
Germinal
No germline mutations have been reported.

Somatic
8 different missense mutations in the PTPRG gene have been identified in colon carcinomas: C1082T (T361M), C1385T (A462V), C1541T (T514M), C1777T (R593W), A2864G (E955G), A2918G (Y973C), C3934T (R1312W) A3976G (I1326V). Loss of heterozygosity (LOH) of a region which includes the PTPRG locus has been shown in clear renal cell carcinoma, lung carcinoma and colon carcinoma.

Implicated in
Note: PTPRG has been considered a potential tumor suppressor gene based on its function, antagonizing activity of protein tyrosine kinases that often function as oncoproteins. Secondly, because it maps to a region of human chromosome 3, 3p21, that is frequently
deleted in renal cell carcinoma and Lung carcinoma. Thirdly, because PTPRG has been shown to harbor point mutations in a subset of colon carcinomas. Fourthly, because the PTPRG gene shows promoter hypermethylation in cutaneous T-cell lymphoma and melanoma. Finally, lower expression levels of PTPRG have been reported for a number of cancerous tissues including gastric cancer.

References


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